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Abstract

Social evolution can be defined as the appearance of new forms of social or sociopolitical organization. In the case of the prehistoric record, such changes are perhaps most successfully studied when archaeologists collaborate with ethnologists or ethnohistorians. Although ethnologists can provide unequaled detail on agents and institutions, many evolutionary transitions took longer than any ethnologist's lifetime. The archaeological record therefore provides an important proving ground for evolutionary theory. In this review, I synthesize some of the evidence supporting social evolution from both Old World and New World archaeology. I also argue that for the study of social evolution to advance, the field of anthropology must be willing to generalize; to compare and contrast cultures from different parts of the world; and to search for common patterns in the ways human societies responded to similar challenges.

THE ARCHAEOLOGICAL EVIDENCE FOR SOCIAL EVOLUTION

Studies of sociocultural evolution began in the mid-nineteenth century (Morgan 1870, 1877; Spencer 1851, 1857, 1863; Tylor 1870, 1889). These studies were necessarily based on limited and anecdotal ethnographic data from disparate parts of the world. Early evolutionists could not resist proposing terms such as "savagery," "barbarism," and "civilization" for stages of sociocultural development—terms that would not survive the advent of professional anthropology. A second wave of evolutionists (Carneiro 1970; Fried 1967; Sahlins & Service 1960; Service 1960, 1962; Steward 1948, 1949, 1953, 1955) could base their controlled comparisons on richer and more systematically collected ethnographic data. These data began to be compiled in 1949 to form the Human Relations Area Files, a source that continues to yield important results (Bondarenko & Korotayev 2000, Ember 1973, Ember & Ember 1995, Goodenough 1999, Kamp 1998, Peregrine 2001, Peregrine et al. 2004).

In its latest incarnation, evolution is seen as multilinear and can even be divided into topics such as cultural evolution, social evolution, and ethnogenesis. The term cultural evolution is sometimes applied to the divergence of distinct cultures from a common ancestral background, such as occurred when many Polynesian islands were colonized from a "Samoa-Tonga homeland region" (Kirch & Green 2001). The term ethnogenesis is sometimes used when a recognizable ethnic group seems to emerge in the archaeological record, for example, when arguably Eskimo societies began to appear in the Canadian Arctic during the prehistoric Dorset and Thule periods (Maxwell 1984, McGhee 1984).

Social evolution, the focus of this article, can be defined as the appearance of new forms of social or sociopolitical organization, without necessarily implying changes in overall culture or ethnicity. Nearly 50 years ago, Sahlins (1960) identified two modes of social evolution: specific and general. Specific evolution—by far the most common mode—refers to the small changes that take place over the lifetime of a society, without necessarily transforming it into a larger, more centralized, more hierarchical society. For example, a foraging society with bilateral kinship terms might grow in population to the point at which it became subdivided into multiple clans, reckoning descent unilineally; in every other way, however, it might remain an egalitarian, seminomadic foraging society.

Occasionally, however, what seems initially like a small change can have more profound long-term consequences. For example, should the society described above wind up with multiple clans, one of which emerges as hierarchically above the others—able both to provide leadership to the others and to demand unique privileges—what could result is a foraging society based on rank, like the Calusa of Florida or the Tlingit and Nootka of the Pacific Northwest. Such change, although specific to the group involved, could be considered general not only because it resulted in a more complex society, but also because it can be usefully compared and contrasted with the origins of social hierarchy elsewhere in the world. Despite the fact that general evolutionary change is the less common of the two modes, it remains the one that has most captured archaeologists' imaginations.

When general evolutionists need to ensure that their controlled comparisons and contrasts are being carried out on societies of the same level of complexity or sociopolitical integration, they have tended to create shorthand terms for different social forms or types. No aspect of evolutionary theory is more misunderstood than these social types. They have been attacked as rigid even when they are not, as stages even when they are not, and as unilinear even when they are not.

Sumner & Keller (1927–1928), Wright (1983), Spencer (1990, 1993, 1997), Carneiro (2003), and others have presented cogent arguments showing that some kind of social typology is necessary to facilitate comparisons and

contrasts. By way of analogy, imagine the problems that would result if zoologists were forbidden to create categories such as "amphibian," "reptile," and "mammal" and were limited instead to calling every creature "an animal." To carry that analogy further, consider how silly it would be to accuse "reptile" of being a rigid category when we all know it to include creatures as different as snakes, lizards, and turtles, not to mention fossils described as mammal-like reptiles.

THREE REQUIREMENTS OF EVOLUTIONARY THEORY

Wright (1983) proposes three requirements for any social evolutionary theory. First, it must involve "a typology of social forms which *potentially* has some kind of directionality to it" (p. 26, emphasis in original). Second, it must be possible to order these forms of society "in such a way that the probability of staying at the same level of the typology is greater than the probability of regressing." Third, there must be "a positive probability of moving from a given level of the typology to the next higher level."

