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Introduction

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FEW TOPICS ARE AT ONCE SO FASCINATING YET POTENTIALLY worrisome as the collapse of human societies. The ruins of great monuments that symbolize once-powerful states and other complex polities have long inspired awe and romanticized notions about the people who built them. The power of these sites' attraction today is testified by the many thousands who make long and expensive journeys to view such wonders as the pyramids of Egypt or the ancient Maya, the various ruins of ancient Rome, the terra-cotta army of Qin Shihuang's tomb in China, Angkor Wat in Cambodia, and many other sites that have become tourist destinations and fodder for the popular imagination. Yet these stunning monuments confront us with a dark message as well: even the most advanced (for their time, at least) and confident societies are vulnerable to total disintegration, and this message has unsettling implications for the future of today's increasingly global society. Even the collapse of a relatively peripheral state (e.g., Afghanistan) can have reverberating effects in other parts of the world.

Regardless of its unsettling implications, the collapse or transformation of complex systems is indeed part and parcel with the evolution of human societies and has been a persistent and recurrent theme of the human experience. It is thus a most worthy subject for investigation by archaeologists and historians. Yet archaeological interest in collapse has run hot and cold over the years, subject, in part, to the prevailing theoretical perspectives used to explain social evolution and change. In the study of sociopolitical evolution, interest in collapse has taken a back seat to interest in the rise of complexity and the emergence of new organizational forms. Before the 1980s, the anthropological study of collapse was primarily the domain of Marxist scholars (e.g., Friedman 1975, 1982; Friedman and Rowlands 1978), who generally acted as the spoilers in opposition to the systems and managerial theorists who held sway at that time.

Soon afterward, Renfrew (1984, first published in 1979) sought to bring collapse into the realm of systems

theory and was among the first archaeologists in recent decades to offer a general, theoretical model of collapse. We return to aspects of Renfrew's model later in this discussion.

Largely by happenstance, 1988 proved to be a banner year in the study of sociopolitical collapse, as two major works on the subject were published (Tainter 1988; Yoffee and Cowgill 1988). Like Renfrew before him, Tainter offered an encompassing theory of collapse, although his thesis—spelled out in a book rather than a chapter—was more penetrating and thoroughly constructed than Renfrew's chapter-length essay. Yoffee and Cowgill's effort was an edited volume that encompassed a diversity of views and ideas on the nature and causes of collapse. The effect of these two 1988 publications on the study of collapse is, to an extent, readily apparent in the pages of this volume, although some authors take explicit issue with ideas expressed in these earlier works.

Since 1988, interest in sociopolitical collapse has continued, but research results have been relegated mostly to specific case studies such as the ancient Maya (Demarest et al. 2004; Gill 2000; Webster 2002), the Bronze Age Aegean (Drews 1993), the Anasazi of the American Southwest (e.g., Stuart 2000), or the Mississippian chiefdoms of the southeastern United States (e.g., Anderson 1990; Pauketat 1992, 1994). During the 1990s, the expanding interest in "chiefdoms" (whether or not this term was used) was often accompanied by an awareness of the inherent instability of complex, prestate societies. In his edited volume on chiefdoms, Timothy Earle (1991a, 1991b) focused attention not only on how chiefdoms form, but also on characteristics of their organizational structures that made them inherently vulnerable to collapse.

Jared Diamond (2005) recently published a book that presents a serious effort to research and explain the causes of collapse and arrive at a general theory. Although he focuses to a large extent on the effects of environmental degradation, Diamond touches on many of the factors explored in this volume.

These on-going efforts enrich our understanding of collapse and identify powerful phenomena (such as natural disasters, disease, overextension, corruption, clashes of radically different cultures, environmental change and degradation, or warfare) that act as triggers of collapse events. More important, these studies reveal that collapse is a complex phenomenon whose root causes lie in social, political, and economic processes, as well as context-specific, historical and environmental circumstances. To orient the reader, this chapter explores some of the dimensions and causes of collapse and transformation, and it draws heavily upon—and benefits greatly from—previous efforts to characterize and explain these phenomena.

