Studying the History of Archaeology

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Though there exists one major academic industry . . . telling the social scientists . . . how they can turn themselves into genuine scientists, there exists another, with at least as flourishing an output, putatively establishing that the study of man and society cannot be scientific.

ERNEST GELLNER, *Relativism and the Social Sciences* (1985), p. 120

Since the 1950s archaeology, especially in North America and western Europe, has shifted from a seemingly complacent culture-historical orthodoxy to ambitious theoretical innovations. These innovations have led to growing disagreements about the goals of the discipline and how these goals can be achieved. Increasing numbers of archaeologists, following in the wake of historians and sociologists, have abandoned positivist certainty and begun to entertain doubts about the objectivity of their research. They see social factors as determining not only the questions they ask but also the answers they judge to be convincing. Extreme versions of this view deny that archaeologists can offer interpretations of their data that are other than a reflection of the transient values of the societies in which they live. Yet, if archaeology cannot produce some kind of cumulative understanding of the past and a commentary that is at least partially independent of specific historical contexts, what scientific – as opposed to political, psychological, or aesthetic – justification can be offered for doing archaeological research?

These concerns have encouraged studying the history of archaeological thought as a means by which problems of subjectivity, objectivity, and the gradual accumulation of knowledge can be assessed. A growing number of archaeologists have come to agree with the philosopher and archaeologist R. G. Collingwood (1939: 132) that "no historical problem should be studied without studying . . . the history of historical thought about it." The clear implication of

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Collingwood's position is that archaeological interpretation and the history of archaeology are closely aligned. In recent decades, historical investigations of archaeological interpretation have multiplied and more advanced methodologies for carrying out such studies have been adopted from the history of science (Corbey and Roebroek 2001). Christopher Gosden (1999: 34) has argued that to be effective, disciplinary histories must not be purely intellectual or social but both.

This historical approach is not, however, without its critics. Michael Schiffer (1976: 193) once asserted that graduate courses should cease to be "histories of thought" and instead should systematically expound and articulate current theories, as, in a general sort of way, K. R. Dark has since done in his book *Theoretical Archaeology* (1995). Schiffer's position embodied the view that the truth or falseness of theoretical formulations is independent of social influences and hence of history but can be determined by applying scientifically valid procedures of evaluation to adequate bodies of data. Taken to an extreme, this view implies that the history and philosophy of archaeology are totally unrelated to each other.

The primary goal of this book is to survey the intellectual history of archaeology in an attempt to evaluate the claims of three alternative epistemologies that are currently being applied to archaeology. Positivist epistemologists maintain that society and culture exert no significant influence on the development of archaeology, which is shaped by explanations based on explicit theories being tested in the light of adequate evidence and according to proper scientific methods. Extreme relativists argue that the interpretation of archaeological data is so influenced by the intellectual persuasions, class interests, ethnic loyalties, gender prejudices, and personal self-interest of archaeologists that objectivity is impossible. There is no such thing as objective knowledge, and, therefore, no one truth but many possibly antithetical truths. Moderate relativists concede that archaeological interpretations are influenced by society, culture, and self-interest but maintain that archaeological evidence constrains speculation. The term relativism, as used here, embraces both relativism, in the strict sense of phenomena being perceived, valued, and understood differently as a result of cultural variation, and subjectivism, which refers to how phenomena are perceived, valued, and understood differently as a result of variations in individual

comprehension. To address these questions, it is necessary to consider what archaeologists have learned about the past, how the methods they use to study the past have changed, what ideas have guided the development of archaeology at different periods, how these ideas relate to broader social, cultural, and intellectual trends, whether different societies produce different kinds of archaeology and, if so, what are the differences, and finally whether there is long-term convergence or divergence in the development of archaeology. It also cannot be assumed that the same factors necessarily influence archaeology to the same extent at every stage in its development.

Archaeology is not a universal or self-evident activity. In some countries, people debate whether foreign archaeologists are treasure hunters or spies. They cannot imagine that anyone would be interested in going to so much trouble and expense to study the past for its own sake. In Western civilization, despite the popularity of the Indiana Jones stereotype, it is generally accepted that archaeology is an esoteric discipline that has no relevance for the needs or concerns of the present. Ernest Hooton (1938: 218) once described archaeologists as "the senile playboys of science rooting in the rubbish heaps of antiquity." Yet for almost 200 years a widespread concern for the broader implications of archaeological discoveries has contradicted this image of archaeology. No one would deny the romantic fascination aroused by spectacular archaeological finds, such as those by Austen Layard at Nimrud or Heinrich Schliemann at Troy in the nineteenth century, and the more recent discoveries of the tomb of Tutankhamen, the Palace of Minos at Knossos, the life-size ceramic army of the Chinese Emperor Qin Shihuangdi, and numerous several-million-years-old remains of hominids in East Africa. This does not, however, explain the intense public interest in the controversies that have surrounded the interpretation of many more routine archaeological finds, the attention that diverse political, social, and religious movements throughout the world have paid to archaeological research, and rigorous efforts by various totalitarian regimes to control the interpretation of archaeological data. During the second half of the nineteenth century, archaeology was looked to for support by both sides in the debate about whether evolutionism or the book of Genesis provided a more reliable account of human origins. Later, W. M. F. Petrie, Leonard Woolley, and John Garstang claimed to have made finds in Egypt, Iraq, and Palestine that supported

historical accounts in the Hebrew Bible. Elsewhere German and Polish archaeologists engaged in polemics about whether the Lusatian culture had been created by prehistoric Germans or Slavs. As recently as the 1970s, Peter Garlake, a government-employed archaeologist in Southern Rhodesia, found his position no longer tenable because he refused to cast doubt on conclusive archaeological evidence that stone ruins in that part of central Africa had been built by ancestors of the Bantu peoples who live in that region. Today, the findings of ecological archaeologists are being coopted both by conservationists and by those who are anxious to minimize legal restraints on environmental pollution and degradation.

My adoption of a historical perspective does not mean that I claim any privileged status with respect to objectivity for such an approach. Historical interpretations are notoriously conjectural and open-ended, to the extent that some historians have characterized them as merely expressions of personal opinion. It is also recognized that, because of the abundance of historical data, evidence can be selectively marshaled to "prove" almost anything. There may, however, be some truth in William McNeill's (1986: 164) argument that, even if historical interpretation is a form of myth-making, such myths help to guide public action and can be regarded as a human substitute for instinct. If this is so, it follows that they are subject to the operation of the social equivalent of natural selection and hence may more closely approximate reality over long periods of time. This, however, is a tenuous basis on which to base hopes for the objectivity of historical interpretations.

I therefore do not claim that the historical study presented here is any more objective than are the interpretations of archaeological or ethnological data that it examines. I believe, however, as do many others who study the history of archaeology, that a historical approach offers a special vantage point from which to examine the changing relations between archaeological interpretation and its social and cultural milieu. The time perspective provides a different basis for studying the ties between archaeology and society than do philosophical or sociological approaches. In particular, it permits the researcher to identify the influence of subjective factors by observing how and under what circumstances interpretations of the archaeological record have changed. Although this does not eliminate the bias of the observer, or the possibility that this bias will influence

the interpretation of archaeological data, it increases the chances of gaining more rounded insights into what happened in the past.

Approaches to the History of Archaeology

The need for a more systematic study of the history of archaeological interpretation is indicated by serious disagreements about the nature and significance of that history. Much of the controversy centers on the role played by explanation in the study of archaeological data over the last two centuries.

Some historians of archaeology believe that the discipline has evolved in a predetermined manner through a series of stages (Schwartz 1967; Fitting 1973). In *A History of American Archaeology*, G. R. Willey and J. A. Sabloff (1974, 1980) posited an initial Speculative period (1492–1840) followed by Classificatory-Descriptive (1840–1914), Classificatory-Historical (1914–1960), and Explanatory (1960–) ones. This scheme was based in part on Douglas Schwartz's (1967) previous division of the history of American archaeology into three stages: Speculative, Empirical, and Explanatory. Only in the 1993 edition of *A History of American Archaeology* was the final period, which began in 1960, renamed the Modern one. Although this series of stages was applied only to New World archaeology, Willey and Sabloff (1974: 209–10) observed that their scheme was likely to apply everywhere. They proposed that over the course of 150 years archaeology had developed according to an inductive Baconian model of doing science, which involves first collecting data, then describing and classifying it, and finally trying to explain it. Yet this approach does not account for why archaeological findings were already highly controversial during the nineteenth century. Such debates were only possible because various conclusions about the past were already being drawn on the basis of available evidence and some of these conclusions were offending people. Also, if archaeologists could not draw any conclusions, what motivated them to continue to study the past or to collect artifacts? As the British historian E. H. Carr (1967: 3–35) has reminded us, the mere characterization of data as being relevant or irrelevant, that occurs even in the most descriptive historical studies, implies the existence of some kind of theoretical framework. It can further be argued in opposition to the idea of a neutral observational language that not even the simplest

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archaeological fact can be established independently of a theoretical context (Wylie 1982: 42). In the past, most of these frameworks were not formulated explicitly or even consciously by archaeologists. Today, especially in the context of American and British archaeology, many theoretical propositions are systematically elaborated. Explanation was an inherent aspect of archaeology from the beginning, even if much of the theory that was employed was left implicit rather than clearly spelled out.

