Fourth Edition

# Archaeology Essentials

## Theories/Methods/Practice

Colin Renfrew & Paul Bahn

Thames & Hudson

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With 303 illustrations

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First published in 2007 in paperback in the United States of America by Thames & Hudson Inc., 500 Fifth Avenue, New York, New York 10110

www.thamesandhudsonusa.com

Fourth edition 2018

Library of Congress Control Number 2014944450

Paperback: ISBN 978-0-500-84138-9
Not for Sale: ISBN 978-0-500-29372-0

Printed and bound in China by C & C Offset Printing Co. Ltd

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# Preface

*Archaeology Essentials* is designed for college students taking an introductory course in archaeology. It aims to convey some of the excitement of archaeology in the twenty-first century and to give students a concise and readable account of the ways in which modern archaeologists investigate and understand our remote past. Archaeologists usually make the headlines when they find something spectacular: in 2013, for example, the discovery of the skeleton of King Richard III of England, buried in what remained of the former Greyfriars church in Leicester, now a parking lot, created a sensation. Here were the remains of Richard "Crouchback" (the deformity in the spine clearly visible), the last English monarch to die in battle, at Bosworth Field in 1485. However, most archaeologists spend their time engaged in research that rarely makes the news, but is nevertheless vitally important for our understanding of the past.

Archaeology is still often a matter of the painstaking excavation of an ancient site, but today archaeologists can use new techniques that sometimes avoid the need for excavation altogether. Advances in science and computing, as well as in methods for analyzing and evaluating archaeological finds, mean that archaeologists can reach conclusions that would have been impossible just fifteen or twenty years ago.

This book will introduce students to the methods, new and old, used by archaeologists: from the traditional shovel and trowel to satellite imaging, laser-based mapping using LIDAR (Light Detection and Ranging), and ground-based remote sensing. New technology has affected the work of archaeologists in the laboratory as well as in the field: we cover, for example, the use of genetic evidence.

But the story of modern archaeology is not just about technology. There have been enormous advances in the questions archaeologists ask and in the assumptions and theoretical models they apply to archaeological evidence. Some questions, which an earlier generation of archaeologists might have considered closed, have now been opened up for new examination.

In other words, whatever the focus of an individual college course, it is our intention that students will find in this book an authoritative, concise, and clear explanation of modern archaeological practice.

## How to Use This Book

*Archaeology Essentials* is organized around the most important questions that archaeologists ask. **Chapter 1** looks at the history of archaeology, the kinds of questions asked by archaeologists in the past and the methods they used. In **Chapter 2** we ask the question What Is Left?: the evidence with which archaeologists work. **Chapter 3** examines the question Where?: archaeologists can learn a good deal from the context in which evidence is found, and have developed many techniques for locating and recovering evidence.

In **Chapter 4** the question is When?: how can we know whether something dates from a few hundred years or many thousands of years ago? **Chapter 5** examines the fascinating question of How Were Societies Organized?: the nature, scale, and analysis of past social organization and identity. In **Chapter 6** we look at the world in which ancient people lived: What Was the Environment and What Did They Eat? Technology was an important factor in changing both society and the lives of our ancestors, as were contact and trade with other ancient peoples: the key question for **Chapter 7** is How Were Artifacts Made, Used, and Distributed?

**Chapter 8** looks at the archaeology of people: What Were They Like? **Chapter 9** addresses some of the more difficult questions that contemporary archaeologists explore, for instance the ways ancient peoples thought about their world and issues of identity: in other words, What Did They Think? An equally difficult question is the subject of **Chapter 10**: Why Did Things Change? In **Chapter 11** we address the often controversial question Whose Past?: the past may be remote in time but it can be very relevant today if it touches on the beliefs, identity, and wishes of the descendants of those who lived long ago. Finally, in **Chapter 12** we look at both the practice of applied archaeology (a profession that now employs more people than the academic archaeology pursued in universities) and more generally: The Future of the Past. At the end of that chapter we also include a section on building a career in archaeology.

If you follow the questions examined in this book you will understand how archaeologists work, think, analyze, and seek to understand the past. You will also discover that not all questions can be answered, or perhaps that there might be more than one answer.

To help you understand how archaeology works, we have provided some special features in this book. Case studies in boxes, shaded in blue and featured throughout the text, show you archaeology in action and will help you understand the issues that archaeologists deal with in their research and fieldwork. Key Concept boxes summarize and review important concepts,

methods, or facts about archaeology. At the end of every chapter there is a summary to recap what you have read and a suggested reading list to guide you to the most important and helpful publications if you want to research any subject further. Archaeological terms in the text that are defined in the glossary are highlighted in bold (e.g. **excavation**) when they first occur in the book.

## New to This Edition

This new fourth edition of *Archaeology Essentials* has been updated throughout, to reflect recent advances in methodology, analysis, and understanding, and to highlight the importance of contemporary archaeological issues:

- In Chapter 1, the history of archaeology has been further opened up to new perspectives, with traditionally famous nineteenth-century male figures now balanced with neglected pioneering voices.
- The fast-developing field of digital data capture and 3D modeling is covered in Chapter 3 in a new section, "Excavating the Digital Age," with a particular focus on the potential offered by drone technology.
- The study of isotopes is illustrated with a new case study on the Norse settlement of Greenland in Chapter 6.
- The rapid progress of DNA analysis is reflected throughout this fourth edition, with expanded sections on ancient DNA (aDNA) in Chapters 8 and 10.
- In Chapter 11, the increasing threat posed to the material record by ideological extremism is examined through the destruction of Palmyra by so-called Islamic State (IS), alongside the Taliban's earlier demolition of the sandstone Buddhas at Bamiyan, Afghanistan.