COLLAPSE AND COMPLEXITY

The very notion of collapse presupposes the existence of some level of complexity. Defining complexity is a task that could easily consume an entire volume in itself. For this discussion, we define *complexity* as an expansion of sociopolitical organization, which may involve scalar increases in population, formalized leadership, polity growth, territorial expansion, numbers and interconnections of decision-making units, and/or some development of specialized roles (e.g., shaman-priests, traders, warriors, engineers). Many of these attributes can be found at various levels of sociopolitical complexity, and although the study of collapse has traditionally focused on *states*, it is equally relevant to many prestate systems, including chiefdoms and even transegalitarian societies that might not have extended beyond the territory of a single village.

Accordingly, the study of collapse has focused on the loss—usually rapid and catastrophic—of material indicators of complexity. This, in turn, necessitates that we come to some agreement of what we mean when we use the term. Renfrew (1984:367–369) emphasized the sudden, catastrophic nature of collapse and listed four general features of system collapse, which are summarized here in Table 1. Note that Renfrew's features refer to the collapse of early *states*, although collapse can also occur in *prestate* complex societies (which, in fact, involves most of the case studies presented in this book). In his essay, Renfrew acknowledges that collapse may occur in prestate societies, with a specific reference to "the sudden decline of the Anasazi town sites in the southwestern United States in the thirteenth century AD" (1984:372). Moreover, not all of Renfrew's features will be found in the collapse of early states; for example, not all early states were literate, many did not have coinage, and not all cases of collapse

necessarily involve population reduction. Nevertheless, Renfrew's list of features prompts a vivid picture of what is involved in the process of collapse, and many of these features will be found in cases of collapse among both state and prestate societies. Of particular interest are the specific combinations of features that occur in a given case of collapse, and the underlying factors that led to the disintegration of particular polities or systems.

Yoffee (1988) does not specifically define the term, but he does offer the important observation that the same processes and conditions used to explain the emergence and maintenance of complexity could also create conditions leading to collapse. Accordingly, the study of collapse requires a reorientation of how we think about the ingredients of complexity.

The concern with rise, to the near exclusion of collapse, in evolutionary studies, has had important theoretical implications: social change has been perceived as a process of mutually supportive interactions that produce an irreversible succession of "emergent" levels of holistic sociocultural integration. . . . Collapse, on the other hand, requires that "levels" be broken down into institutional groupings of partly overlapping and partly opposing fields of action that lend the possibility of instability, as well as stability, to overarching societal institutions (Yoffee 1988:1–2).

Unlike Yoffee, Tainter is much more direct in offering a definition.

The process of collapse . . . is a matter of rapid, substantial decline in an established level of complexity. A society that has collapsed is suddenly smaller, less differentiated and heterogenous, and characterized by fewer specialized parts; it displays less control over the behavior of its members. It is able at the same time to command smaller surpluses, to offer fewer benefits and inducements to membership; and it is less capable of providing subsistence and defensive security for a regional population (Tainter 1988:38).

Both Yoffee and Tainter stress that, for collapse to occur, a condition of complexity must have previously emerged. Collapse, then, involves two essential dimensions: (1) rapidity and (2) fragmentation, and/or reduction in scale,