David Clarke (1973) proposed a convergent model of archaeological development. He argued that until the 1960s archaeology had consisted of isolated regional traditions of research, each following its own idiosyncratic and largely uncritical practices and characterized by its own preferred forms of description, interpretation, and explanation. Because these sorts of archaeology were scientifically undisciplined, their modes of analysis tended to be highly subjective and produced the results that local archaeologists expected. According to Clarke, in the 1960s these prescientific approaches were replaced by a new, sophisticated, self-critical, universal, and objective scientific archaeology. This is a false, or at best partial, view of the history of archaeology. International contacts characterized archaeology from the earliest stages of its development. Therefore, if local forms of research have been radically different from one another, an explanation other than mutual isolation is required.

Many archaeologists have utilized the philosopher Thomas Kuhn's (1962, 1970) more relativistic concept of scientific revolutions to try to understand the development of archaeology. Kuhn formulated his ideas to explain the development of the physical sciences and, in the first edition of *The Structure of Scientific Revolutions* (1962), he spoke of a preparadigmatic period to which his concept of scientific revolutions did not apply. He also appears to have believed that all social sciences remained in that category. However, in the second edition, he accepted that immature disciplines might be described as having multiple research paradigms (Kuhn 1970). Kuhn described a research paradigm as having an accepted canon of scientific practice, including laws, theory, applications, and instrumentation, that provides a model for a "particular coherent tradition of scientific research." Such a tradition is sustained by a "scientific community," defined as a group of scholars working together in the same discipline. Kuhn argued that every scientific community develops a paradigm

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that influences the types of questions thought to be worth asking, the theories that are used to explain data, and the procedures that are employed to collect and analyze evidence. Scientists promote such paradigms through their control of teaching, journals, research grants, professional accreditation, hiring, tenure, and promotion. In normal times, scientists conduct their research within the context of the dominant paradigm, which they seek to elaborate. Paradigms are thus not merely scientific theories but also belief systems that constitute the culture of scientific communities. In adopting this view, Kuhn was building on the work of Ludwik Fleck ([1935], English translation 1979), who maintained that science was a collective creation within a social milieu.

According to Kuhn, paradigm shifts occur when an old paradigm is seen as not supported by accumulating data or when scientists working within it grow interested in problems that the existing paradigm is not equipped to answer. Kuhn maintained that this leads to the old paradigm's being replaced by a new one. He also argued that successive paradigms are incommensurate. This means that a scientist working in terms of one paradigm can never understand how matters are perceived by someone working in terms of an alternative one. Kuhn originally argued in extreme relativistic terms that a new paradigm was not necessarily more comprehensive or accurate than its predecessor. Eventually, he accepted that, at least in the physical sciences, later paradigms are more comprehensive and account for more than do antecedent ones (Kuhn 1970; Bird 2000). This represented a shift from an extreme to a more moderate relativist position. He also argued late in his career that without debates among scientists who hold different views, incorrect assumptions would go unchecked and improved scientific insights would be impossible (Kuhn 1977).

Some archaeologists, especially processual ones seeking to enhance the innovativeness of their movement, combined Kuhn's idea of scientific revolutions with a unilinear evolutionary view of the development of their discipline. They maintained that successive phases in the development of archaeological theory display enough internal consistency to qualify as paradigms and that the replacement of one paradigm by another constituted a scientific revolution (Sterud 1973). According to this view, successive innovators, such as Christian Thomsen, Oscar Montelius, Gordon Childe, and

Lewis Binford, recognized major anomalies and inadequacies in conventional interpretations of archaeological data and created new paradigms that significantly changed the direction of archaeological research. These paradigms not only altered the significance that was accorded to archaeological data but also determined what kinds of problems were and were not regarded as important. Clarke, however, regarded archaeology before 1960 as being in a preparadigmatic state.

Such unilinear views of the history of archaeology fail to account for why archaeologists or other social scientists, in part because of the emergent complexity of their subject matter, never agree about high-level theory. This disagreement has meant that several rival paradigms coexist at any one time. Currently, processual archaeology treats ideas as epiphenomenal, whereas postprocessual archaeology regards them as the principal determinants of behavior. Simultaneously, evolutionary archaeology is seeking to create a new paradigm by combining elements of culture-historical archaeology with a selectionist Darwinian explanation of changes in material culture. Although archaeologists often display considerable bias in their support for different schools, there is no evidence that they are trapped in noncommunicating discourses or that it is impossible for them to understand their opponents. On the contrary, their arguments often display considerable knowledge of such positions. Robert Chapman (2003: 14) argues that in archaeology rival positions are not only not hermetically sealed but also internally highly variable. Thus, they are not incommensurate with one another in the Kuhnian sense. Both Michael Schiffer (1996: 659) and Todd and Christine VanPool (2003) maintain that regarding theoretical orientations as paradigms radicalizes positions and encourages exclusion and polemic rather than the systematic comparison, testing, and synthesis of ideas.

The relevance of Kuhn's concept of revolutionary change also has been questioned. Most alterations in the theory and practice of archaeology appear to occur gradually and there are growing doubts that even what appear to be rapid shifts accord with his concept of revolutions. Kuhn also failed to account for the longevity of various positions and for why rival positions fluctuate in relative importance, often repeatedly, rather than one position definitively replacing another, or for why few positions are ever totally abandoned. Thus, the new cultural anthropology and postprocessual archaeology

address many of the same issues that Boasian culture-historical anthropology and archaeology once did, and early neoevolutionary archaeology strongly resembled nineteenth-century unilinear archaeology. To accommodate the concept of paradigm to these realities, Margaret Masterman (1970) differentiated three main types of paradigm: metaphysical, relating to the worldview of a group of scientists; sociological, that define what is accepted; and construct, that supply the tools and methods for solving problems. No one of these types alone constitutes "the" paradigm of a particular era. Despite such efforts to modify Kuhn's ideas, there is a growing sense that the concept of paradigm may not be appropriate to describe changing trends in interpretation in archaeology or any of the social sciences, and perhaps not even in science in general (Gándara 1980, 1981). Finally, Jean Molino (1992: 19) argues that nothing is more dangerous than the belief that a scientific revolution allows a science to start again. Old questions, methods, and answers frequently remain valid. Once the principle of stratigraphy was established as a reliable technique for inferring chronology, it continued to be used by archaeologists regardless of what other views they might espouse (Dunnell 2001: 1298). The same is true of Ian Hodder's (1982b) demonstration that material culture can be used to distort or invert as well as to reflect social reality. The development of such broad agreements is another factor reducing the incommensurability of different bodies of theory. For all these reasons, I will avoid the term "paradigm" and speak simply of schools or theoretical positions.

Shaun Hides (1996) and, in a more nuanced and careful manner, Ian Morris (1994b) have attempted to understand the development of archaeology in relation to Michel Foucault's (1970, 1972) concept of four successive but radically different and in his view discontinuous *epistemes* or modes of knowledge: Renaissance (ca. 1400–1650), Classical (ca. 1650–1800), Modern (ca. 1800–1950), and Postmodern (ca. 1950–). Foucault understands these epistemes as general modes of thought, each of which in turn influenced all fields of knowledge and dominated an era of modern Western civilization. Each episteme is radically different from any other. No one could escape the episteme of the time in which they lived, which imposed a particular set of norms and postulates on all thinking. Thus, epistemes, as dominant cultural patterns, are very different from Kuhn's paradigms,

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although both have been used to characterize general stages in the development of scientific interpretation.

Although Foucault's views about epistemes have potentially valuable contributions to make to understanding the development of archaeological thought, they have been criticized because of his reluctance to study causation and how epistemes may have been influenced by changing social realities (Morris 1994b: 10; Gutting 1989). Foucault also appears to underestimate the extent to which epistemes have overlapped and mutually influenced people's thinking. Epistemes can contribute little to understanding the theoretical diversity that characterizes archaeology at any given point in time.

An alternative unilinear evolutionary view to those based on the ideas of Kuhn and Foucault, and that accords with Stephen Toulmin's (1970) thesis that sciences do not experience revolutions but, rather, gradual changes or progressions, holds that the history of archaeology has been characterized by a cumulative growth of knowledge about the past from early times to the present (Casson 1939; Heizer 1962a; Meltzer 1979). It is maintained that, although various phases in this development may be delineated arbitrarily, in reality archaeology changes in a gradual fashion, with no radical breaks or sudden transformations. Some archaeologists view the development of their discipline as following a course that is inevitable. Jaroslav Malina and Zdenek Vašíček (1990) document how an expanding database, with evidence increasingly being derived from settlement data and ecofacts as well as from artifacts and monuments, together with new theories from the other social sciences and biology has shaped the development of archaeology. Like other unilinear views, theirs does not take account of the variability of archaeological theories at any one time. Nor does it explain the frequent failure of archaeologists to develop their ideas in a systematic fashion. For example, although nineteenth-century naturalists with archaeological interests, such as Japetus Steenstrup (Morlot 1861: 300) and William Buckland (Dawkins 1874: 281–4), carried out experiments to determine how faunal remains were introduced into sites, research of this sort did not become routine in archaeology until the 1970s (Binford 1977, 1981).