Wright adds that we must not assume that any society will evolve, regress, or move through a rigid sequence of stages, explaining that "long-term steady states may be more likely than any systematic tendency for movement" (p. 26). This statement is particularly relevant to archaeology because it is long-term steady states that archaeologists tend to recognize as periods or phases in prehistoric sequences. All too often, crucial evolutionary changes appear to have taken place in the much briefer transitions between periods, transitions so rapid as to be nearly unrecognizable at the chronological scale of most archaeology. This is one reason that archaeologists find it so difficult to respond to ethnologists' demands to give more weight to agency in their explanatory schemes. Most chronological periods used by archaeologists are ten times the adult life of an agent. Small wonder that most archaeologists refer to processes, which represent the amalgamated behaviors of multiple agents.

Archaeologists are well aware of such problems and are working on them. To do so, they need to maintain an ongoing dialogue with ethnologists and ethnohistorians, for whom agents are in sharper focus. This collaboration has become increasingly difficult owing to many current anthropologists' antipathy toward generalization, controlled comparison, and the search for universal patterns. Significant exceptions to this trend can be found among social scientists in the former Soviet Union (Artemova 2003, Bondarenko & Korotayev 2003, Grinin et al. 2004, Korotayev 2003, Kradin et al. 2000, Kradin & Lynsha 1995), who not only continue to pursue evolutionary approaches but have even created a new journal, *Social Evolution and History*. Although these scholars welcome constructive criticism of evolutionary archaeology, they also have had no trouble dismissing what they call "the most radically negative attitude to this scheme" (Bondarenko et al. 2004, p. 17). By and large, the archaeologists who spend the most time engaged in active fieldwork seem to have the fewest doubts that social evolution of some kind has taken place, a point to which I return in my conclusions.

THE ROLE OF ARCHAEOLOGY

As suggested above, the study of social evolution should involve collaboration among ethnologists, ethnohistorians, and archaeologists. Each subdiscipline has its role, its strengths, and its weaknesses.

The relationship between ethnology and archaeology is analogous to that between zoology and vertebrate paleontology. Zoologists are able to study both muscle tissue and behavior at a level of detail unavailable to paleontologists. Paleontologists, however, can find the muscle attachments on fossil bones that provide evidence for specific muscles; they can then draw on the zoological literature both on those muscles and on the behavior they reflect. Paleontologists can also elucidate long-term trends and recover the skeletons of transitional species unknown to zoology; such fossils show us the order in which certain structures (and hence

behaviors) arose. In an important sense, the fossil record is the proving ground for any theory of change based on comparisons of living species.

The study of social evolution also works best when students of living and fossil societies collaborate. Unfortunately, such collaboration often reveals one of archaeology's weaknesses: It deals with the residues of behavior rather than directly observed behavior. As a result, archaeologists do not really recover types of societies; they recover the residues of social institutions. Fortunately, it is the clusters of social institutions that allow us to reconstruct social forms. What archaeologists must do is patiently accumulate evidence for sets of social institutions (and their associated personnel) until they can make a convincing case for a particular type of society.

A decade ago, Flannery and I argued that for some parts of the world, one could present a kind of "evolution without stages"—a history of change in which emerging social and political institutions, rather than stages, provided the milestones along the way (Marcus & Flannery 1996, p. 236). We further argued that "transition periods—those brief phases of rapid evolution during which the system changed, or the actors deliberately changed it"—might be more crucial to evolutionary analysis than the long, stable periods used for so many social typologies. Here archaeology's long-term perspective is one of its strengths. Archaeologists can observe change over periods many times longer than the lifetime of an ethnologist. The empirical data of archaeology can also provide checks on the accuracy of ethnohistoric documents.

In the remainder of this paper I travel through the archaeological record in chronological order, from the Late Pleistocene until the appearance of the earliest states in the Old and New Worlds, providing a sample of the available archaeological evidence for emerging social institutions. This evidence, much of which has been radiocarbon dated, should make it clear why only the most armchair of archaeologists dispute the existence of social evolution. Fieldworkers—excavating in areas such as the Near East, China, Europe, Mesoamerica, the Andes, or Eastern North America—have seen with their own eyes the evidence for specific and general evolution.

HUNTERS AND GATHERERS

According to one widely held view, our "modern" ancestors left Africa at least 80,000–60,000 years ago, eventually spreading to every major land mass (Mellars 2006). Humans began as hunters and gatherers. By 20,000 years ago, however, at least some of them had adopted a "delayed return" economic strategy that involved various combinations of storage, game management, encouragement of wild plants, and exchange systems that linked human groups into larger symbiotic networks (Woodburn 1988). Eventually, some of these strategies would lead to sedentism, some to agriculture, and some to both.