Table 1. Renfrew's (1984:367–369) General Features of System Collapse

General Feature	Specific Features
Collapse of central administrative organization	<ul style="list-style-type: none"> a. Disappearance or reduction in numbers of levels of central-place hierarchy b. Complete fragmentation or disappearance of military organization into (at most) small, independent units c. Abandonment of palaces and central storage facilities. d. Eclipse of temples as major religious centers (often surviving, modified, as local shrines) e. Effective loss of literacy for secular and religious purposes f. Abandonment of public building works
Disappearance of the traditional elite class	<ul style="list-style-type: none"> a. Cessation of rich, traditional burials (although different forms of rich burial frequently reemerge after a couple of centuries) b. Abandonment of rich residences, or reuse in impoverished style by “squatters” c. Cessation in the use of costly assemblages of luxury goods, although individual items may survive
Collapse of centralized economy	<ul style="list-style-type: none"> a. Cessation of large-scale redistribution or market exchange b. Coinage (where applicable) no longer issued or exchanged commercially, although individual pieces survive as valuables c. External trade very markedly reduced, and traditional trade routes disappear d. Volume of internal exchange markedly reduced e. Cessation of craft-specialist manufacture f. Cessation of specialized or organized agricultural production, with farming instead on a local, “homestead” basis with diversified crop spectrum and mixed farming
Settlement shift and population decline	<ul style="list-style-type: none"> a. Abandonment of many settlements b. Shift to dispersed pattern of smaller settlements c. Frequent subsequent choice of defensible locations—the “flight to the hills” d. Marked reduction in population density

of a complex sociopolitical entity. Population decline has also been cited as another dimension of collapse (e.g., Tainter 1999:1020), although evidence for population continuity or even increases has been observed in some post-collapse situations (e.g., Blanton 1983:186; Graffam 1992:887; both cited in Tainter 1999:1020). Contrary to assumptions held by some, however, collapse does *not* necessarily imply regional abandonment, or replacement of local populations by outsiders, although any of these phenomena may occur in the process of collapse and transformation.

COLLAPSE OF A POLITY (OR SOCIETY) AND COLLAPSE OF A CIVILIZATION (OR CULTURE)

As the title of Yoffee and Cowgill's (1988) book implies, collapse involves both states and civilizations. Tainter, however, sees the collapse of *civilizations* as a misnomer.

Collapse is fundamentally a matter of the socio-political sphere. It may and frequently does have consequences in such areas as art, architecture, and literature but, contrary to widespread belief, these are not its essence. It is incorrect to speak of a civilization collapsing, though this is commonly done. A civilization (that is, a great tradition of art, architecture, and literature) is the cultural system of a complex society (Tainter 1988:41).

What is called civilization is an epiphenomenon or product of complexity. . . . Civilization emerges with socio-political complexity, exists because of it, and disappears when complexity disappears. Civilizations do not collapse; specific political structures do (Tainter 1999:989–990).

It is certainly the case, however, that the collapse of a complex polity does not necessarily bring down its associated civilization. Such has been the case throughout China's history. Distinctive elements of Chinese civilization—including its written script, bureaucratic staffing based on the examination system, architectural styles, and various art forms—survived repeated collapses, fragmentation, and reorganization of political structures. Even outside invaders—namely the Mongols of the thirteenth century and the Manchus of the seventeenth, adopted most or all of the trappings of Chinese civilization and culture once their conquests were secured.

CAUSES OF COLLAPSE

The causes of collapse can be broadly split into two main divisions, internal and external. Internal factors relate to the structure and workings of a sociopolitical system itself, and discussions of internal causes of collapse most typically refer to economic overextension in one form or another. In this chapter we highlight corruption as another important factor in the weakening and collapse of societies and present a somewhat extended discussion of this topic as it is not commonly cited in explanations of collapse.

External causes, on the other hand, involve a variety of factors that are not the result of a social system's internal structure or dynamics but rather are attributable to "natural" or "foreign" cultural forces or events. These include natural disasters. Disease is another contributor to sociopolitical collapse, and the origin of devastating epidemics often has both natural and cultural causes. The disastrous effects on Native American populations of diseases introduced by Old World invaders and immigrants is the most obvious example. Invasions or pressure from outside groups may also lead to the collapse of a complex system and/or civilization. It can, however, often prove difficult to successfully disentangle external from internal causes, as internal weaknesses in a system may make it especially vulnerable to external pressures.

The internal-external dichotomy is not so clean when one considers such factors as environmental degradation. True, the behaviors that lead to environmental destruction emanate from within human societies themselves, but the effects—and whether or not they lead or contribute to the collapse of a complex system—often depend on context-specific characteristics of the natural environment. Accordingly, environmental degradation here is considered under its own category of explanations because the causal factors lie astride the division between internal and external factors.