Other historians of archaeology have rejected unilinear interpretations in favor of cyclical ones. This view began with Stuart Piggott (1935, 1950, 1968, 1976, 1985) and Glyn Daniel (1950). They argued

that archaeological interpretations were influenced by the varying popularity of the opposing rationalist and romantic views of human behavior that had been constructed in France during the eighteenth century. The romantic view was seen as encouraging an interest in culture-history, ethnicity, and idealism in archaeology, whereas rationalism encouraged the adoption of evolutionary and materialist approaches. Piggott and Daniel assumed that human behavior was too complex and unpredictable ever to be fully understood. They believed that archaeological interpretations therefore tended to reflect the dominant intellectual fashions of the time, which themselves changed in an unpredictable manner. It was therefore concluded that little progress could be made in understanding the past apart from that facilitated by a growing database. Archaeologists often returned to studying the same problems after long gaps during which what had been learned previously had been forgotten. Another application of a cyclical view to studying the history of archaeology is Kristian Kristiansen's (2002) characterization of Danish archaeology as consisting of alternating phases of interest in ecological and culture-historical problems. Although these shifts can be construed as alternations of rationalist and romantic approaches, they do not appear to have been produced by alterations in general intellectual fashions but by processes internal to Danish archaeology and society.

Some archaeologists doubt that the basic interests and concepts of their discipline change significantly from one period to another. Bryony Orme (1973: 490) has maintained that the archaeological interpretations offered in the past were more like those of the present than is commonly believed and that archaeological preoccupations have changed little. Jean-Claude Gardin (1980: 165–80) argues that it is wrong to believe that there is a great gap between the present and earlier times in the "small world" of archaeological interpretation. He suggests that there has been little change in what archaeologists do over time, that the same formulae have been used for site reports over a long period, and that there is no gulf between processual and postprocessual approaches. Long-term continuities in interpretation have been shown to occur in studies of human evolution (Landau 1991; Stoczkowski 2002). A remarkable antiquity also can be demonstrated for some ideas that are commonly believed to be modern. Archaeologists argued that growing population densities led to the adoption

of more labor-intensive forms of food production long before they rediscovered this idea in the work of the economist Ester Boserup (Smith and Young 1972). As early as 1673, the British statesman William Temple had adumbrated this theory with his observation that high population densities force people to work hard (Slotkin 1965: 110–11). In 1843, the Swedish archaeologist Sven Nilsson (1868: lxvii) argued that increasing population had brought about a shift from pastoralism to agriculture in prehistoric Scandinavia. This concept also was implicit in the "oasis" theory of the origin of food production, as expounded by Raphael Pumpelly (1908: 65–6) and adopted by Harold Peake and H. J. Fleure (1927) and then by Gordon Childe (1928). They proposed that postglacial desiccation in the Middle East had compelled people to cluster around surviving sources of water, where they had to innovate in order to feed higher population densities. Yet, although ideas persist and recur in the history of archaeology, this does not mean that there is nothing new in the interpretation of archaeological data. Such ideas must be examined in relation to the different conceptual frameworks of which they were a part at each period. It is from these frameworks that these concepts derive their significance to the discipline and, as the frameworks change, their significance does as well. According undue importance to particular ideas and not paying enough attention to their changing context will lead archaeologists to underestimate the amount of change that has characterized the development of archaeological interpretation. It also has been argued that a major goal of the history of archaeology must be to study critically how archaeological concepts and understandings have altered over time, so that they are not accepted as natural and given in their current state (Trigger 1978b). Recent work along these lines has been inspired by Pierre Bourdieu's (1980) concept of the social history of the social sciences (Moro Abadía and González Morales 2003).

Many archaeologists note that one of the principal characteristics of archaeological interpretation has been its enduring regional diversity. Leo Klejn (1977, 1990) and Trigger and Glover (1981–1982) have examined the history of archaeology as one of regional schools. In her review of Japanese and North American studies of the Jomon culture, Junko Habu (2004: 5) has demonstrated how assumptions, goals, methods, and theoretical developments cannot be considered apart from one another in a single tradition of archaeological practice

and hence the distinctive and often complementary findings of different research traditions cannot be sucessfully synthesized without an understanding of the specific circumstances in which these findings were produced. Nadia Abu El-Haj (2001) argues that specific expressions of archaeological practice must be examined independently in order to understand how each of them articulated with, and both transformed and was shaped by, local social and political conditions. She implies that little is to be gained by comparing such situations and trying to generalize about them. Yet, although Abu El-Haj is correct that every practice of archaeology has unique features, this does not mean that detailed comparisons may not help to understand better archaeological practice and the history of archaeology.

Robert Dunnell (2001: 1290–1) argues that the overall history of archaeology displays both a lack of linear development and much parochial diversity. This is because archaeology is not a science in the sense that it systematically uses theory to explain evidence. Dunnell regards archaeology as remaining in a preparadigmatic state. Only occasionally has something resembling a paradigm arisen and these have proved to be short-lived.

It is clear that there have been, and still are, regional traditions in archaeological interpretation and that each of them has its own unique features (Daniel 1981b; Evans et al. 1981: 11–70). What has not yet been studied adequately is the significance of their divergences. To what degree do they represent irreconcilable differences in the understanding of human behavior, differences in the questions being asked, or the same basic ideas being studied under the guise of different terminologies?

Over the past few decades, archaeologists have identified various types of approaches to doing archaeology, each of which is represented by various examples in different parts of the world. Although these began with geographical groupings, as the list has expanded it has come to include other types of social differences. Each type is distinguished by the cause whose interest it serves: national archaeology (Fleury-Ilett 1996: 200–1), nationalist archaeology, colonialist archaeology, imperialist archaeology (Trigger 1984a), third-world archaeology (Chakrabarti 2001: 1191–3), continentalist archaeology (Morris 1994b: 11), regional or proto-national archaeology (Díaz-Andreu 1996b: 86), community archaeology (Moser 1995a; Marshall 2002), indigenous archaeology (Watkins 2000),

internalist archaeology (Yellowhorn 2002), working-class archaeology (McGuire and Reckner 2003), touristic archaeology, and the archaeologies of protest (Silberman 1995: 261), of the disenfranchised, and of cultural identity (Scham 2001). The list might technically include gender archaeology although this approach is different because, instead of simply representing an alternative focus of research, it has established itself as a necessary and integral part of all other archaeologies. Although no two examples of any one of these varied approaches to archaeology are identical, they share sufficient features to identify each approach as a distinctive type, the development and function of which are worthy of study.

Yet ideas diffuse and convergent as well as independent development characterize archaeology. Studies of archaeology, with a few notable exceptions (I. Bernal 1980; Chakrabarti 1982), have failed to take account of the vast intellectual exchange that characterized the development of archaeology in all parts of the world during the nineteenth and twentieth centuries. This is dramatically illustrated by the early study of shell mounds. Reports of the pioneering studies by Danish scholars, who began their work in the 1840s, stimulated a large number of investigations of shell heaps along the Atlantic and later the Pacific coasts of North America in the latter half of the nineteenth century (Trigger 1986a). When the American zoologist Edward Morse went to teach in Japan, after analyzing material from shell mounds along the coast of Maine for the Harvard University archaeologist Jeffries Wyman, he discovered and excavated in 1877 a large Mesolithic shell deposit at Omori, near Tokyo. Some of his students dug another shell mound by themselves and it was not long before Japanese archaeologists who had been educated in Europe established the study of the Mesolithic Jomon culture on a professional basis (Ikawa-Smith 1982). The Scandinavian studies also stimulated the early investigation of shell mounds in Brazil (Ihering 1895) and Southeast Asia (Earl 1863). Even the ideologically opposed archaeological traditions of Western Europe and the Soviet Union significantly influenced each other, despite decades when scientific contact of any sort was very difficult and politically dangerous for scholars on both sides of the Iron Curtain. For all these reasons it seems unwise to overestimate the historical independence or theoretical distinctiveness of these regional archaeologies. One of the important tasks for historians of archaeology is to

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determine to what extent developments in one region did or did not influence developments elsewhere. For early times, this is hard to do because archaeologists often failed to indicate the sources of their ideas.

Less attention has been paid to the effects of disciplinary specialization within archaeology on the ways in which archaeological data are interpreted (Rouse 1972: 1–25). Yet differing orientations along these lines may account for as many differences as do social and political orientations. Classical archaeology, Egyptology, and Assyriology have been strongly committed to studying epigraphy and art history within a historical framework (Bietak 1979). Medieval archaeology developed as an investigation of material remains that complements research based on written records (M. Thompson 1967; D. M. Wilson 1976; Barley 1977; Andrén 1998). Palaeolithic archaeology developed alongside historical geology and palaeontology and has maintained close ties with these disciplines, whereas the study of later prehistoric periods frequently combines information from numerous other disciplines, including linguistics, folklore, biological anthropology, and comparative ethnology, with archaeological findings (D. McCall 1964; Trigger 1968a; Jennings 1979).