Archaeologists have frequently used the word "band" to refer to the organization of mobile hunting-gathering groups. An increasing number of ethnologists who work with foragers, however, actually prefer the word "camp." Seldom, they argue, is there a definable "band" that moves from place to place as a group. Fluidity is one of the hallmarks of foragers, and even when a specific camp is occupied repeatedly over several years, it is rarely occupied by the exact same group of people.

A useful evolutionary distinction is the one made by Kelly (2000) into unsegmented vs segmented societies. Kelly points out that hunter-gatherers with no level of organization beyond the local group, relatively impermanent extended families, and little tendency to form segments such as lineages and clans are essentially warless. They may have individual homicides (and capital punishment for them), but group violence is rare. This may explain why there is so little archaeological evidence for group violence in the Old World prior to 15,000 BC and the New World prior to 4000 BC.

The case is different, Kelly notes, among societies divided into equivalent segments, such as patrilineal, matrilineal, or ancestor-based

cognatic descent groups, which combine to form progressively more inclusive units. Such segmentary societies display a principle Kelly calls social substitutability: The killing of any member of a segment is considered a group offense and can be avenged by the killing of any member of the offender's segment. Raiding thus began as group versus group social action.

To be sure, archaeologists cannot expect to directly detect changes in social attitudes, such as the principle of social substitutability. What they must try to do is detect the cooccurrence of three social features that are linked in Kelly's model: (*a*) social segments; (*b*) intercommunity raiding; and (*c*) bridewealth, which may join (or replace) bride service when marriage partners are exchanged between social segments. The convergence of these three variables indicates that a society with social substitutability likely exists. Let us now look at some archaeological evidence.

DETECTING EARLY SEGMENTARY SOCIETIES

Perhaps the oldest known archaeological evidence for group violence (and thus for an early segmented society) comes from Jebel Sahaba in the Nile Valley (Wendorf & Schild 2004). Dated by radiocarbon to 15,000 years ago (substantially older if the dates are calibrated), the site consists of 58 burials—men, women, and children—half of whom died violently in a series of ambushes. Some had between 15 and 30 projectile elements embedded in them, a form of homicide Kelly calls "pincushioning." Wendorf & Schild point out that Jebel Sahaba is situated in an area with multiple groups or segments of hunter-gatherers. These foragers evidently competed for localized resources in embayments along the Nile and maintained separate cemeteries, a fact that reinforces our impression of intergroup or intersegment competition.

Although some segmentary societies remained foragers (the aboriginal Australians are a classic example), it was with the growth of population following the origins of agriculture that segmentary societies truly exploded in number. The creation of cemeteries for a corporate segment's dead, already mentioned, can be one archaeological clue. Another clue would be the construction of defensive works, such as ditches or palisades, in response to group-versus-group violence. As mentioned earlier, Kelly also suggests that with the exchange of marriage partners between segments, bridewealth may join or replace bride service. A third clue to social segmentation might therefore be the circulation of goods that could have served as bridewealth.

Archaeologists have found evidence for all three institutions. For example, Tell Maghzaliyah, a Prepottery Neolithic village in northern Iraq, had a stone-and-clay defensive wall (Bader 1993). San José Mogote, an Early Formative agricultural village in southern Mexico, had a palisade of pine posts (Flannery & Marcus 2003, 2005). The latter site also had small cemeteries that may have served different social segments. Any search for possible evidence of bridewealth begins with the brisk trade in marine mollusk shells that characterized so many Late Paleolithic–Early Neolithic societies. The Natufian collectors of wild wheat and barley, who stood on the threshold of agriculture in the Levant, decorated their heads, arms, and ankles with dentalium shells. Mexico's earliest villagers circulated pearl oyster and spiny oyster shells over thousands of square kilometers. The challenge facing archaeologists is to prove that some of this shell was accumulated for bridewealth rather than for mere ornamentation—for example, by demonstrating its association with women of marriageable age.

Service (1962) originally referred to village-based segmentary societies as "tribes." He did not object a few years later, however, when Fried (1966, 1967) abolished the term, in part because it meant different things to different people. This left archaeologists without a term for egalitarian village societies that were organized into lineages, clans, and (sometimes) moieties. Today, many of us follow Townsend (1985, p. 142) and Carneiro (1987, p. 761) in calling these "politically autonomous village

societies," meaning that each controlled its own sociopolitical affairs despite its economic links to other villages.

DETECTING THE INSTITUTIONS OF EGALITARIAN VILLAGE SOCIETIES

"Neolithic" societies (*sensu latu*) displayed almost bewildering variation worldwide. That occurred, almost certainly, because there were so many strategies to accomplish the same thing. Societies without strong centralized authority tend to rely heavily on a combination of kinship and achieved status to determine leadership, and there were multiple ways to do this. Village organization often depended on creating opposable segments, then bringing them together via rituals emphasizing common descent, for which there can be countless versions.