Internal Factors

Economic Overextension and Diminishing Returns

The notion of economic overextension and diminishing returns has been a recurrent theme in explanations of collapse. Renfrew (1984) pursued this line in his essay on collapse, couching it in a feedback-loop model popular among systems theorists of the time, and emphasizing the bioevolutionary analogy of overspecialization. It was Tainter (1988), however, who used this argument to its fullest potential, and in doing so offered perhaps the most ambitious and penetrating explanation of sociopolitical collapse. In *The Collapse of Complex Societies*, Tainter advocated that collapse is the result of diminishing returns brought on by investments that eventually result in economic overextension. Essentially, Tainter argues that initial investments in complexity are cheap and easy to sustain. To maintain itself over the long run, however, a complex society must continually invest in complexity, and such investments become increasingly costly over time, and a society eventually encounters diminishing returns. As a result, the system experiences mounting stresses that fray the edges of the sociopolitical fabric, and eventually the entire polity disintegrates. External factors (such as environmental catastrophes or stresses, or invasions by barbarians) may act as catalysts in the final demise of a society, but the ultimate causes of the collapse are traceable to diminishing returns.

Tainter's is the quintessential argument that the root causes leading to collapse are essentially *internal* (note that this is also implied by Yoffee [1988:1–2]). In a somewhat different vein, Adams makes the same argument.

An essential—perhaps almost a diagnostic—feature of large-scale, complex but pre-industrial societies . . . was that short-term and long-term success were antithetical. Political stabilization and economic maximization were achieved only with a progressive weakening of the capacity to adapt to unforeseen challenges and changes (1978:333).

Millon (1988) makes essentially the same argument (and cites the above passage from Adams) in exploring the collapse of Teotihuacan. So does Earle, in his volume on chiefdoms (1991a); specifically, he draws a dichotomy (somewhat oversimplified, to be sure) between wealth-financed and staple-financed systems, arguing that the former are less stable than the latter. This was, Earle argues, largely because wealth-financed systems are dependent to a large extent on the acquisition of foreign prestige items.

In making his case, Earle's explanation echoes Tainter's.

The growth in a wealth financed system can rarely be sustained because of problems of inflation, depletion, and overextension. For whatever particular reason, wealth financed systems are inherently unstable, and periodic collapses occur commonly (Earle 1991b:97).

Like Tainter, then, Earle argues that inflationary spirals among chiefdom-level societies often led to collapse, with the collapse itself often followed by reorganization and reemergence of complexity. According to Earle, among chiefdoms this often results in cycles of growth and collapse. Note the similarities to the gumsa-gumlao cycles described by Friedman (1975; see also Friedman and Rowlands 1978), and the process of chiefly cycling among southern Atlantic Coast Mississippian groups described by Anderson (1990).

Under the prevailing notion that it is internal factors that bring about collapse, external factors—such as environmental disasters or barbarian invasions—cannot by themselves bring about the wholesale collapse of a complex society. As the argument goes, such forces may finally break a sociopolitical system and usher it to its ultimate demise, but only if that society is already strained to the limit by the side effects of diminishing returns or other internal pressures. We revisit this basic premise of Tainter's diminishing-returns theory of collapse below.

Corruption and Repression: Lessons from the Modern World

Another internal source of pressure that can threaten a polity's viability—and render it vulnerable to collapse—stems from behavioral flaws within the political system itself, specifically corruption and abuse by the ruling class. The modern world indeed offers repeated examples of polities that fail largely as a result of abuse or incompetence on the part of rulers. Archaeologists are understandably hesitant to pursue such lines of explanation, in part because the historical detail necessary to demonstrate such specific behavioral patterns are lacking in the archaeological record, especially when it comes to nonliterate societies. Getting at the past through the modern world is also fraught with potential hazards, as it could be argued that present-day geopolitical conditions are so radically different from those of the ancient past (or even among more recent, but premodern, complex societies) that any lessons to be gained would be illusory. Moreover, in today's oversensitized political climate many

archaeologists probably eschew dealing with the modern world simply to avoid unintended distractions or debates.