Yet, although many of these types of archaeology have developed in considerable intellectual isolation from each other over long periods and have been further estranged as a result of the balkanization of their respective jargons, historical connections, sporadic interaction, and common methodological interests have been sufficient for all of them to share numerous interpretive concepts. Tim Murray (2001a: xix–xx) points out that, despite archaeology's great diversity, the common questions and fundamental activities, such as classification, that lie at the core of archaeology enable archaeologists to communicate with each other and exchange knowledge. Yet, although they share a general commitment to making the human past intelligible and to developing the intellectual tools required for this task, archaeologists have gone about doing their work in many different ways and have sought to use archaeology to serve many different political and cultural ends.

More narrowly focused studies of the history of archaeology examine the role played by institutions, such as archaeological societies and archaeological departments in museums or universities, in promoting the development of archaeology. Michael O'Brien, R. Lee

Lyman, and Michael Schiffer (2005) have traced the development of New Archaeology in terms of the contributions of individual archaeologists and of clusters of cooperating or competing archaeologists. Michael Balter (2005) has studied, again from the perspective of the individual participants, the interactive team that has been excavating at the early Neolithic site of Çatalhöyük, in Turkey, under the innovative leadership of Ian Hodder. This fine-grained type of approach reveals much about the social dynamics and academic strategies that have shaped broader trends in the development of archaeology.

Biography and autobiography have long been part of the history of archaeology, but they have generally been viewed as a means of celebrating or justifying the careers of individual archaeologists. Today, there is growing interest in using a biographical approach to investigate how archaeologists have interpreted the past. John Chapman (1998) explains the role that the real-life experiences of the Lithuanian-born archaeologist Marija Gimbutas played in shaping her interpretations of European prehistory, especially the distinction that she drew between what she believed had been a matriarchal and peaceful Early Europe and the patriarchal and warlike Indo-European societies that replaced it. Jean-Paul Sartre (1971–1972) explored in detail the problems of this sort of approach in his innovative "total biography" of the French novelist Gustave Flaubert. He showed how Flaubert was shaped by the culture in which he lived and the social class to which he belonged. He also demonstrated, however, that many aspects of Flaubert's life and writings could only be understood by means of a detailed psychological analysis of his childhood and family relations. Clearly, if we are to understand all aspects of what archaeologists do, we have to study them as individuals. Sartre's work makes it clear that because of psychological factors even archaeologists who share similar ethnic and class backgrounds and the same historical experiences are unlikely to interpret archaeological data in precisely the same manner. By contrast, analogous social and cultural contexts produce general similarities in the interpretation of archaeological data that are deserving of consideration.

Although biographical and sociopolitical perspectives on the history of archaeology are complementary, some of the specific approaches outlined above are contradictory and hence not all of them can be valid. Because this study attempts to trace the development of archaeological thought from a broad perspective, it is impossible

for it to examine the contributions of all archaeologists or even to investigate systematically the developments that have taken place in each country and each branch of archaeology (Schuyler 1971). Instead, I will investigate a number of major interpretive trends in roughly the chronological order in which they came into prominence. These trends frequently overlapped and interacted with one another, both temporally and geographically, and the work of individual archaeologists often reflects several of these trends, either at different stages of their careers or in some combination at a single point in time. My thematic approach allows a historical study to take account of changing styles of archaeological interpretation that cannot be fitted into clearly defined chronological or geographical pigeon-holes but that reflect waves of innovation that have transformed archaeology.

Social Context

No one denies that archaeological research is influenced by many different kinds of factors. The most controversial of these is the social context in which archaeologists live and work. Very few archaeologists, including those who favor a positivistic view of scientific research, would reject the proposal that the questions archaeologists ask are influenced at least to some degree by this milieu. Yet positivists maintain that, so long as adequate data are available and these data are analyzed using proper scientific methods, the validity of the resulting conclusions is independent of the prejudices or beliefs of the investigator. Other archaeologists believe that, because their discipline's findings concerning the past consciously or unconsciously are perceived to have implications for the present or about human nature generally, and because people easily accept what they want to believe but demand overwhelming evidence before they accept ideas that they find abhorrent, changing social conditions influence not only the questions archaeologists ask but also the answers that they are predisposed to find acceptable. Even statistical tests, because they employ arbitrary levels of confidence, are open to subjective interpretation. Strong positivists, who believe that a single exception invalidates a law, would theoretically have to examine all possible cases to prove that they are dealing with a universal generalization. Because such proof is normally impossible, faith is also involved there.

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David Clarke (1979: 85) had these subjective factors in mind when he described archaeology as an adaptive system "related internally to its changing content and externally to the spirit of the times." Elsewhere he wrote: "Through exposure to life in general, to educational processes and to the changing contemporary systems of belief we acquire a general philosophy and an archaeological philosophy in particular – a partly conscious and partly subconscious system of beliefs, concepts, values and principles, both realistic and metaphysical" (Ibid.: 25). Still earlier, Collingwood (1939: 114) had observed that every archaeological problem "ultimately arises out of 'real' life . . . we study history in order to see more clearly into the situation in which we are called upon to act."

In recent decades archaeology has been powerfully influenced by the attacks that relativists have launched against the concept of science as a rational and objective enterprise. These attacks have their roots in the antipositivism of the para-Marxist Frankfurt School, as represented in the writings of Walter Benjamin (1969), Jürgen Habermas (1971), and Herbert Marcuse (1964). These philosophers stressed that social conditions influence both what data are regarded as important and how they are interpreted (Kolakowski 1978c: 341–95). Their views have been strengthened by Kuhn's paradigmatic concept, by the arguments of the sociologist Barry Barnes (1974, 1977) that scientific knowledge is not different in kind from any other forms of cultural belief, and by the anarchistic claims of the American philosopher of science Paul Feyerabend (1975) that, because objective criteria for evaluating theories do not exist, science should not be fettered by rigid rules and personal preferences and aesthetic tastes may be relied on when evaluating rival theories. Ideas of this sort have attracted a considerable following among self-styled critical archaeologists, especially in Britain and the United States.

Although some relativists argue that, in the long run, greater awareness of social biases will promote more objectivity (Leone 1982), others maintain that even basic archaeological data are mental constructs and, hence, are not independent of the social milieu in which they are created and utilized (Gallay 1986: 55–61). The more extreme relativists ignore the qualifications of Habermas and Barnes that "knowledge arises out of our encounters with reality and is continually subject to feedback-correction from these encounters" (B. Barnes 1977: 10). Instead, they conclude that archaeological

interpretations are determined entirely by their social context rather than by any objective evidence. Thus statements about the past cannot be evaluated by any criteria other than the internal coherence of a particular study "which can only be criticised in terms of internal conceptual relations and not in terms of externally imposed standards or criteria for 'measuring' or 'determining' truth or falsety" (Miller and Tilley 1984b: 151). A broad spectrum of alternatives separates those hyperpositivistic archaeologists who believe that only the quality of archaeological data and of analytical techniques determines the value of archaeological interpretations and the hyperrelativists who are inclined to accord archaeological data no role, but instead explain archaeological interpretations entirely in terms of the social and cultural loyalties of researchers. Despite its extremes and inconsistencies, the relativist critique of science has played an important and on the whole a beneficial role in making social scientists more aware of the subjective biases that influence their findings.

Although the influences that societies exert on archaeological interpretations are potentially very diverse, the development of archaeology has corresponded temporally with the rise to power of the middle classes in Western society. Many of the early patrons of classical archaeology belonged to the aristocracy, but ever since the Italian trader Ciriaco de' Pizzicolli in the fifteenth century, those who have actively studied archaeological remains have come predominantly from the middle classes. They have been civil servants, clergymen, wealthy merchants, country squires, and, with increasing professionalization, university teachers and museologists. In addition, much of the public interest in archaeological findings has been associated with the educated members of the bourgeoisie.

All branches of scientific investigations that have developed since the seventeenth century have done so under the aegis of the middle classes. Because archaeology and history are readily intelligible disciplines, their findings have important implications for shaping views of human nature and how and why modern societies have come to be as they are (Levine 1986). This transparent relevance for current political, economic, and social issues has made relations between archaeology and society especially complex and important. It therefore seems reasonable to examine archaeology as an expression of the ideology of the middle classes and to try to discover to what extent

changes in archaeological interpretation reflect the altering fortunes of that group. Yet, although it is reasonable to assume that archaeologists are always influenced by the circumstances in which they live, it does not necessarily follow that, as archaeological data accumulate and archaeology develops as a discipline, all archaeological interpretations will be influenced to the same extent by contemporary social biases.

Moreover, the middle classes have not been a homogeneous phenomenon, either over time or in any one society. Their interests and degree of development have varied greatly from one country to another and within each country they have been divided into various strata, with individuals who prefer either more radical or more conservative political options being present in each stratum. The bourgeoisie of the Ancien Régime in France, composed largely of clerics, professionals, and royal administrators, has to be distinguished from the entrepreneurial bourgeoisie and factory owners of the industrial era (Darnton 1984: 113; E. Wood 2000). It is also evident that archaeology has not been of equal interest to the whole middle class, but mainly to that part of it, largely composed of professionals, which is inclined to be interested in scholarship (Kristiansen 1981; Levine 1986). Karl Marx noted rather condescendingly that in many ways intellectuals were very different in outlook and interest from other members of the middle class. He argued that what made them "representatives of the lower-middle class is the fact that in their minds they do not get beyond the limits which the lower-middle class do not get beyond in life, and that they are consequently driven, theoretically, to the same problems and social positions to which material interest and social position drive the latter in practice" (Marx [1852] in Marx and Engels 1962, I: 275).