In prehistory, such societies might build nuclear family houses (e.g., in Early Formative Mexico), extended family houses (e.g., in the Near East), or multifamily long houses (e.g., in the Bandkeramik culture of Europe). Some village societies also began to build ritual structures, too varied to list under one rubric. At San José Mogote in Mexico there were small lime-plastered buildings that may be men's houses of the "exclusionary" type, that is, too small to accommodate more than an initiated minority of the men (Marcus & Flannery 2004). At Pessejik Depe in Neolithic Turkmenistan (Berdyiev 1968), there were larger "cult buildings" that could have accommodated most of the village's men and were probably less exclusionary.

Some of the most interesting (and precocious) early public buildings are those of Pre-Pottery Neolithic Turkey. The oval, semisubterranean "shrines" at Göbekli Tepe (Schmidt 2006), with their elaborately carved stone pillars, invite comparisons with the most elaborate painted kivas of the U.S. Southwest. One of the stone masonry "cult buildings" at Nevali Çori (Hauptmann 1993), which features sitting benches and accumulations of ancestors' skulls, seems as persuasive an example of a men's house as textless prehistory can provide. And the sequence of public buildings at Çayönü Tepeşi may well document the step-by-step evolution of the men's house, with its benches and curated ancestors' skulls, into a true Near Eastern temple with its corners aligned to the cardinal points (Özdoğan & Özdoğan 1989, Schirmer 1990).

Which rituals might have characterized such societies? At a minimum, they would include dancing, singing, chanting, and the wearing of costumes, the latter often representing ancestors or supernatural beings. Garfinkel (2003) has documented the evidence (mostly in prehistoric art) for dancing in the Neolithic Near East. Some clay figurines from Formative Mexico show individuals dancing, chanting, or singing (Marcus 1998b). At other New World sites of this era, archaeologists have found flutes, panpipes, ocarinas, whistles, and turtle-shell drums that were apparently played with antler drumsticks. Both Tlatilco in Mexico (García Moll et al. 1991, Piña Chan 1955) and Nahal Hemar in Israel (Bar-Yosef & Alon 1988) have masks of the kind that village societies often use in ritual. Prepottery Neolithic villagers at 'Ain Ghazal in Jordan used lime plaster to model faces on their ancestors' skulls, and they also made large plaster statues of what may be apical or mythological ancestors (Rollefson et al. 1992).

Ethnography tells us that societies featuring multigenerational descent lines sometimes traced those lines back to pairs of contrasting animals or supernaturals, like the Wolf and Raven of the Pacific Northwest. The Mexican equivalents were Earth and Sky, whose angry versions (Earthquake and Lightning) were symbolized on the Formative pottery of 1150–850 BC (Flannery & Marcus 2000, Marcus 1989). In addition to multiple descent lines, some prehistoric Old World villages may have had ethnically contrasting populations. Ma'adi, a very large Late Predynastic village in Egypt's Nile Delta, was occupied by (*a*) people who lived in circular, semisubterranean huts; (*b*) people who lived in rectangular houses built of logs and mud; and (*c*) people who lived in truly

subterranean houses, resembling those of Shiqmim in Israel's Negev region (Levy 1987). Corresponding differences in cranial characters have been claimed for the multiple cemeteries at Ma'adi.

DETECTING THE ORIGINS OF HEREDITARY INEQUALITY

A major evolutionary transition—one that has produced a large body of literature over the past two decades—is the replacement (in at least some parts of the world) of egalitarian, politically autonomous village societies where social status is based largely on achievement with societies with hereditary rank, expressed either as a "conical clan" of ranked individuals (Kirchhoff 1955) or as a caste-like hierarchy of chiefly and commoner clans (von Fürer-Haimendorf 1969). Although the differences between achievement-based and rank-based societies can be clearly described by ethnologists, distinguishing their prehistoric counterparts can be so stubborn a problem that some archaeologists have taken to lumping both under the generic term middle range societies (Berezkin 2004, Earle 1997, Price & Feinman 1995, Rousseau 2006).

A few examples should make clear why archaeologists need more refined methods for studying this crucial transition. Archaeologists looking for signs of hereditary rank often focus on what they call "prestige goods," especially sumptuary ornaments of raw materials exotic to the region. Unfortunately, egalitarian societies often accumulate similar exotica for bridewealth or status competition. In response to this problem, some archaeologists concentrate on sumptuary goods buried with infants or children, who, clearly too young to have achieved the right to possess such things, must have inherited their rank.