Whether or not one accepts humanity's current state as a window on the past might depend in part on one's sentiments vis-a-vis the old, formalist-substantivist debate (LeClair and Schneider 1968). Assuming a substantivist position, one could argue that such comparisons are indeed useful. Looking at premodern complex systems, we can see that some of the services provided by sociopolitical leaders may indeed be analogous to those found in more modern systems. Take the garden magician of the Trobriand Islanders, for example (Austen 1936; Malinowski 1922). Although this individual's ostensible role was to perform magic aimed at ensuring a bountiful yam harvest, in doing so he also had an opportunity to keep tabs on productivity levels and thus anticipate the amount of chiefly tribute to be expected. Such a role is obviously similar to that of tax assessors in more-complex state systems.

Similar analogies could easily be piled up. But in terms of the study of collapse, the important point is that, when the balance between services provided and payment extracted is tipped too far in the direction of the latter, or expected services can no longer be provided (for whatever reason), a sociopolitical system becomes acutely prone to failure and disintegration. One of the easiest ways for this imbalance to arise is through greed, corruption, and incompetence on the part of rulers.

For the moment, then, let us assume that the process of collapse may have some similar threads that run through both modern and premodern sociopolitical systems, and that corruption and incompetence present a road to collapse that has been trodden for millennia. Accordingly, consider a recent essay by Rotberg (2002), who identified several important signposts of collapse observed among present-day failed states. Rotberg highlights *corruption* as one of the instigators of a nation's descent into the sociopolitical abyss. As the old saying goes, absolute power corrupts absolutely, and the dangers of corruption and cronyism are always lurking in the machinery of a hierarchical, highly centralized complex system. Patronizing particular ethnic groups, clans, classes, or kin is a common expression of corrupt systems, and these behaviors are clearly evident in historically recent and current cases, such as the hyper-abusive rule of Saddam Hussein in Iraq, Robert Mugabe's Botswana, and the collapse of Somalia (Rotberg 2002:129). History is replete with similar examples, and it does not seem an unwarranted leap to assume that the temptation toward favoritism was an ever-present threat to the viability of complex human societies, even comparatively small-scale ones.

As Rotberg explains, once a ruling elite ceases to operate for the benefit of the entire system and becomes entrenched in a pattern of corruption, the descent toward sociopolitical failure and collapse tends to snowball. As elite organizations provide fewer and fewer services,

people feel preyed upon by the regime and its agents. . . . Security, the most important political good, vanishes. Citizens, especially those who have known more prosperous and democratic times, increasingly feel that they exist solely to satisfy the power lust and . . . greed of those in power (Rotberg 2002:129).

Although the above passage was written to characterize failure in modern, underdeveloped states, a similar process could have occurred in any ancient society where an elite organization existed. In the modern world, failed states may become vulnerable to total collapse and fragmentation or, with welfare-like handouts from wealthier nations or global organizations, may limp along for an extended period of time in their severely weakened condition. In recent years, terrorist organizations have been able to gain considerable footholds in weakened states, Afghanistan being the obvious example. In the most extreme cases—rare in the modern world—states may descend into total collapse, which according to Rotberg (2002:133–134) is

typified by an absence of authority. Indeed, a collapsed state is a shell of a polity. Somalia is the model of a collapsed state: a geographical expression only, with borders but with no effective way to exert authority within those borders. Substate actors have taken over. The central government has been divided up, replaced by a functioning, unrecognized state called Somaliland in the north and a less well defined, putative state called Punt in the northeast. In the rump of the old Somalia, a transitional national government has emerged thanks to outside support. But it has so far been unable to project its power even locally against the several warlords who control sections of Mogadishu and large swaths of the countryside. Private entrepreneurialism has displaced the central provision of political goods. Yet life somehow continues, even under conditions of unhealthy, dangerous chaos.