Relations between interests and ideas are contextually mediated by a large number of heterogeneous factors. Archaeologists therefore cannot expect to establish a one-to-one correspondence between specific archaeological interpretations and particular class interests. Instead, they must analyze the ideas influencing archaeological interpretations as tools with which social groups seek to achieve their goals in particular situations. Among these goals are to enhance a group's self-confidence by making its success appear natural, predestined, and inevitable; to inspire and justify collective action; and to disguise collective interests as altruism (B. Barnes 1974: 16); in

short, to provide groups and whole societies with mythical charters (McNeill 1986). Without denying the significance of individual psychological traits and cultural traditions, such considerations provide an important focus for examining the relations between archaeology and society.

Most professional archaeologists also believe archaeological interpretation to be significantly influenced by a large number of other factors. All but the most radical relativists agree that one of these is the archaeological database. Archaeological data have been accumulating continuously over several centuries and new data are held to constitute a test of earlier interpretations. Yet what data are collected and by what methods are influenced by every archaeologist's sense of what is significant, which in turn reflects his or her theoretical presuppositions. This creates a reciprocal relation between data collection and interpretation that leaves both open to social influences. Moreover, the data recovered in the past are often neither adequate nor appropriate to solve the problems that are considered important at a later time. This is not simply because archaeologists were unfamiliar with techniques that became important later and therefore failed to preserve charcoal for radiocarbon dating or soil samples for phytolith analysis, although such gaps in documentation can be extremely limiting. New perspectives frequently open up whole new lines of investigation. For example, Grahame Clark's (1954) interest in the subsistence economy of the Mesolithic period led him to ask questions that could not be answered using data collected when the main interest of Mesolithic studies was typological (Clark 1932). Likewise, the development of an interest in settlement archaeology revolutionized archaeological site surveys (Willey 1953) and provided a stronger impetus for the recording and analysis of intrasite distributions of features and artifacts (Millon et al. 1973). Hence, although archaeological data are collected continuously, the results are not necessarily as cumulative as many archaeologists believe. Indeed, archaeologists often seem to build more readily on what their predecessors concluded about the past than on the actual evidence on which those conclusions were based.

What archaeologists can study is also influenced by the resources that are made available for archaeological research, the institutional and public contexts in which research is carried out, and the kinds of investigations societies or governments are prepared to let

archaeologists undertake. To obtain support archaeologists must please their sponsors, whether these be wealthy patrons (Hinsley 1985), colleagues and politicians managing the allocation of public funds (Patterson 1986a, 1999), or the general public. There also may be social restrictions on excavating certain kinds of sites, such as cemeteries or religious localities. To protect cultural resources, governments frequently enact stringent controls over when and how archaeologists excavate and how they record their findings. They sometimes prevent archaeologists from sending even mundane finds, such as soil samples, abroad for analysis. There is also a growing tendency to assign responsibility for managing archaeological research to local or ethnic groups on the grounds that such resources are part of their heritage. Although many archaeologists accept these controls as appropriate, they may impose major constraints on the research archaeologists do and how they interpret their finds. Such constraints have given rise to considerable tensions between archaeologists and aboriginal resource managers (Moser 1995b; Nicholas and Andrews 1997; Swidler et al. 1997; D. Thomas 2000).

Until the twentieth century, few archaeologists were educated in the discipline. Instead they brought to archaeology a variety of skills and viewpoints acquired in many different fields and avocations. All of them had studied a general school curriculum in which classical and biblical material was emphasized. Basic principles derived from a widespread interest in numismatics played an important role in the development of typology and seriation by Christian Thomsen, John Evans, and other early archaeologists (McKay 1976). In the nineteenth century, a growing number who took up the study of archaeology had been further educated in the physical and biological sciences. Even now, it is claimed that significant differences can be noted between the work done by professional archaeologists whose undergraduate studies were in the humanities and in the natural sciences (R. Chapman 1979: 121). More recently, a large number of prehistoric archaeologists have been educated in anthropology or history departments, depending on local preferences. In general, archaeologists trained within the context of history remain interested in the pasts of specific countries or peoples, whereas archaeologists trained in anthropology are more likely to be interested in studying the past from a comparative perspective.

The roles played by particularly successful or charismatic archaeologists as exemplars in shaping the practice of archaeology on a national and an international scale also are significant, even if they probably developed their ideas in contexts that were fertile to those ideas. Younger archaeologists may strike off in new directions and pioneer novel techniques of analysis or interpretation in order to try to establish professional reputations for themselves.

Archaeological interpretation also has been influenced by technical developments in the physical and biological sciences. Until recent decades, when collaborative research involving archaeologists and natural scientists became routine, with rare exceptions the flow of information between these disciplines was unidirectional, with archaeologists being the recipients. Hence, research in the natural sciences was only fortuitously related to the needs of archaeologists, although from time to time discoveries were made that were of tremendous importance for archaeology. The development of radiocarbon and other geochronometric dating techniques after World War II provided archaeologists for the first time with a universally applicable chronology that allowed the approximate year as well as the relative order of archaeological manifestations to be determined. These dating techniques also constituted an independent test of chronologies that had been inferred by means of seriation alone or were based on limited textual data. Pollen analysis provided valuable new insights into prehistoric climatic and environmental changes and trace-element analyses added an important dimension to the study of the prehistoric movement of certain kinds of goods. While there is considerable variation in how quickly and insightfully archaeologists apply innovations derived from the physical and biological sciences to their work, once they have been incorporated into archaeological research such innovations tend to spread throughout the world rapidly and with little resistance. The main obstacle to their spread is lack of funds and trained scientific personnel, factors that probably create more disparity between the archaeology of rich and poor nations than any other. Yet even now, when more physical and biological research is being undertaken specifically to solve archaeological problems, discoveries in these fields remain among the least predictable factors influencing archaeological interpretation (Nash 2000a).

The proliferation of electronic forms of data processing has revolutionized archaeological analysis no less than did radiocarbon dating. It is now possible to correlate in a routine fashion vast amounts of data, which in the past only an exceptional archaeologist, such as W. M. F. Petrie, would have attempted to analyze (Kendall 1969, 1971). This allows archaeologists to use the abundant data at their disposal to search for more detailed patterning in the archaeological record (Hodson et al. 1971; Doran and Hodson 1975; Hodder 1978b; Orton 1980; Sabloff 1981) and to explore the test implications of ever more complex hypotheses about human behavior so that these findings can be compared with the archaeological record (Wobst 1974; Mithen 1993; Costopoulos 2002). New theoretical orientations have been encouraged by specific developments of a mathematical nature. General systems theory (Flannery 1968; Steiger 1971; Laszlo 1972a; Berlinski 1976) and catastrophe theory (Thom 1975; Renfrew 1978a; Renfrew and Cooke 1979; Saunders 1980) are both mathematical approaches to the study of change, even if their strictly mathematical aspects have been emphasized less than the underlying concepts in applying them to archaeological problems.

The interpretation of archaeological data also has been significantly affected by the changing theories of human behavior and cognition espoused by the social sciences. It has been especially influenced by concepts derived from ethnology and history, the two related disciplines with which archaeologists have maintained the closest ties. Theoretical concepts derived from geography, sociology, economics, and political science also have influenced archaeology, either directly or through anthropology and history. Yet, because all these disciplines have been shaped by many of the same social movements that have influenced archaeology, it is often difficult to distinguish social science influences on archaeology from those of society at large.

The interpretation of archaeological data is also influenced by established beliefs about what has been learned from the archaeological record. Often specific interpretations of the past are uncritically accommodated to changing general views, rather than carefully scrutinized and assessed, even when these interpretations were formulated in accordance with a general view that has been rejected. Because of this, specific views about the past can persist and influence archaeological interpretation long after the reasoning that led to their formulation has been discredited and abandoned. In their

detailed study of research at the Neolithic site of Avebury in England, Peter Ucko et al. (1991) demonstrated how the uncritical acceptance of older findings has constrained more recent research. Various studies have traced how interpretive motifs derived from classical and medieval Europe have influenced the understanding of early human behavior and how Marcelin Boule's and Arthur Keith's contrasting portrayals of Neanderthals have continued to play a central role in constructing knowledge about them (Moser 1992; Trinkaus and Shipman 1993; Stringer and Gamble 1993). By contrast, David Wengrow (2003: 134) has argued that studying the history of archaeology can contribute to the better understanding of the past and present through reengagement in a new context with ideas long forgotten as a result of what Laura Nader (2001) calls the "collective amnesia" associated with changing research programs. It thus becomes obvious that, although archaeologists' understandings of the past are influenced by the social milieu in which they exist, they also are influenced by many factors that relate to the ongoing development of archaeology as a discipline or set of disciplines. A history of archaeological thought requires knowledge not only of the social setting in which archaeological research is carried out but also of the ongoing development of archaeology as a practice.