Many archaeologists believe that they can identify a "chief's house" at their site; yet the fact is that chiefly families, lineages, or clans are often distributed through many houses, sometimes even through different villages. Other archaeologists have tried to associate the manpower necessary to move huge stone monuments with chiefly authority; yet we know that there were egalitarian societies that could regularly assemble 50–100 men to move multiton stones (Hutton 1921). Despite these problems, and others, archaeologists have in fact succeeded in providing us with a number of recent comparative syntheses of rank societies (Drennan & Peterson 2006, Drennan & Uribe 1987, Redmond 1998, Stein & Rothman 1994).

A major focus of recent work on rank societies has been cycling, a long-term process during which chiefly societies arose, collapsed, and rose again. It is now clear, however, that evolutionary oscillations may have been common even at lower and higher levels of social complexity. At a lower level of complexity, for example, Walter and associates (2006) have documented a New Zealand agricultural society that for a time reverted back to hunting and gathering, eventually returning to agriculture. MacNeish (1958) found a similar reversion from agriculture to foraging in the Sierra de Tamaulipas, Mexico. At the level of rank society, archaeologists are, of course, familiar with the oscillations between egalitarian and rank society among the Kachin of Myanmar (Leach 1954). Anderson (1994) has documented analogous cycling between paramount and simple chiefdoms in the Savannah River area of the eastern United States. At a higher level of complexity, cyclic consolidation and dissolution occurred among states in the Maya region (Marcus 1992). More recently, similar cycling has been described for the Andean region and the Near East (Marcus 1998a, Postgate 1992).

RANK SOCIETY: A NEW WORLD CASE

In the Valley of Oaxaca, Mexico, Flannery and I assembled 10 lines of evidence to infer the emergence of rank, arguing that no single line would be sufficient (Marcus & Flannery 1996, p. 110). The evidence for rank society between 900 and 700 BC includes the deliberate cranial deformation of elite children; differential access to jade earspools and magnetite

mirrors; differential access to deer meat, pearl oyster, and *Spondylus* shell; a dichotomy between seated/kneeling (elite) burials and prone (lower-status) burials; figurines showing individuals in contrasting positions of authority and obeisance; four-legged stools like those carried by the attendants of chiefs in other New World rank societies; and other clues (Flannery & Marcus 2005).

Carneiro (1991) has made a useful distinction between rank societies where every village remained politically autonomous and societies where the chief's authority extended to smaller villages in the region, creating a territory in which village autonomy was lost. It is only the latter situation that warrants the term chiefdom—a widely misunderstood term because it refers to a territorial unit rather than to a type of society.

To detect this loss of political autonomy by subject villages, archaeologists often turn to settlement patterns, which may show the region's largest village to have been surrounded by smaller satellites. In the Oaxaca case mentioned above, Plog (1976) showed that the satellite villages subject to one large chiefly center tended to share more pottery design elements with the latter than would be predicted by a "gravity" model (one taking both distance and village size into account). For his part, Drennan (1976) showed that the most elite-looking burials at one satellite Oaxaca village were those of women, possibly hypogamous brides from the nearby chiefly center. Finally, large public buildings at that chiefly center contained exotic construction stones from villages up to 5 km distant, suggesting that satellite communities could be called on to supply labor and building material to the local chief.

RANK SOCIETY: AN OLD WORLD CASE

In the Chalcolithic period of the Near East, analogous data for rank can be found among villages of the period 5300–3700 BC. Identifying rank, however, is more difficult in the Near East than in Mesoamerica, in part because Near Eastern societies were less flamboyant (Flannery 1999a). This lack of flamboyance might reflect a greater reliance on sacred authority than on display. D'Altroy & Earle (1985) suggested that Chalcolithic Near Eastern societies relied more on "staple finance" than on "wealth finance." As a result, Near Eastern rank societies may have made less use of sumptuary goods than did their Mesoamerican counterparts.

That is not to say, of course, that one cannot find cases of Chalcolithic burials with sumptuary goods, including children too young to have achieved their apparent high status. At least three infants at the fortified Samarran village of Tell es-Sawwan on the Tigris were buried with alabaster statuettes bearing inlaid shell eyes and turquoise beads (El-Wailly & Abu al-Soof 1965). At the Halafian site of Yarim Tepe II in northern Iraq, several children 10–13 years of age were given special cremation burials, to which offerings such as alabaster vessels, painted ceramics, necklaces of ground and polished obsidian beads, rock crystal, marine shells, and a stone seal pendant were added (Merpert & Munchaev 1993). And one young woman buried in Chalcolithic levels at Choga Mish in Iran (Delougaz & Kantor 1996, Pl. 69) displayed an artificially deformed skull, not unlike those of some elite women from Formative Mexico. To be sure, no single line of evidence is sufficient to show rank; rather, the more lines, the better the case.