Such state “shells” exist in today’s world in large part because of the modern-day sanctity ascribed to the

territorial “integrity” of present-day national boundaries. In prestate and ancient worlds, there was little regard for such geopolitical protocol, nor were there any global organizations to prop up failed polities. Weakened ancient polities (many fragile to begin with, especially in the case of prestate entities with elite organizations, such as chiefdoms) were much more vulnerable to total collapse and fragmentation, and predation by rival polities in the geopolitical neighborhood. The ancient equivalent of substate actors may have included local leaders or lineage heads, or even regional leaders installed by the formerly more-powerful, central polity. Such individuals may move outside the collapsed sociopolitical system and begin to supply political goods—including security, management of economic activity, and orchestration of ceremonies—that were once provided by the now-weakened, larger polity. As paramount elites sense the increasing desperation of their positions of authority, they may respond with intensified repression. Such tactics may or may not prolong their hold on power, but the long-term effect is typically to further weaken any support elites might still enjoy among their subjects, helping to seal their ultimate fate—and that of their polity.

External Factors

Arguments and models advocating internal causes offer compelling explanations of collapse. Processes such as inflationary spirals and diminishing returns certainly appear to be relevant to many cases of sociopolitical disintegration—and these processes are easily intertwined with unhealthy tendencies toward greed, corruption, favoritism, and ineptitude. But not everyone agrees that all cases of collapse can be explained by internal factors and conditions. Causes that are external to the functioning of the sociopolitical system itself have long been advanced by many scholars to explain the demise of this or that polity or system. These include attacks from barbarians and other intruders, climate change, episodic natural disasters, and resource depletion (although the latter relates to both the potential of the natural environment and the behavioral patterns inherent in the specific culture or sociopolitical system).

In advocating his diminishing-returns theory, Tainter (1988:39–90) dismisses each of these factors as insufficient, by themselves, to cause the collapse of a complex society. Yet one is still left wondering if a sudden invasion by barbarians or a catastrophic natural disaster might not actually trigger the downfall of a polity or regional system, even an otherwise “healthy” one.

Moreover, how does one really distinguish a "healthy" system from one that is already beginning to succumb to the strains of diminishing returns? Do not all complex sociopolitical systems face challenges that must be constantly managed, and might not an unfortunate invasion or natural disaster shake up even the most carefully orchestrated balance between elite power or privileges and services to commoners, and between resource availability and extraction?

Bronson points out the temptation of tautological reasoning when seeking out internal causes of sociopolitical collapse.

As I too am a believer in social phenomena caused by positive feedback, I do not doubt that states have often fallen for internal reasons. Yet I am uncomfortable with the partial circularity of the logic behind such explanations. How do we know that the symptoms we observe are those of decline? Because the state in question eventually falls. And how do we know that these symptoms of decline are causative agents? Either because we think we see them getting worse as the end approaches or because we have defined them that way. . . . The internal causes we are prone to cite bear a resemblance to self-justifying prophecies even if, unlike Jeremiah and his many successors, we do not always ascribe the fall of states entirely to sin (1988:197–198).

Barbarians

Bronson examines one of the exogenous factors that has been attributed to the fall of states and civilizations since scholarly interest in the subject began: the role of barbarians. Defining a barbarian as "simply a member of a political unit that is in direct contact with a state but that is not itself a state" (1988:200), Bronson underscored barbarians' attraction to the material wealth of nearby states as a recurrent source of pressure on states, both ancient and modern.¹ He noted certain key advantages that barbarian groups may enjoy at the expense of their state-organized enemies, or at least organizational features that make it difficult for states to effectively conquer them. Some reside in mountainous terrain within which it is difficult for state-organized militaries to operate successfully. It is much cheaper for barbarians to mobilize militarily than it is for states, and the risks of going to war are considerably lower for the non-state hordes. Some barbarians are especially skilled and effective warriors (although many

are not). Acephalous societies are especially difficult to conquer, as "there is no one who can offer an authoritative surrender" (Bronson 1988:205).