Like other studies of the history of science, the history of archaeology is characterized by two broad approaches: internalist and externalist or contextual (Kuhn 1977: 109–10; Bauer 1992: 110–14). Internalist studies trace the discoveries and intellectual debates that have shaped archaeological interpretation. An excellent example of such an endeavor is Donald Grayson's *The Establishment of Human Antiquity* (1983). Internalist approaches continue to be preferred by epistemological positivists and political conservatives. They also are generally accepted as a valid way to study the history of archaeology. Externalist approaches seek to relate changes in archaeological understanding to changes in the social, economic, and political milieus in which archaeology is practiced. Although there is growing interest in such studies in both Western and ex-colonial countries (Klindt-Jensen 1975; I. Bernal 1980; Robertshaw 1990; Patterson 1995; Marchand 1996), conservative archaeologists and historians of science often criticize such interpretations on the grounds that they are speculative and ideologically driven (Daniel and Renfrew 1988: 199). In recent years, however, this sort of approach has acquired

new levels of respectability as a result of Adrian Desmond's (1982, 1989; Desmond and Moore 1992) studies of the social and political implications of biological evolutionism in Victorian England. Moreover, there is a large body of evidence that interpretations are influenced by social milieus. Although it would seem ideal for studies to combine both approaches, in practice few historians of archaeology attempt to do this. I will, however, apply both approaches in this book.

Histories of science also are expected to avoid presentism, which involves judging past developments in terms of the current practices and beliefs of the discipline. This sort of approach evaluates what happened in the past in terms of present concerns and treats the history of archaeology as a chronicle of its progress toward its present state. Presentism is generally regarded by historians of science as a common shortcoming of amateur historians, especially scientists writing about their own disciplines. More sophisticated studies are expected to try to understand past events on their own terms and in relation to past social and political, as well as disciplinary, contexts. Yet Tim Murray (1999b) embraces an "avowedly presentist" approach and Robert Dunnell (2001: 1291) objects that by avoiding presentism historians of archaeology fail to distinguish between scientific discoveries of lasting value and those that are of no importance for the development of the discipline. To be relevant, Dunnell argues, studies of the history of archaeology must be theoretically informed. Thus, his position appears to be an endorsement of presentism.

Archaeological Interpretation

Archaeologists debate whether their discipline, or any social science, can or should be scientific. In part, these debates arise from disagreements about what constitutes science and scientific behavior. Most historians and philosophers of science trace the origin of modern science back to the philosopher Francis Bacon and regard it as a method of knowing rather than a body of knowledge. Bacon sought to persuade scholars to cease relying on revealed or authoritative knowledge to understand the world and instead to employ observation, classification, comparison, and where possible experimentation to achieve this goal. In this way, scientific knowledge was made the

ever-developing product of communities of researchers (Zimmerman 2001: 117).

It is a fundamental tenet of science that nothing is significant by itself but only in relation to hypotheses; hence only theories can explain phenomena (Dunnell 1982b; Bird 2000: 18). Scientists must search for order, most often in the form of systemic properties, that facilitates the construction of explanations, without subjecting themselves to any *a priori* limiting presuppositions about the general extent or nature of that order. Their goal is to discover mechanisms that account for how things work and have come to be as they find them (Bunge 1997).

A scientific viewpoint treats the idea of absolute, unchanging truth as a dangerous and absurd illusion. Although scientists seek the most comprehensible and enduring understanding that their data permit, they acknowledge that they are unable to transcend the limitations of their data and what they are capable of perceiving at any particular point in time. Hence, they expect that in due course every scientific theory will be altered and probably become outmoded. Scientists are professionally obligated to test every theory against new evidence and to ensure that no theory logically contradicts any other accepted ones (Klejn 2001a: 86). Contrary to Karl Popper's (1959) argument that theories can only be disproved rather than proved, the philosopher of science Mario Bunge (1996: 180–3) argues that, because even the refutation of a theory is not necessarily definitive, scientists are justified in supporting a likely theory until convincing evidence to the contrary emerges. It is also now widely accepted that the processes of recovering and analyzing data are generally no less biased than is their explanation.

There is no fundamental disagreement between this position and relativist claims that science is an ensemble of social practices that seek to make the world and human behavior meaningful and intelligible; that science is embedded in society; and that its claims are at best partial, negotiated, and contested positions about what is to be taken for granted (Shanks 1996: 103), provided that it is also recognized that archaeological data were created independently of archaeologists and therefore have the capacity to resist their interpretations (Wylie 1982, 1989b, 2002; Trigger 1989b, 1998b). Kristiansen (2002) argues that archaeologists must regard such observations not as invitations to cultivate subjectivity but as a challenge to try hard to be objective.

Science presupposes a commitment to use more than rhetoric, persuasion, and political power or academic authority to recruit support for a position.

Jean-Claude Gardin (1980: 4) identifies the goal of archaeology as being to create intellectual constructions relating to the study of objects of all sorts that originated in the past. Leo Klejn (2001a: 88) defines archaeology as a discipline constructed by theories related to the study of material culture and antiquity. Lynn Meskell (2002: 293) observes that what sets archaeology apart from history and anthropology is its materiality. Yet David Wengrow (2003: 134) identifies it with an improved understanding of human behavior and history, whereas others have suggested that its goal should be to generalize about processes of cultural change (Binford 1962, 1983b). These perspectives are not antithetical. Archaeology is based on recovering and studying material culture but that does not prevent archaeologists from trying to study past human behavior, any more than palaeontologists are precluded from trying to understand the behavior of prehistoric animals. Today, there is a growing tendency to view archaeological theory as a subset of anthropological (or social science) theory dealing with how human behavior and beliefs are related to material culture and how material culture influences human behavior.

Scientific theory is a form of generalization that addresses how things work and change. Theories generally promote an understanding of one realm or dimension of reality by ignoring others. They do not seek to analyze the world as it is observed but through what are judged to be appropriate categories (Hegmon 2003: 213). To account for a specific situation, it is necessary to combine various explanations of this sort to form an explanatory argument (Roberts 1996). As a result of increasing relativism, there is growing interest in how knowledge is constructed, including how archaeologists evaluate knowledge claims and reach conclusions. This has produced a growing concern with archaeological theory even if many archaeologists, including archaeological theorists, believe that the close relations between theories and practice cast doubt on the desirability of establishing a separate subdiscipline of theoretical archaeology.

Archaeology is a social science in the sense that it tries to explain what has happened to specific groups of human beings in the past. Yet, unlike ethnologists, geographers, sociologists, political scientists, and economists, archaeologists cannot observe the behavior of

the people they are studying and, unlike historians, most of them do not have direct access to the thoughts of these people as recorded in written texts. Instead, archaeologists must conjecture human behavior and ideas from the material remains of what human beings have made and used and the lasting physical impact of their activities on the environment. The interpretation of archaeological data depends on an understanding of how human beings behave at the present time and particularly of how this behavior is reflected in material culture. Archaeologists also must invoke uniformitarian principles in order to use an understanding of geological and biological processes going on at the present time to infer how natural processes have helped to shape the archaeological record. Yet they are far from agreed how such understanding can be applied legitimately and comprehensively to derive an understanding of past human behavior from their data (Binford 1967a, 1981; Gibbon 1984; Gallay 1986).

For a long time, most archaeologists were naive empiricists, offering what appeared to be plausible explanations for the evidence they were recovering. Then, in the 1960s, processual archaeologists embraced a positivist epistemology that emphasized establishing general regularities between observable phenomena and explaining these regularities. They also treated explanation and prediction as equivalent. This approach favored studying behavior, as it privileged what can be witnessed instead of dealing with more elusive thoughts and motives. It also privileged methodological individualism and because it doubted the epistemological validity of emergent properties was reductionist. It therefore promoted a belief in a "unified science," which sought to apply methodologies derived from the physical sciences to study everything (Hempel and Oppenheim 1948; Hempel 1965). Postprocessualists, and still earlier archaeologists such as R. G. Collingwood, embraced an opposing idealist epistemology that maintains that perceptions only acquire meaning as a result of discriminations that occur in the observer's mind. Idealists therefore believe that concepts play an important role in determining perception: humans do not adjust to the world as it really is but to the world as they imagine it to be. Idealism thus emphasizes the value of a cultural rather than a behavioral approach to understanding human activities (Collingwood 1946; Barnes 1974; Laudan 1990). Postprocessualists object that positivists ignore the cognitively mediated nature of human behavior and hence downplay the importance

of culture. Positivists maintain that, because of its wholly subjective nature, the hermeneutic method does not provide a scientific approach for the study of beliefs. Each of these approaches is the formalization of a way of gaining a type of knowledge that is vital for everyday human living. Positivism relates to the sort of knowledge that is necessary to adapt to the natural world and idealism to what is required to interact with other human beings.

The inadequacies of both positivism and idealism as epistemologies for the social sciences have promoted the popularity of a third option: realism (Bhaskar 1978; Harré 1970, 1972; Harré and Madden 1975; Bunge 2003). Mario Bunge (1996: 355–8) maintains that realism is the epistemology that all reasonable and productive scientists actually follow, whatever epistemology they advocate. Realists identify the object of scientific study as being not only what can be perceived with the senses or conceptualized in the brain but all that exists and happens. Thus, realists pay equal attention to all things, whether they can observe them or only their effects. Ideas are viewed as processes that occur in the human brain and hence can be studied from a materialist perspective. Realists maintain that some imperceptible entities are appropriate objects of study. Thus, they do not confine themselves to appearances, as positivists do, but they also do not make common cause with idealists in belittling the significance of appearances. Often they begin with appearances and try to explain them by postulating unobservable entities, as Gregor Mendel did when he proposed that what are now called genes were necessary to explain the results of his interbreeding of different varieties of garden peas. Because it accepts the validity of studying structures as well as entities, realism is antireductionist. As a result of acknowledging the complexity of the real world, it also rejects the positivist equating of explanation and prediction.