Chalcolithic clues to the loss of village autonomy, leading to the build-up of larger territories administered by chiefly families, can also be found. In the Sinjar-Mosul region of northern Iraq, it is not uncommon to find large (8 ha) Halafian villages surrounded by small (1–3 ha) villages that may be satellite communities (Hijara 1980). The richly painted pottery of the Halafian period, with its scores of motifs, also lends itself to studies of shared designs such as those undertaken by Plog in Mexico. LeBlanc (1971) subjected the painted motifs from seven Halafian sites in Syria, Turkey, and Iraq to a cluster analysis aimed at determining the extent to which villages shared motifs. The

strongest coefficients of similarity occurred between the largest Halafian sites—those most likely to have been chiefly centers—regardless of the distance involved. It would appear that, just as in Formative Mexico, important Halafian families exchanged gifts of elegant pottery with their counterparts in neighboring regions (Flannery et al. 2005). As Watson (1983) expresses it, the Halafian sites with the greatest evidence for high pottery craftsmanship were probably "chiefly centers, i.e., places of residence of local strongmen or chiefs."

DETECTING THE ORIGINS OF PRISTINE STATES

Archaeologists in both the New and Old Worlds have been hard at work on ways to detect pristine or first-generation states, those that were the first to arise in their region and did so without having an earlier state as a model. Wright & Johnson (1975) showed that during the Uruk period in southwestern Iran, the rise of the first state was marked by the appearance of a four-tiered site-size hierarchy, the upper three tiers of which had administrative functions. This pattern was discovered through (*a*) full-coverage settlement pattern survey, followed by (*b*) construction of a histogram of site sizes in hectares, and (*c*) the clear emergence of four modes of site sizes—in layman's terms, one city, several towns, a greater number of large villages, and still greater numbers of small villages. Administrative artifacts such as seal impressions in clay (created when jars or bales of commodities were sealed by officials) were found at sites of all sizes, although the seals themselves occurred mainly at the cities and towns where the administrators lived. Johnson (1972) also showed that some Early Dynastic cities in Iraq had regularly spaced "central place lattices" of lower-order sites around them.

Wright & Johnson's approach has proven useful in the New World. Billman (1999) and Wilson (1988) showed that four-tiered site hierarchies appeared in Peru's Moche and Santa Valleys, respectively, during the expansion of the Moche state. Marcus (1973, 1976) found that some Maya secondary centers of AD 700 formed very regular hexagonal central-place lattices around the capital cities to which they were subordinate. Settlement pattern data collected by Kowalewski and his collaborators (1989) can be used to show the presence of analogous central place lattices in the Valley of Oaxaca by the first century AD (Marcus & Flannery 1996, pp. 173–75).

Flannery (1999b) examined five historically documented cases of agents, each of whom created the first state in his region. In all five cases, the first state arose in the context of a group of rival chiefdoms, when one of those chiefdoms managed to gain a competitive advantage and reduce its rivals to subject provinces within a larger polity. Archaeological data suggest that this is what happened in the prehistoric Egyptian and Mexican cases discussed below. In a separate study, Flannery (1998) presented a series of archaeological clues to the presence of an early state, including palaces, royal tombs, and standardized temples for a state religion. These clues work better in some parts of the world (e.g., Mexico) than in others (e.g., the Aegean).

Finally, Spencer (1998) has adapted an equation from the literature on predation to develop a mathematical model showing that primary state formation necessarily involves territorial expansion.

STATE FORMATION: AN OLD WORLD CASE

During the Late Predynastic period (3700–3000 BC), the Nile Valley was occupied by a series of regionally distinct rank societies. Those downstream near the Nile Delta comprised Lower Egypt. Those upstream, at and beyond the great bend of the Nile, comprised Upper Egypt. The societies of Upper Egypt may have included as many as three chiefdoms, with their paramount centers at the sites of Naqada, Hierakonpolis, and This (Kemp 1989, p. 34). At the start of this period, Naqada seems to have been in its ascendancy, its cemeteries rich in sumptuary goods of gold, silver, ivory, and lapis lazuli. Suggestions of hereditary status come

from burials like that of Tomb 1863, a young girl accompanied by a Near Eastern cylinder seal (Petrie 1920, p. 40 and Pl. IX), ivory bangles, a slate cosmetic palette, a bone comb, a stone vase, and a pottery dish from the Sudan; she could hardly have achieved the right to such exotic burial offerings in her short life.

In a classic case of chiefly cycling, Hierakonpolis rose to eclipse Naqada between 3400 and 3200 BC. Hierakonpolis's regional population coalesced into fewer but larger settlements (Hoffman et al. 1987); the paramount center constructed a mudbrick defensive wall, an impressive temple complex, and several large tombs, one of which bears a mural showing an unnamed leader smiting an enemy with a mace. By 3200–3100 BC Hierakonpolis had unified all of Upper Egypt, creating a proto-state led by the rulers of what is currently called Dynasty Zero.