In addition, this new edition of *Archaeology Essentials* includes a range of recent ground-breaking archaeological investigations, for instance the Cultural Resource Management (CRM) work conducted at Hohokam sites in Arizona, along with new and updated case studies on such sites as Mississippian Spiro in Oklahoma, the pyramids of Giza in Egypt, and Must Farm in eastern England.

## Student and Instructor Resources

Fully revised student and instructor materials for this fourth edition of *Archaeology Essentials* are found on the website to accompany the book: http://college.thameshudsonusa.com/college/archaeologyessentials4. Readers outside North America should email education@thameshudson.co.uk for further information. *Archaeology Essentials* is also available as an ebook.

### Resources for Students

Students benefit from a variety of resources designed to complement the knowledge and skills provided by *Archaeology Essentials*:

- **InQuizitive**, a powerful adaptive learning tool available for the first time in archaeology, and free to use with *Archaeology Essentials* at: http://digital.wwnorton.com/archess4. Developed specifically for introductory archaeology courses, this self-testing tool offers interactive, visually led questions that adapt to students' current knowledge.
- **Active Archaeology Notebook**, available free with purchase of a new copy of *Archaeology Essentials* by prior arrangement with your Norton sales rep. Written by a team of instructors from the SAA Curriculum Committee led by Leah McCurdy, each activity applies a key concept in archaeology and has been tried and tested in archaeology classrooms. Activities are accompanied by online guidance notes for instructors explaining how they can be linked to learning objectives, contribute to students' grades, and build fun and effective in-class activities.
- **Flashcards** of terminological definitions to aid students' learning.
- An online **glossary** that provides easy access to key terms.

### Resources for Instructors

Instructors who adopt this fourth edition of *Archaeology Essentials* can get free access to a range of tools to enhance teaching and learning:

- To create visually engaging lectures, the **Archaeology Global Gallery** offers instructors a collection of hundreds of images not included in the book, sourced from museums, Thames & Hudson archives, and from fellow archaeologists, all carefully categorized and captioned. It can be accessed at: http://college.thameshudsonusa.com/college/archaeologyessentials4.
- A range of **videos** exploring ancient sites and featuring interviews with Professor Colin Renfrew and Dr. Kelly Knudson on key topics in archaeology.
- A **test bank** with over 400 multiple choice, true/false, and essay questions.
- **PowerPoint lectures** to help structure and organize teaching.
- **Images** and **diagrams** from *Archaeology Essentials* as JPEGs and PowerPoints.

## Acknowledgments

We would like to express our thanks to all those who have provided feedback, reviewed sections of the book, or otherwise helped in the updating of the text and illustrations for this edition: David Aftandilian, Texas Christian University; Lynda Carroll, Binghampton University; Matt Douglass, University of Nebraska-Lincoln; Matthew Johnson, Northwestern University; Timothy Kaiser, Lakehead University; Daniel Kreutzer, Metropolitan State University; Matthew Liebmann, Harvard University; Pamela A. Maack, PhD, San Jacinto College-Central; Heather McKillop, Louisiana State University; C. Jill Minar, Fresno City College; Krysta Ryzewski, Wayne State University; Joshua Samuels, The Catholic University of America; and Michael J. Shott, University of Akron.

# 1

# Searching for the Past
## The History of Archaeology

**About 5300 years ago**, a forty-year-old man made his last journey on a mountain path in the European Alps. He lay undisturbed until his body was discovered in September 1991. Archaeologists were able to determine not only his age, but also the contents of his last meal: meat (probably ibex and venison), plants, wheat, and plums. The Iceman suffered from arthritis, and analysis of a fingernail showed that he had suffered serious illness before he died. At first it was thought that he died from exhaustion in a fog or blizzard. Later analysis, however, revealed what may be an arrowhead in his left shoulder and cuts on his hands, wrists, and ribcage, as well as a blow to the head, so he may well have died a violent death. These observations are just a sample of what archaeologists were able to learn about this long-dead man (see pp. 54–55).

The thrill of discovery and the ability of **archaeology** to reveal at least some of the secrets of our past have been the theme of many famous novels and movies, notably Steven Spielberg's *Indiana Jones* series. But although many discoveries in archaeology are far less spectacular than either the Iceman or those represented in fiction—perhaps a collection of broken pieces of pottery—these kinds of remains too can tell us a lot about the past, through careful collection and analysis of the evidence.

Archaeology is unique in its ability to tell us about the whole history of humankind from its beginnings more than 3 million years ago. Indeed, for more than 99 percent of that huge span of time, archaeology—the study of past **material culture**—is the only source of information. It is the only way that we can answer questions about the **evolution** of our species and the developments in **culture** and society that led to the emergence of the first civilizations and to the more recent societies that are founded upon them.

## Archaeology as a Discipline

Many archaeologists consider themselves as part of the broader discipline of **anthropology**. Anthropology in the most general sense is the study of humanity: our physical characteristics as animals, and our unique

The diversity of modern archaeology.

(Right) Urban archaeology: excavation of a Roman site in the heart of London.

(Below left) Working in the on-site archaeobotanical laboratory on finds from Çatalhöyük in Turkey.

(Below right) In the field in Siberia, an ethnoarchaeologist shares and studies the lives of modern Oroqen people, here making blood sausages from the intestines of a recently butchered reindeer.

(Right) Underwater archaeology: a huge Egyptian statue found in the now-submerged ruins of an ancient city near Alexandria.