Generalizations, which can concern both patterns and the mechanisms that account for patterns, play a role in all scientific operations relating to the collection, description, classification, and interpretation of data. Archaeologists follow the example of philosophers of science (Nagel 1961) and other social science disciplines in classifying their generalizations into high, middle, and low categories (Klejn 1977; Raab and Goodyear 1984) (Figure 1.1). Only middle- and high-level generalizations count as hypotheses or theories, according to the extent of their confirmation, because they alone propose mechanisms
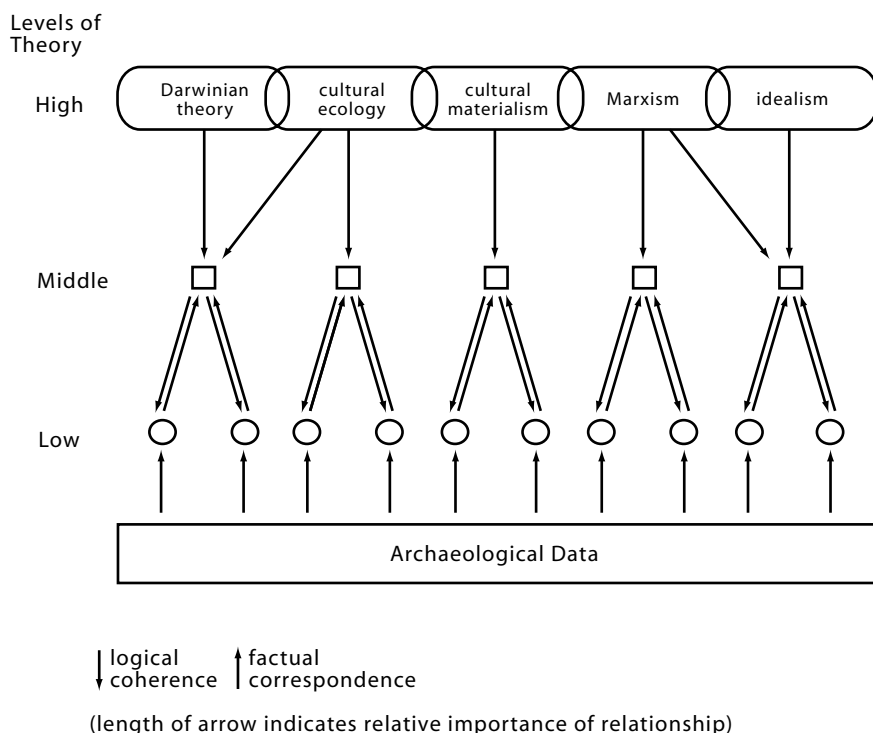
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Levels of
Theory

Figure 1.1 Relations between levels of generalization

that account for why things are as they are and change as they do in multiple instances.

Low-level generalizations seek to discover patterns in archaeological data (Klejn 1977: 2). These patterns appear to be the same as Ernest Nagel's (1961: 79–105) experimental laws, of which he offers as an example the proposition that all female whales suckle their young. Such generalizations are normally based on regularities that are repeatedly observed and can be refuted by the observation of contrary cases. The vast majority of generalizations on which higher-level archaeological interpretations are based are empirical ones of this sort. They include most typological classifications of artifacts; the delineation of specific archaeological cultures; the demonstration by means of stratification, seriation, or radiocarbon dating that one archaeological manifestation dates earlier, or later, than another; and the observation that in an individual culture all humans are buried in

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a particular position accompanied by specific types of artifacts. These generalizations are based on observations that specific attributes or artifact types occur repeatedly in a particular association with each other, correlate with a specific geographical locality, or date to a certain period. The dimensions of such generalizations are the classical ones of space, time, and form (Spaulding 1960; Gardin 1980: 62–97). Archaeologists also may assume that specific types of projectile points served particular functions and that each archaeological culture was associated with a specific people. These inferences, which refer to human behavior, differ substantially from generalizations that are based on empirical observations of correlations between two or more categories of archaeologically tangible data and do not constitute examples of low-level generalizations. In many instances, the behavioral assumptions turn out to be incorrect, unproved, or misleading (Hodder and Hutson 2003: 173–5).

Because of the nature of archaeological data, low-level generalizations never refer to human behavior. They only reveal correlations between one sort of archaeological observation and another, thus providing evidence of hitherto unnoticed patterning or ordering in archaeological data. These empirical observations never provide explanations but constitute patterns that require explanation. Discovering generalizations of this sort is the most time-consuming and arguably the most productive activity in which archaeologists engage. Yet, from a theoretical perspective, it is the least studied of archaeological activities. Most historical work of this sort has been done by archaeologists interested in classification and seriation and by logicists (Gardin 1980: 10; Malina and Vašíček 1990: 149–209).

Middle-level theories have been defined as generalizations that attempt to explain the regularities that occur between two or more variables in multiple instances (Raab and Goodyear 1984). Such generalizations can be produced either by refining high-level theories so that they are applicable to specific data sets (such as archaeological data) or by seeking to provide an explanation for why certain low-level generalizations occur in multiple instances. All social science generalizations should have cross-cultural validity and also make some reference to human behavior. In addition, they must be sufficiently specific that they can be tested by applying them to particular sets of data. An example of a middle-level anthropological generalization is Ester Boserup's (1965) proposition that among agricultural

economies increasing population pressure leads to situations that require more labor for each unit of food produced in order to derive more food from each available unit of arable land. This theory would be archaeologically testable if archaeologists could establish reliable measures of absolute or relative changes in population, the labor-intensiveness and productivity of specific agricultural regimes, and a sufficiently precise chronology to specify the temporal relationship between changes in population and food production. Doing this would require elaborating what Lewis Binford (1981) calls middle-range theory, which attempts to use ethnographic data to establish reliable correlations between archaeologically observable phenomena and archaeologically unobservable human behavior. Although "middle-level" and "middle-range" theories are not identical, in that middle-level theory can refer exclusively to human behavior, whereas middle-range theory must by definition refer to both human behavior and archaeologically observable traits, all Binford's middle-range theory can be regarded as a special type of middle-level theory. Middle-range theory is vital for testing all middle-level theory relating to archaeological data.

High-level, or general theories, which Marvin Harris (1979: 26–7) has called "research strategies" and David Clarke (1979: 25–30) labeled "controlling models," have been defined as abstract rules that explain relations among the theoretical propositions that are relevant for understanding a major field of knowledge. Darwinian evolutionism and more recently the synthetic theory of biological evolution, which combines Darwinian principles with genetics, are examples of general theories relating to the biological sciences. In the human domain, general theories exclusively relate propositions about human behavior to one another; hence, there are no theoretical formulations at this level that pertain specifically to archaeology rather than to the social sciences in general. This is true even of theories that relate human behavior to material culture. Examples of rival high-level theories that currently influence archaeological research are selectionism, cultural ecology, cultural materialism, and historical materialism (Marxism). These are all materialist approaches and overlap to varying degrees. In recent years, there has been a resurgence of interest in high-level theories that attempt to explain human behavior in terms of cultural beliefs or underlying cultural structures. Such theories share an idealist approach. Still other theories, such as

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neo-Marxism, bridge the gap between materialist and idealist high-level positions creating a broad spectrum of high-level social science theories.

Because high-level theories attempt to interrelate concepts about human behavior rather than to account for specific observations, they cannot be confirmed or falsified directly (M. Harris 1979: 76). In that respect, they resemble religious dogmas. Their credibility can, however, be influenced by the repeated success or failure of middle-level theories that are logically dependent on them. Yet such testing is anything but straightforward. Although many middle-range theories may have significance for distinguishing between materialist and idealist modes of explanation, the complexity of all human behavior and its symbolically mediated nature create much opportunity for obfuscation. Social scientists exhibit great ingenuity in dismissing results that do not agree with their presuppositions as exceptions or even reinterpreting them as likely confirmation of what they believe. As the result of a growing appreciation of the role played by ideas in influencing human behavior, many Marxists have shifted from a purely materialist to a more idealist view of human behavior. Sometimes this new position is distinguished as neo-Marxism, sometimes it is not (McGuire 1993; Trigger 1993). Likewise, in recent years, many cultural ecologists have shifted from a more deterministic to a less deterministic position. The overlapping nature of high-level theories of human behavior provides considerable opportunities for such intellectual gymnastics. It is still more difficult for archaeologists to assess the relative utility of the various materialist positions listed above. Tests of Boserup's middle-level theory have implications for both cultural materialism and cultural ecology and hence would be of little use for assessing the relative utility of one or the other. The failure of middle-level theories to confirm preferred high-level ones also can be dismissed as the result of inadequate or inappropriate data rather than accepted as casting doubt on high-level propositions.