Having consolidated their power in Upper Egypt, the rulers of this macrochiefdom or proto-state moved downstream against the Delta, eventually unifying all of Egypt and ushering in Dynasty 1. By 3000 BC a famous carved slate palette from Hierakonpolis depicts a ruler with the hieroglyphic name of Narmer, wearing a double crown that combines the white crown of Upper Egypt and the red crown of the Delta. The unification of Egypt eventually required a new capital at Memphis because Hierakonpolis by then lay too far upstream to administer the whole Egyptian state. There followed a period of territorial expansion in which a vessel made from Egyptian clay and bearing the hieroglyph associated with Narmer reached southern Israel (van den Brink & Levy 2002).

STATE FORMATION: A NEW WORLD CASE

Spencer & Redmond (2004) have recently provided archaeological documentation for the step-by-step formation of the Zapotec state in the Valley of Oaxaca, Mexico. Their work, which complements the earlier research of Blanton (1978) and Kowalewski et al. (1989), brings the Zapotec case in line with examples of pristine state formation elsewhere in the world.

Between 600 and 500 BC, the Valley of Oaxaca (like Predynastic Upper Egypt) was divided into at least three chiefdoms, with their paramount centers at San José Mogote, Yegüih, and San Martín Tilcajete. Rivalry between paramount centers was intense, with San José Mogote enduring the burning of its major temple and carving a stone monument to depict the sacrifice (by heart removal) of a chiefly rival. At roughly 500 BC, at least 2000 people from San José Mogote and its satellite villages moved to a more defensible location, the summit of a 400-m-high mountain called Monte Albán, where they began building 3 km of defensive wall (Blanton 1978, Flannery & Marcus 2003).

Between 500 and 300 BC, nearly a third of the valley's population lived at Monte Albán. They had the support of the entire northern and central valley, the region from which their founders had come. Less than a day's journey to the south, however, lay Tilcajete, an unyielding rival. Tilcajete's response to the founding of Monte Albán was to double its own size (from 25 ha to 52.8 ha); its elite also laid out a civic-ceremonial plaza with an astronomical orientation deliberately chosen to contrast with Monte Albán's (Spencer & Redmond 2004).

At roughly 330 BC, Tilcajete was attacked by Monte Albán and its plaza was burned. Tilcajete refused to capitulate; instead, it drew in supporters and grew to 71.5 ha. Its leaders moved its civic-ceremonial center to a more defensible ridge, defiantly retained the same astronomical orientation, and erected defensive walls. In response, Monte Albán readied itself for a long campaign by concentrating thousands of farmers, artisans, and warriors in 155 satellite villages nearby. Not long after 300 BC, Monte Albán aimed its predatory campaign elsewhere, conquering a less-powerful polity to the north.

Eventually, at roughly 30–20 BC, Monte Albán attacked Tilcajete again, burning its ruler's palatial residence and a nearby temple. Tilcajete did not recover from this attack. It was abandoned, and on a mountaintop nearby, the victorious rulers of Monte Albán built an

administrative center subordinate to them (Elson 2007). What resulted from this and other military victories was a unified Zapotec state with a 2150-km^2 heartland, palaces, royal tombs, standardized state temples, and hieroglyphic references to distant places over which Monte Albán claimed hegemony.

The Egyptian and Zapotec examples are but two cases that show how archaeological, ethnohistoric, or historic data can be used to model state formation. Thus far I have seen no convincing case where a single, isolated chiefdom turned into a pristine state. All well-documented cases suggest that pristine states were created out of multiple chiefdoms and that, just as Spencer's mathematical model suggests, territorial expansion was involved. Once a pristine state existed in any region, however, second-generation (or even later) states could and did arise by alternative routes. One possible reason that there is some confusion about the pathways to the state is that a number of authors (e.g., Trigger 2003) have included late, non-pristine states (the Aztec, the Inka, the Akkadians, etc.) in their models. This reliance on later states obscures the process of pristine state formation by throwing the world's first states into the mix of alternative routes followed by second- and third-generation states, rather than keeping the pristine cases separate.

CONCLUSIONS

A great deal remains to be done by those who have sufficient curiosity about social evolution. To begin with, the empirical data of archaeology leave no doubt that such evolution occurred. There were no states 20,000 years ago; indeed, at that period even the evidence for segmentary society is fragmentary. In a world occupied exclusively by hunters and gatherers, signs of institutions such as opposable social segments, bridewealth, and the principle of social substitutability can be very subtle.