(Below left) An Inca "mummy," now known as the "Ice Maiden," is lifted from her resting place high up on the Ampato volcano in Peru (see p. 56).

(Near left) Piecing together fragments of an elaborate mural from the early Maya site of San Bartolo in Guatemala.

(Below right) Archaeologists painstakingly excavate, record, and reconstruct some of the thousands of "terracotta warriors" at the tomb of the first emperor of China, near the city of Xi'an in Shaanxi province.

non-biological characteristics. Anthropology is thus a broad discipline—so broad that it is often broken down into different fields:

- **Physical** or **biological anthropology**: the study of human biological or physical characteristics and how they evolved.
- **Cultural** (or **social**) **anthropology**: the study of human culture and society.
- Linguistic anthropology: the study of how speech varies with social factors and over time.
- Archaeology: the study of former societies through the remains of their material culture and, in the case of such literate cultures as those of Mesopotamia or Mesoamerica, such written records as have survived.

Archaeologists who are interested in the societies of ancient Greece and Rome, their empires and neighboring territories, consider themselves Classical archaeologists. They study the material remains of the Greek and Roman worlds, but can also take into account the extensive written records (literature, history, official records, and so on) that survive.

Similarly, biblical archaeologists work in much the same way as anthropological archaeologists, but with reference to the events set out in the Bible. Like history, archaeology is concerned with documenting and understanding the human past, but archaeologists operate in a time frame much larger than the periods studied by historians. Conventional historical sources begin only with the introduction of written records in around 3000 BCE in Western Asia, and much later in most other parts of the world (not until 1788 CE in Australia, for example). The period before written records and history (meaning the study of the past using written evidence) is known as **prehistory**.

Although archaeologists spend much of their time studying **artifacts** and buildings, it is worth emphasizing that archaeology is about the study of humans and, in that sense, like history, it is a humanity. But although it uses written history, it differs from the study of written history in a fundamental way. Historical records make statements, offer opinions, and pass judgments (even if those statements and judgments themselves need to be interpreted). The objects that archaeologists discover, on the other hand, tell us nothing directly in themselves. It is *we* today who have to make sense of these things. In this respect the practice of archaeology is rather like a science. The scientist collects data, conducts experiments, formulates a hypothesis (a proposition to account for the data), tests the hypothesis against more data, and then devises a model (a description that seems best to summarize the pattern observed in the data). The archaeologist has to develop a picture of the past, just as the scientist has to develop a coherent view of the natural world. It is not found ready made.

Archaeology, in short, is a science as well as a humanity. That is one of its fascinations as a discipline: it reflects the ingenuity of the modern scientist as well as the modern historian. 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: archaeology is just as much about the analytical concepts of the archaeologist as the instruments in the laboratory. The illustrations on pp. 12–13 give some idea of the diversity of the work that a modern-day archaeologist might be involved in.

## The Important Questions

Because the evidence of archaeology cannot speak for itself, it is important that archaeologists ask the right questions of the evidence. If the wrong questions are asked, the wrong conclusions will be drawn. For example, early explanations of the unexplained mounds found east of the Mississippi River assumed that they could not have been built by the indigenous American peoples of the region; it was believed instead that the mounds had been built by a mythical and vanished race of Moundbuilders. As explained in more detail below (p. 18), Thomas Jefferson, later in his career the third President of the United States, decided to test this hypothesis against hard evidence and dug a trench across a mound on his property. He was able to show that the mound had been used as a burial place on many occasions and found no evidence that it could not have been built by the indigenous peoples. In other words, Jefferson asked questions about what the evidence suggested: he did not simply reach a conclusion that fitted his prejudices and assumptions.

Traditional approaches tended to regard the objective of archaeology mainly as reconstruction: piecing together the puzzle. But today it is not enough simply to recreate the material culture of remote periods: how people lived and how they exploited their environment. We also want to know *why* they lived that way, why they had certain patterns of behavior, and how their material culture came to take the form it did. We are interested, in short, in explaining change.

## Understanding the History of Archaeology

The history of archaeology is commonly seen as the history of great discoveries: the tomb of Tutankhamun in Egypt, the lost Maya cities of Mexico, the painted caves of the **Paleolithic**, such as Lascaux in France, or the remains of our human ancestors buried deep in the Olduvai Gorge in Tanzania. But even more than that it is the story of how we have come to look with fresh eyes at the material evidence for the human past, and with new methods to aid us in our task.

It is important to remember that just a century and a half ago, most well-read people in the Western world—where archaeology as we know it today was

first developed—believed that the world had been created only a few thousand years earlier (in the year 4004 BCE, according to the then-standard interpretation of the Bible), and that all that could be known of the remote past had to be gleaned from the earliest historians, notably those of the ancient Near East, Egypt, and Greece. There was no awareness that any kind of coherent history of the periods before the development of writing was possible at all.

But today we can indeed penetrate the depths of the remote past. This is not simply because new discoveries are being made. It is because we have learned to ask some of the right questions, and have developed some of the right methods for answering them. The material evidence of the archaeological record has been lying around for a long time. What is new is our awareness that the methods of archaeology can give us information about the past, even the prehistoric past (before the invention of writing). The history of archaeology is therefore in the first instance a history of ideas, of theory, of ways of looking at the past. Next it is a history of developing research methods, employing those ideas, and investigating those questions. And only thirdly is it a history of actual discoveries.