Because of the indirectness of tests, the rise and fall in the popularity of specific high-level theories seems to be influenced more by social processes than by the scientific examination of logically related middle-level theories. Between 1850 and 1945, a strong emphasis was placed on biological, and more specifically racial, explanations of variation in human behavior. Scientific demonstrations that

explanations of this sort did not hold in specific instances were inadequate to undermine the faith that many scholars had in the general validity of a racist approach (M. Harris 1968a: 80–107). Yet racial and, for a time, almost all biologically based theories were abandoned as scientific explanations of human behavior following the military defeat of Nazi Germany in 1945 and the consequent revelation of the full extent of its racist-inspired atrocities. It often has been observed that materialist theories tend to flourish in the social sciences when middle-class intellectuals feel secure, whereas idealist ones are espoused during periods when economic and social upheaval create uncertainty (Engels [1868] in Marx and Engels 1964: 263–8).

Archaeologists generally accept, mostly implicitly, that scientific explanations are subject to two types of verification (Lowther 1962; Kosso 2001). The first test is that of correspondence truth. This test seeks to determine if an explanation corresponds to the facts. It is useless to suggest that a drought accounts for the collapse of centralized political control in an early civilization if no evidence of a drought can be produced. The second test is that of coherence truth: whether or not an argument is logically consistent. Over two and a half millennia, rationalist philosophers have developed logic as a powerful tool for detecting flaws in explanations. Few archaeologists have studied formal logic, but they enjoy discovering logical flaws in one another's arguments as a way of discrediting both unwelcome theories and academic rivals. Complex arguments are needed to cope with phenomena relating to human behavior. Political collapse might result from a severe famine but only if a society lacks stored surpluses or access to alternative sources of food. Hence, monocausal explanations are rarely, if ever, adequate in the social sciences. Moreover, the same effect may result from a number of different causes: a breakdown in normal patterns of succession to high leadership also might result in political collapse. This is a situation known as equifinality.

Ideally, it should be possible to establish a logically coherent relationship among high, middle, and low levels of theory and a factual correspondence between middle- and low-level generalizations and observable evidence. Because low-level generalizations are empirical in nature, coherence tests do not apply to the relations between them and evidence, whereas, as we have already noted, factual correspondence rarely serves as a direct test of high-level theories. American

archaeologists have fiercely debated whether middle-level theory ought to be derived deductively as a coherent set of interrelated concepts from high-level theories or whether it also can be constructed inductively from evidence and low-level generalizations. Those who support the deductive approach argue that explanations of human behavior, as opposed to empirical generalizations about it, should be based on covering laws stated as hypotheses and tested against independent sets of data (Watson et al. 1971: 3–19; Binford 1972: 111). They seek to establish explicit, logical connections between high- and middle-level theory. Generally, however, they underestimate the tenuous, complex, and intractable nature of the relations between these two levels. By contrast, because high-level theory is hard to verify, highly susceptible to subjective influence, and not absolutely required to create middle-level theories, many inductivists regard the creation of high-level theories as an ultimate goal that archaeologists should address only after they have established a large corpus of reliable generalizations at the middle level (M. Salmon 1982: 33–4; Gibbon 1984: 35–70; Gallay 1986: 117–21). In keeping with what they regard as the Baconian tradition of science, inductivists also maintain that, although deductive research cannot go beyond confirming or disproving existing theories, an inductive approach has the potential for making genuinely new discoveries about aspects of human behavior. They also believe that an inductive approach is superior because it is grounded on evidence collected without presuppositions. Yet it is evident that theories are not derived from evidence but imposed on it.

The debate whether explanations are better produced by induction or deduction poses a false dichotomy. Observations that Charles Darwin made in the course of a five-year voyage around the world led him to doubt whether creationism could best account for the geographical distributions of various species of plants and animals. For over two decades he collected vast amounts of information on variations within and between different species. Yet, according to his own account, the concept of natural selection occurred to him not as a direct result of his research but as a consequence of his reading the economist Thomas Malthus's (1798) theory that the main cause of human suffering is the natural tendency for human population increase to outrun the available food supply. Once the theory of natural selection had occurred to Darwin, he was able to use the data

he had collected to present convincing arguments in support of his idea. Both induction and deduction played significant roles in the development of the theory of natural selection and continue to do so in the creation of all scientific theories. The credibility of all scientific theories depends on their maintaining logical coherence with other relevant theories and satisfactory correspondence with relevant evidence. Because numerous implicit assumptions about the nature of human behavior color what is believed to be any sound explanation of archaeological data, high-level concepts can be ignored only at the risk that implicit ones will unwittingly distort archaeological interpretations. Successful theory-building involves the combining of both approaches.

Archaeologists also disagree about the formal nature of the generalizations that they seek to elaborate. Processual archaeologists assumed that all laws must be universal in nature. They also believed these laws to be primarily ecological, although today archaeologists are deriving a growing number of such generalizations from evolutionary psychology, neuroscience, and biology. Such laws relate to variables that are assumed to hold true regardless of the temporal period, region of the world, or specific cultures that are being studied. These generalizations vary in scale from major assumptions about historical processes to regularities dealing with relatively trivial aspects of human behavior (M. Salmon 1982: 8–30). A good example of this sort of approach is formalist economics, which maintains that the rules used to explain the economic behavior of Western societies explain the behavior of all human beings. Such an approach accounts for significant variations in human behavior in different societies by viewing them as the results of novel combinations and permutations of a fixed set of interacting variables (Burling 1962; Cancian 1966; Cook 1966). Universal generalizations are frequently interpreted as reflecting an invariant human nature.

Other archaeologists maintain that universal laws concerning human nature are relatively few in number and that most cross-cultural generalizations apply only to societies that share the same or closely related modes of production. This position is similar in general orientation to that of the economic substantivists. In contrast to formalists, substantivists maintain that the rules, as well as the forms, of economic behavior are fundamentally transformed by evolutionary processes (Polanyi 1944, 1966; Polanyi et al. 1957; Dalton 1961).

The substantivist approach implies that novel properties can and do emerge as a result of sociocultural change (Childe 1947a). This distinction between universal generalizations and more restricted ones may not be as far-reaching or absolute as its proponents maintain. Generalizations that apply only to specific types of societies can be rewritten in the form of universal generalizations, whereas universal ones may be reformulated, usually in greater detail, so that they apply specifically to a particular class of society. Yet those who stress the importance of restricted generalizations argue that all or most of them cannot be transformed into universal generalizations without a severe loss in content and significance (Trigger 1982a).

The third type of generalization is specific to an individual culture or to a single group of historically related cultures. Examples would be the definitions of the canons that governed ancient Egyptian or classical Greek art (Childe 1947: 43–9; Montané 1980: 130–6). Such generalizations are potentially very important inasmuch as most cultural patterning is probably of this sort. Yet, where no culturally specific meanings can be applied to such patterns, they remain at the level of empirical generalizations.

Challenge

A final question is whether a historical study can measure progress in the interpretation of archaeological data. Are steady advances being made toward a more objective and comprehensive understanding of archaeological findings, as many archaeologists assume? Or is the interpretation of such data largely a matter of fashion and the accomplishments of a later period not necessarily more comprehensive or objective than those of an earlier one? Answering this question is vital for considering whether the development of archaeology does or does not promote greater objectivity in its findings.

In examining the patterns that have characterized the interpretation of archaeological data, I shall attempt to ascertain to what extent archaeological techniques as well as a general understanding of human history and behavior have been irreversibly altered as a result of archaeological activity. There is evidence of some linearity in the development of archaeology as, for example, with the continuing relevance of the principle of stratigraphy, of frequency seriation, and of Ian Hodder's (1982b) demonstration that material culture

can play an active as well as an epiphenomenal role in social processes. Yet there is no evidence that archaeologists at any one period are less influenced by subjective beliefs and social circumstances than they are at any other. In addition, contingent factors, personalities, academic policies, sheer ignorance, professional biases, and funding all influence the acceptance and application of new ideas and techniques (Nash 2000b: 208). It is possible, however, that archaeological interpretation, although initially highly subjective, becomes less influenced by social biases and less susceptible to political manipulation as the archaeological database becomes more abundant, and, therefore, that an understanding of the past grows more objective as more archaeological research is carried out. That trend would accord with the claims of moderate relativists that archaeological evidence has the capacity to limit speculation about the past. If archaeological interpretations are wholly, or even largely, subjective, we should not be able to discover many significant long-term patterns but only random variations brought about by changes in the economic, social, and intellectual milieu. If evidence plays a role in limiting speculation, the development of archaeology should be increasingly constrained by knowledge that belongs to the discipline, even if subjective factors continue to influence significantly the answers to what are regarded at any given time as interesting questions. If archaeological evidence plays a significant role in shaping an understanding of the past, the study of ontology, in particular of the factors that constrain human behavior, will become as – if not more – important than learning about epistemology, or the nature of understanding, for the future development of our discipline. That would reverse a trend that has prevailed since the 1960s or even the 1930s. By learning more about how archaeological questions are answered over time, we may hope to gain additional insights into the objectivity or subjectivity of archaeological interpretations; to what extent archaeology can be more than the past relived in the present, in the sense Collingwood defined that process; and the degree to which any sort of understanding can be communicated from one age or culture to another.