The origins of agriculture and animal domestication are considered topics so important that they will continue to be pursued, but the emphasis here is usually on subsistence and economics. The social changes accompanying early food production were profound, but in recent years they have taken a back seat to the application of new botanical, zoological, and DNA techniques to the study of the plants and animals themselves. In many parts of the world, agriculture created societies larger than any that had ever existed previously. Those societies could no longer be organized the way most foragers are organized. By creating the fiction that large numbers of villagers shared common descent, Neolithic societies focused increased attention on their ancestors, leading to unprecedented ways of treating the dead. They also created rituals both for separating and for recombining social segments; elaborating art, dance, song, and costuming; and necessitating widespread movement of exotic pigments, feathers, shells, and other "nonutilitarian" items. They built structures that were ritual rather than residential and, in many cases, provided potential leaders with ways to raise their prestige through acts of generosity, community service, or status competition.

So varied and remarkable were the feats of Neolithic or Formative societies that they present archaeologists with one of the greatest challenges: devising objective and convincing ways to distinguish achieved versus inherited status. Archaeologists are presented with countless cases of the differential treatment of individuals or families in the prehistoric record. Unfortunately, the reasons for such differential treatment are rarely self-evident. I have the impression that some archaeologists have missed the more subtle signs of hereditary rank, whereas others have underestimated the ability of egalitarian societies to erect public buildings, move multiton stones, produce art, and organize communal labor. This is a line of inquiry in which archaeologists would do well to collaborate with sympathetic ethnologists.

Hierarchical societies appeared relatively late, given the whole sweep of human life on earth. An interesting aspect of the first rank societies, however, is that they seem to have appeared precociously in certain regions, not in terms of absolute radiocarbon dates, but in

terms of their timing within the local cultural sequence. Consider, for example, the early village of Caral in Peru's Supe Valley (Shady Solís 2003). At 2200 BC (uncalibrated), a time when agriculture was still at a relatively simple stage, the occupants of Caral were quarrying multiton stones from nearby outcrops and building linear complexes with sunken courts for possible ceremonial processions and associated rites. A great deal of their food seems to have been fish, brought from the Pacific some 23 km away. On the Pacific coast lies an equally impressive early village named Áspero (Moseley & Willey 1973), which harvested the same species of fish carried to Caral. To fish, of course, Áspero needed cotton for nets and gourds for floats, two crops that Caral, 23 km inland, was probably growing with irrigation.

Although it will be years before we know the extent to which Áspero's and Caral's manpower was actually directed by people of hereditary rank, early Supe society looks precocious when compared with its contemporaries in the highlands of Mexico. By 2000 BC, Mexico's indigenous people were cultivating numerous food plants, including maize, beans, squash, chile peppers, and avocados, but they maintained a seminomadic settlement pattern, which makes it difficult to demonstrate the existence of year-round villages or segmentary societies. Andean archaeologists are justifiably proud of Caral and Áspero. They should not forget, however, that by the time both those sites were occupied, Egypt and Mesopotamia had had states for 1000 years.

The origin of the state, like the origin of agriculture, is a topic with such allure for archaeologists that it will be pursued with dedication for decades to come. Proving the existence of a pristine state requires a combination of settlement pattern surveys, broad horizontal excavations, artifact distribution studies, and exposures of the ground plans of buildings associated with state institutions. Just as there are difficulties in distinguishing achieved from hereditary status, so also are there difficulties in separating the achievements of paramount (or "maximal") chiefdoms from those of the first states. One line of evidence will never be enough.

Many of the best-known ancient states, of course, are those for which we have epigraphic, historic, or ethnohistoric data. Unfortunately, almost none of these states evolved from prestate societies. The Aztec and Inka were fourth- or fifth-generation states, building on templates established by earlier states such as Teotihuacan, the Toltec, the Wari, Tiwanaku, and Chimú. Middle Kingdom Egypt, Early Dynastic Sumer, the Akkadians, and the Old Babylonians all had earlier prototypes. We should study their trajectories but not confuse them with first-generation states. The latter seem to have been created by agents who thought that they were just expanding their chiefdom against its rivals, not creating a new social type.

In the analysis and documentation of social evolution, archaeology has the crucial role of providing the fossil record. It badly needs the collaboration of ethnologists and will patiently have to wait until a greater number of them redevelop an interest in comparison, contrast, and generalization. Perhaps the most compelling reason to return to the study of social evolution is because the archaeological record leaves no doubt that it actually happened.

For additional references, I refer the reader to Carneiro (2003), Graber (1995), Johnson & Earle (2000), Pluciennik (2005), Redmond (1994), Rousseau (2006), Sanderson (2001, 2007), Sawyer (2005), Spencer & Redmond (2004), Turner (2003), and Vannelli (2001, 2005).

DISCLOSURE STATEMENT

The author is not aware of any biases that might be perceived as affecting the objectivity of this review.

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