In this book it is the development of the questions and ideas that we shall emphasize, and the application of new research methods. The main thing to remember is that every view of the past is a product of its own time: ideas and theories are constantly evolving, and so are methods. When we describe the archaeological research methods of today we are simply speaking of one point on the trajectory of the subject's evolution. In a few decades' or even a few years' time these methods will certainly look old-fashioned and out of date. That is the dynamic nature of archaeology as a discipline.

## The First Searchers: The Speculative Phase

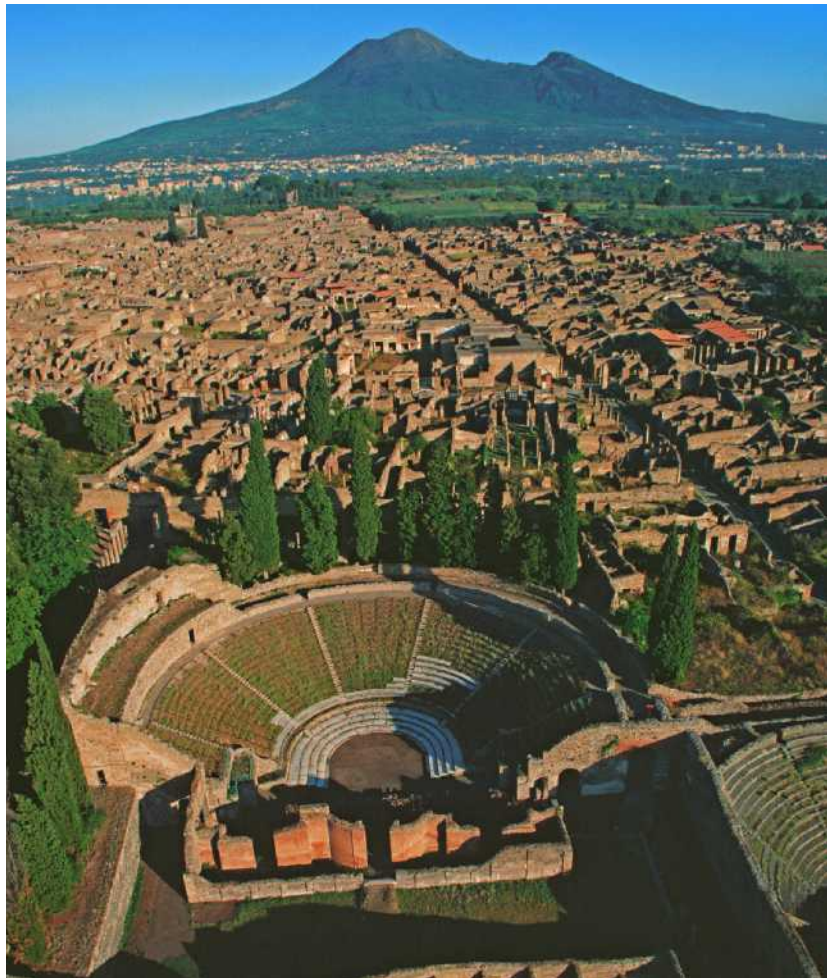
Humans have always speculated about their past, and most cultures have their own foundation myths to explain why society is how it is. Most cultures, too, have been fascinated by the societies that preceded them. The Aztecs exaggerated their Toltec ancestry, and were so interested in Teotihuacan—the huge Mexican city abandoned hundreds of years earlier, which they mistakenly linked with the Toltecs—that they incorporated ceremonial stone masks from that **site** in the foundation deposits of their own Great Temple. A rather more detached curiosity about the relics of bygone ages developed in several other early civilizations, where scholars and even rulers collected and studied objects from the past.

During the revival of learning in Europe known as the Renaissance (fourteenth to seventeenth centuries), princes and people of refinement began to form "cabinets of curiosities," in which curios and ancient artifacts were displayed rather haphazardly with exotic minerals and all manner of specimens illustrative of what was called "natural history." During the

Renaissance also, scholars began to study and collect the relics of ancient Greece and Rome. And they began too in more northern lands to study the local relics of their own remote past. At this time these were mainly the field monuments—those conspicuous sites, often made of stone, which immediately attracted attention, such as Stonehenge. Careful scholars, such as the Englishman William Stukeley, made systematic studies of some of these monuments, with accurate plans that are still useful today. Stukeley and his colleagues successfully demonstrated that these monuments had not been constructed by giants or devils, as suggested by such local names as the Devil's Arrows, but by people in antiquity. Stukeley was also successful in phasing field monuments, demonstrating that, since Roman roads intersected barrows, the former must have been built after the latter.

### The First Excavations

In the eighteenth century more adventurous researchers initiated **excavation** of some of the most prominent sites. The Roman city of Pompeii in Italy was one of the first of these. Buried under meters of volcanic ash after the cataclysmic eruption of nearby Mount Vesuvius, Pompeii was only



The Roman city of Pompeii lies in the shadow of Mount Vesuvius in Italy. When the volcano erupted in 79 CE, the entire city was buried, all but forgotten until excavations began in the mid-eighteenth century. Such spectacular discoveries generated huge interest in the past, and greatly influenced the arts.

## "The First Excavation"

Thomas Jefferson, later to become President of the United States, conducted the "first scientific excavation" in Virginia in 1784

By carefully digging a trench across a Native American burial mound, Jefferson was able to observe different layers and to draw reasoned conclusions from the data

rediscovered in 1748. Although to begin with the motivation of the excavators was to find valuable ancient masterpieces, it was not long before published finds from Pompeii were attracting enormous international attention, influencing **styles** of furniture and interior decoration, and even inspiring several pieces of romantic fiction. Not until 1860, however, did well-recorded excavations begin.

The credit for conducting what has been called "the first scientific excavation in the history of archaeology" traditionally goes to Thomas Jefferson, who in 1784 dug a trench or section across a burial mound on his property in Virginia. Jefferson's work marks the beginning of the end of the Speculative Phase.

In Jefferson's time people were speculating that the hundreds of unexplained mounds known east of the Mississippi River had been built not by the indigenous Americans, but by a mythical and vanished race of "Moundbuilders." Jefferson adopted what today we would call a scientific approach, that is, he tested ideas about the mounds against hard evidence—by excavating one of them. His methods were careful enough to allow him to recognize different layers (or **stratigraphy**) in his trench, and to see that the many human bones present were less well preserved in the lower layers. From this he deduced that the mound had been reused as a place of burial on many separate occasions. Although Jefferson admitted, rightly, that more evidence was needed to resolve the Moundbuilder question, he saw no reason why ancestors of the present-day Native Americans themselves could not have raised the mounds.

Jefferson was ahead of his time. 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 Sir Richard Colt Hoare, who dug into hundreds of burial mounds in southern Britain during the first decade of the nineteenth 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, which insisted on a short span for human existence.

## The Beginnings of Modern Archaeology

It was not until the middle of the nineteenth century that the discipline of archaeology became truly established. Already in the background there were the significant achievements of the newly developed science of geology. The study of the **stratification** of rocks (their arrangement in superimposed layers or strata) established principles that were to be the basis of archaeological excavation, as foreshadowed by Jefferson. It was demonstrated that the stratification of rocks was due to processes that were still going on in

(Above) Early excavations: Sir Richard Colt Hoare and William Cunnington direct a dig north of Stonehenge in 1805.

(Below) Charles Darwin caricatured as an ape, published in 1874. The drawing was captioned with a line from William Shakespeare's *Love's Labour's Lost*: "This is the ape of form."

seas, rivers, and lakes. This was the principle of **uniformitarianism**: that geologically ancient conditions were in essence similar to, or "uniform with," those of our own time, introduced by the great geologist Sir Charles Lyell. 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.

## The Antiquity of Humankind and the Concept of Evolution

These advances in geology did much to lay the groundwork for what was one of the most significant events in the intellectual history of the nineteenth century (and an indispensable one for the discipline of archaeology): the establishment of the antiquity of humankind. It had become widely agreed that Earth's origins extended far back into a remote past, so that the biblical notion of the creation of the world and all its contents just a few thousand years before our own time could no longer be accepted. The possibility of a prehistory of humankind, indeed the need for one, was established.

This harmonized well with the findings of Charles Darwin, whose fundamental work, *On the Origin of Species*, published in 1859, established the concept of evolution to explain the origin and development of all plants and animals. The idea of evolution itself was not new—earlier scholars had suggested that living things must have changed or evolved through the ages. What Darwin demonstrated was how this change occurred. The key mechanism was, in Darwin's words, "natural selection," or the survival of the fittest. In the struggle for existence, environmentally better-adapted individuals of a particular species would survive (or be "naturally selected"),

## Key Early Advances

The rejection of a literal interpretation of the biblical account of early human history and the establishment of the antiquity of humankind

Charles Darwin's theories of evolution and natural selection

The establishment of the Three Age System that divided prehistory into a Stone Age followed by a Bronze Age and an Iron Age

The development of archaeological field techniques

whereas less well-adapted ones would die. The surviving individuals would pass on their advantageous traits to their offspring and gradually the characteristics of a species would change to such an extent that a new species emerged. This was the process of evolution. The implications were clear: that the human species had emerged as part of this same process. The search for human origins in the material record, using the techniques of archaeology, could begin.

Darwin's work on evolution also had an immediate impact on archaeologists who were laying the foundations for the study of artifacts and how they develop over time. But his influence on social thinkers and anthropologists has been even more significant. The principles of evolution can also be applied to social organization, for culture can be seen as learned and passed on between generations, albeit in a more general way than in biological evolution.

### The Three Age System

As we have noted, some archaeological techniques, notably those in the field of excavation, were already being developed. So too was another conceptual device that proved very useful for the progress of European prehistory: the **Three Age System**. As early as 1808, Colt Hoare had recognized a sequence of stone, "brass," and iron artifacts within the barrows he excavated, but this was first systematically studied in the 1830s by the Danish scholar C.J. Thomsen. He proposed that prehistoric artifacts 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, where bronze was less important and iron was not in use before the European conquest. But it was conceptually significant. The Three Age System established the principle that by studying and classifying prehistoric artifacts, they could be ordered chronologically. 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. Although superseded by modern dating methods, the Three Age System remains one of the fundamental divisions of archaeological materials today.

### Ethnography and Archaeology

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 a useful starting point for archaeologists seeking to

understand something of the lifestyles of their own early native inhabitants, who clearly had comparably simple tools and crafts. For example, as early as the sixteenth century, contact with native communities in North America provided antiquarians and historians with models for tattooed images of Celts and Britons.

Soon ethnographers and anthropologists were themselves producing schemes of human progress. Strongly influenced by Darwin's ideas about evolution, the British anthropologist Edward Tylor and his American counterpart Lewis Henry Morgan 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 work was partly based on his great knowledge of living Native Americans.

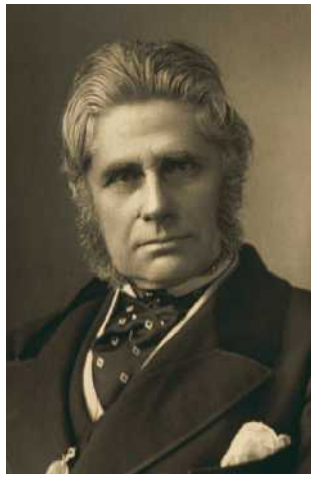
## Discovering the Early Civilizations

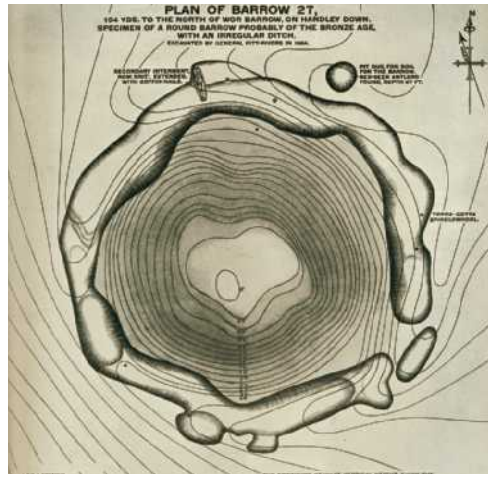
By the 1880s, then, many of the ideas underlying modern archaeology had been developed. But these ideas themselves took shape against a background of major nineteenth-century discoveries of ancient civilizations in the Old World and the New.

Frederick Catherwood's accurate, if somewhat romantic, drawing of a stela at Copan; at the time of his visit to the site, in 1840, Maya glyphs had not been deciphered.

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 parallel texts written in both Egyptian and Greek scripts. The Frenchman Jean-François Champollion used this bilingual inscription finally to decipher the hieroglyphs in 1822, after fourteen 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.

Egypt and the Near East also held a fascination for the American lawyer and diplomat John Lloyd Stephens, but it was in the New World that he was to make his name. His travels in Yucatan, Mexico, with the English artist Frederick Catherwood, and the superbly illustrated books they produced together in the early 1840s, revealed for the first time to an enthusiastic public the ruined cities of the ancient Maya. Unlike contemporary researchers in North America, who continued to argue for a vanished white race of Moundbuilders as the architects of the earthworks there, Stephens rightly believed that the Maya monuments were, in his own words, "the creation of the same races who inhabited the country at the time of the Spanish conquest." Stephens also noted that there were similar hieroglyphic inscriptions at the different sites, which led him to argue for Maya cultural unity—but no Champollion was to emerge to decipher the glyphs until the 1960s.






(Right) General Pitt-Rivers, excavator of Cranborne Chase, and pioneer in recording techniques.

(Far right) Pitt-Rivers's meticulous plan of a barrow on Cranborne Chase.

## The Development of Field Techniques

It was only in the late nineteenth century that a sound methodology of scientific excavation began to be generally adopted. From that time some major figures stand out, who in their various ways have helped create the modern field methods we use today.

General Augustus Lane-Fox Pitt-Rivers, for much of his life a professional soldier, brought long experience of military methods, survey, and precision to impeccably organized excavations on his estates in southern England. Plans, sections, and even models were made, and the exact position of every object was recorded. He was not concerned with retrieving beautiful treasures, but with recovering all objects, no matter how mundane. He was a pioneer in his insistence on total recording, and his four privately printed volumes, describing his excavations on Cranborne Chase from 1887 to 1898, represent the highest standards of archaeological publication.

A younger contemporary of Pitt-Rivers, Sir William Flinders Petrie was likewise noted for his meticulous excavations and his insistence on the collection and description of everything found, not just the fine objects, as well as on full publication. He employed these methods in his exemplary excavations in Egypt, and later in Palestine, from the 1880s until his death.

In 1937 Dorothy Garrod became the first woman professor in any subject at Cambridge, and probably the first woman prehistorian to achieve professorial status anywhere in the world. Her ground-breaking excavations at Zarzi in Iraq and Mount Carmel in Palestine provided the key to a large section of the Near East, from the Middle Paleolithic to the **Mesolithic**, and her find of the fossil skull of a Neanderthal child in 1925 became crucial to the understanding of the relationship between Neanderthals and *Homo sapiens*. And with her discovery of the Natufian culture, the predecessor of the world's first farming societies, she posed a series of new problems still not fully resolved today.

Dorothy Garrod, one of the first to study the prehistoric Near East systematically.

Flinders Petrie outside the tomb in which he lived in Giza, Egypt, in the early 1880s.

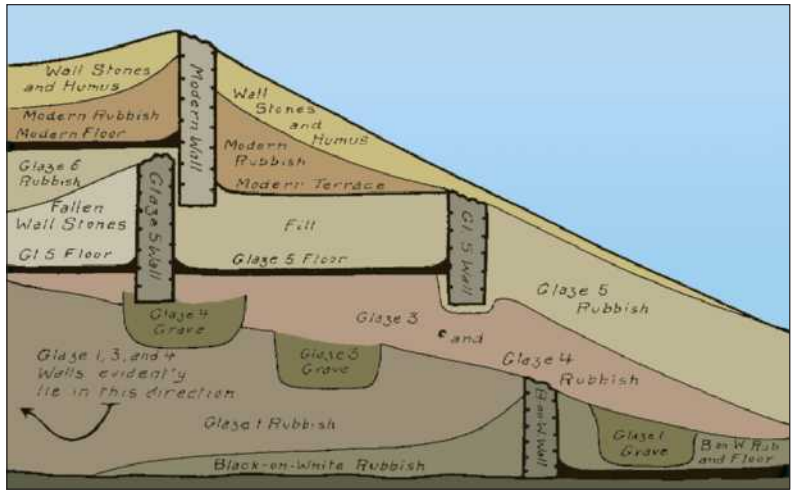
Sir Mortimer Wheeler fought in the British army in both world wars and, like Pitt-Rivers, brought military precision to his excavations, notably through such techniques as the grid-square method of dividing and digging a site. He is particularly well known for his work at British hillforts, notably Maiden Castle. Equally outstanding, however, was his achievement as Director-General of the Archaeological Survey of India, where he held training schools in modern field methods, and excavated at many important sites.

Sir Mortimer Wheeler (below), and his excavation at Arikamedu, India, in 1945 (right).

(Right) Kathleen Kenyon was a great excavator who worked at two of the most important and complex sites in the Near East, Jericho and Jerusalem.

(Below) Julio Tello, arguably the greatest Native American social scientist of the twentieth century—he was a Quechua Indian—and the father of Peruvian archaeology.

Alfred Kidder (below left) and his cross-sectional drawing of the stratigraphy at the Pecos pueblo site (below right).




Kathleen Kenyon trained on Roman sites in Britain under Sir Mortimer Wheeler, and adopted and developed his method, with its close control over stratigraphy. She subsequently applied this approach in the Near East at two of the most complex and most excavated sites in Palestine: Jericho and Jerusalem. At Jericho, in 1952–58, she found evidence that pushed back the date of occupation to the end of the Ice Age, and uncovered the walled village of the Neolithic farming community commonly referred to as "the earliest town in the world."

Julio Tello, "America's first indigenous archaeologist," was born and worked in Peru, began his career with studies in Peruvian linguistics, and qualified as a medical doctor before taking up anthropology. He did much to awaken an awareness of the archaeological heritage of Peru, and was the first to recognize the importance of the key site of Chavín de Huantar and indeed of such other major sites as Sechín Alto, Cerro Sechín, and Wari. He was one of the first to stress the autonomous rise of civilization in Peru, and he also founded the Peruvian National Museum of Archaeology.

Alfred Kidder was the leading Americanist of his time. As well as being a major figure in Maya archaeology, he was largely responsible for putting the Southwest on the archaeological map with his excavations at Pecos Ruin, a large pueblo in northern New Mexico, from 1915 to 1929. His survey of the region, *An Introduction to the Study of Southwestern Archaeology* (1924), has become

a classic. Kidder was one of the first archaeologists to use a team of specialists to help analyze artifacts and human remains. He is also important for his "blueprint" for a regional strategy: (1) **reconnaissance**; (2) selection of criteria for ranking the remains of sites chronologically; (3) organizing them into a probable sequence; (4) stratigraphic excavation to elucidate specific problems; followed by (5) more detailed regional survey and dating.

## Classification and Consolidation

As we have seen, well before the end of the nineteenth 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, lasting until about 1960, that has been described as the "classificatory-historical period." Its central concern was chronology. Much effort went into the establishment of regional chronologies, and the description of the development of culture in each area.

It was scholars studying the prehistoric societies of Europe and North America who made some of the most significant contributions to the subject. In the United States there was a close link between anthropologists and archaeologists studying the Native Americans. The anthropologist Franz Boas reacted against the broad evolutionary schemes of his predecessors and demanded much greater attention to the collection and classification of information in the field. Huge inventories of cultural traits, such as pot and basket designs or types of moccasins, were built up. This tied in with the so-called "direct historical approach" of the archaeologists, who attempted to trace modern Native American pottery and other styles "directly" back into the distant past. By the 1930s the number of separate regional sequences was so great that a group of scholars led by W.C. McKern devised what became known as the **Midwestern Taxonomic System**, which correlated sequences in the Midwest by identifying similarities between artifact collections.

Professor Gordon Childe at the site of the Neolithic settlement at Skara Brae, Orkney, Scotland, in 1930.

Meanwhile, Gordon Childe, a brilliant Australian based in Britain and a leading thinker and writer about European prehistory, had almost single-handedly been making comparisons of this sort between prehistoric sequences in Europe. Both his methods and the Midwestern Taxonomic System were designed to order the material, to answer: To what period do these artifacts date? And also: With which other materials do they belong? This latter question usually carried with it an assumption that Childe made explicit: that a constantly recurring collection or **assemblage** of artifacts (a "culture" in his terminology) could be attributed to a particular group of people. This approach thus offered the hope of answering, in a very general sense, the question: To whom did these artifacts belong?

But Childe went beyond merely describing and correlating the culture sequences, and attempted to account for their origin. In the late nineteenth

century scholars had argued that all the attributes of civilization, from stone architecture to metal weapons, had spread or "diffused" to Europe from the Near East by trade or migration of people. With the much greater range of evidence available to him, Childe modified this approach and argued that Europe had undergone some indigenous development—but he nevertheless attributed the major cultural changes to Near Eastern influences.

Later Childe went on to try and answer the much more difficult question: Why had civilization arisen in the Near East? Himself influenced by Marxist ideas and the relatively recent Marxist revolution in Russia, he proposed that there had been a **Neolithic Revolution** that gave rise to the development of farming, and later an Urban Revolution, which led to the first towns and cities. Childe was one of the few archaeologists of his generation bold enough to address this whole broad issue of why things happened or changed in the past. Most of his contemporaries were more concerned with establishing chronologies and cultural sequences. But after World War II scholars with new ideas began to challenge conventional approaches.

### The Ecological Approach

One of the most influential new thinkers in North America was the anthropologist Julian Steward. Like Childe he was interested in explaining cultural change, but he brought to the question an anthropologist's understanding of how living cultures work. Moreover he highlighted the fact that cultures do not interact simply with each other, but with the environment as well. Steward christened the study of ways in which adaptation to the environment could cause cultural change "**cultural ecology**." Perhaps the most direct archaeological impact of these ideas can be seen in the work of Gordon Willey, one of Steward's graduate associates, who carried out a pioneering investigation in the Virú Valley, Peru, in the late 1940s. This study of some 1500 years of pre-Columbian occupation involved a combination of observations from detailed maps and aerial photographs, survey at ground level, and excavation and surface potsherd collection to establish dates for the hundreds of prehistoric sites identified. Willey then plotted the geographical distribution of these many sites in the valley at different periods and set the results against the changing local environment.

Quite independently of Steward, however, the British archaeologist Grahame Clark developed an ecological approach with even more direct relevance for archaeological fieldwork. Breaking away from the artifact-dominated **culture-historical approach** of his contemporaries, he argued that by studying how human populations adapted to their environments we can understand many aspects of ancient society. Collaboration with new kinds of specialists was essential: for example, specialists who could identify animal

## Key Developments

The early twentieth-century establishment of regional chronologies and sequences of artifacts

The development of scientific aids for archaeology, notably radiocarbon dating

The post-World War II development of an environmental or ecological explanation for past change

Increasing collaboration with specialists in other disciplines, such as animal or plant studies

Gordon Childe's bold questioning of why things happened or changed in the past

bones or plant remains in the archaeological record could help build up a picture not only of what prehistoric environments were like, but also what foods prehistoric peoples ate.

### The Rise of Archaeological Science

The other striking development of the period immediately after World War II was the rapid development of scientific aids for archaeology. We have already seen how pioneers of the ecological approach forged an alliance with specialists from the environmental sciences. Even more important, however, was the application to archaeology of the physical and chemical sciences.

The greatest breakthrough came in the field of dating. In 1949 the American chemist Willard Libby announced his invention of radiocarbon 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 complicated cross-cultural comparisons. Traditionally, prehistoric Europe had been dated by supposed contacts with early Greece and hence (indirectly) with ancient Egypt, which could itself be dated historically. The radiocarbon method now promised a completely independent chronology for ancient Europe. It also meant that to establish a date was no longer one of the main end products of research. It was still important, but it could now be done much more efficiently, allowing the archaeologist to go on to ask more challenging questions than merely chronological ones.

Archaeological applications for scientific techniques now include plant and animal studies, and methods for analyzing human remains and artifacts. Over the past decade developments in biochemistry and molecular genetics have led to the emergence of the new disciplines of molecular archaeology and archaeogenetics. Sensitive techniques in the field of chemistry are beginning to allow the precise identification of organic residues and are giving fresh insights into both diet and nutrition. The study of **DNA** (**deoxyribonucleic acid**), both modern and ancient, has offered novel approaches to the study of human evolution, and is now beginning to give the study of plant and animal domestication a systematic, molecular basis.

## A Turning Point in Archaeology

The 1960s mark a turning point in the development of archaeology. By this time some archaeologists were dissatisfied with the way research in the subject was being conducted. These dissatisfactions were not so much with excavation techniques, or with the newly developed scientific aids in archaeology, but with the way conclusions were drawn from them—how archaeologists explain things.

The fundamental cause for dissatisfaction with the traditional archaeology was that it never seemed to explain anything, other than in terms of migrations of peoples and supposed "influences." Already in 1948 the American archaeologist Walter W. Taylor had argued for an approach that would take into consideration the full range of a culture system. And in 1958 Gordon Willey and Philip Phillips argued for a greater emphasis on the social aspect, for a broader study of the general processes at work in culture history (a "processual interpretation").

That was all very well, but what would it mean in practice?

## The Birth of the New Archaeology

In the United States the answer was provided, at least in part, by a group of younger archaeologists, led by Lewis Binford, who set out to offer a new approach to the problems of archaeological interpretation, which was soon dubbed the **New Archaeology**. Binford and his colleagues argued against trying to use archaeological data to write a kind of "counterfeit history." They maintained that the potential of the archaeological evidence was much greater than had been realized for the investigation of social and economic aspects of past societies. It was a more optimistic view than that of many of their predecessors.

They also argued that archaeological reasoning should be made explicit. Conclusions should be based not simply on the authority of the scholar making the interpretation, but on an explicit framework of logical argument. Thus conclusions, if they are to be considered valid, must be open to testing.

Lewis Binford, the founder of the "New Archaeology," lecturing on his work among the Nunamiut hunters of Alaska.

These advocates of **processual archaeology** sought to explain rather than simply to describe, and to do so, as in all sciences, by seeking to make valid generalizations (**induction**). They tried to avoid the rather vague talk of the "influences" of one culture upon another, but rather to analyze a culture as a system that could be broken down into subsystems (such as technology, trade, or ideology), which could be studied in their own right. They placed much less emphasis on artifact **typology** (a sequence of design styles) and classification.

In order to fulfill these aims, the New Archaeologists to a large extent turned away from the approaches of history toward those of the sciences. There was a great willingness to employ more sophisticated quantitative techniques and to draw on ideas from other disciplines, notably geography.

In their enthusiasm to use a battery of new techniques and analytical tools, the New Archaeologists drew also on a range of previously unfamiliar vocabularies, which their critics tended to dismiss as jargon. Indeed in recent years, several critics have reacted against some of those aspirations to be scientific. But there can be no doubt that archaeology will never be the same again. Most researchers today, even the critics of the early New Archaeology, implicitly recognize its influence when they agree that it is indeed the goal