Bronson goes on to argue that the potential success of barbarian groups may relate to geography: specifically, the proximity to states (or productive areas where states could have developed) of expansive, mountainous homelands that have hosted large barbarian populations. He points to three examples in making his case. The first is India, where states and a high civilization have existed since ancient times, but where individual state polities historically were short-lived and susceptible to repeated predation from barbarians residing in the vast mountains of present-day western Pakistan and Afghanistan.

The second and third examples Bronson cites are in Southeast Asia—the Deli Plain around Medan in northern Sumatra, and the Central Plain around Manila in Luzon. Soils are exceptionally fertile in these areas, and they are both located along major trade routes and have good harbors—conditions that could have easily supported at least small-scale state polities. Yet only one such polity may have emerged in the Deli Plain (Kota Cina, in the thirteenth to fourteenth centuries), and there is no evidence of an indigenous, pre-Spanish state polity in the Manila area. The reason, according to Bronson, is that both areas are severely circumscribed, being surrounded by extensive mountainous terrain inhabited by large barbarian populations. In these cases, the mere presence of barbarians was enough to preclude successful state development.

Even in cases where a state is ultimately brought down by barbarian enemies, our scholarly tendency to focus on large-scale processes at the expense of more stochastic factors, along with moralistic notions that are part of our intellectual and cultural heritage, prompt us to cite internal decay of a state as responsible for its downfall. This is evident even in today's world, where terrorist attacks have led to widespread questioning of—or even laying the blame squarely on—the moral health or policies of the state-level societies targeted by terrorists. The fact that the values of the targeted state are often much closer to those of their critics—whereas modern terrorists tend to espouse premodern values that are antithetical to those same critics' sentiments—underscores how deeply rooted this notion is among large segments of the educated public in modern, state-level societies. Yet in recounting the potential advantages that some barbarian groups enjoy under certain sets of circumstances, Bronson at least entertains the possibility that predation by such groups could have brought down even "healthy" states.

Natural Disasters

Another possible external source of collapse is natural disasters. Devastating droughts, floods, volcanic eruptions, massive landslides, and earthquakes (and their potential side effects, including mudslides and tsunamis) have all been credited with wiping out individual settlements and have been implicated in the downfall of entire states or polities.

It is important to understand that not all extreme natural events produce social cataclysm. The specific characteristics of extreme natural events, such as their temporal duration, frequency of repetition, speed of onset (time between initial effects and peak effects), and spatial dispersion (distributional pattern of damage effects), interact with the socioecological characteristics of specific societies to produce cataclysms. Important social variables in this mix include resource distribution (concentrated and intensive or dispersed and extensive), capital investment facilities (irrigation technology, dams or river channels, etc.), level of technological development, population density and distribution, wealth, and level of sociopolitical complexity (Hoffman and Oliver-Smith 1999; Reycraft and Bawden 2000).

The impact severity of a disaster may be the result of a long history of ecological, political, and economic choices by a society. These choices result in specific patterns of political ecology—that is, how a society and its political system modifies and manages the local natural environment—that may either exacerbate or mitigate the destructive effects of natural disaster. As a result of their political ecological histories, some polities may be more vulnerable to a specific type of natural disaster. For example, the Tiwanaku Empire was an indigenous state that flourished in the Andean altiplano (high plateau) for approximately 500 years, between AD 600 and 1100. During this period, the Tiwanaku state expanded from its altiplano base to occupy both the eastern and western slopes of the Andean sierra. Each slope of the Andean sierra contains multiple resource zones that produce a variety of elevation-dependent crops. Resource production in the eastern and western sierras is dependent on the Amazon and Pacific Coastal weather systems, respectively, which are independent of each other. Tiwanaku resource extraction was thus extremely diverse, and although particular areas could be impacted by natural disaster, the system in general was very low-risk, which likely resulted in the polity's long period of political stability. As the Tiwanaku developed, however, the altiplano core region became heavily dependent on a highly specialized technology—raised field agriculture fed by the waters of

Lake Titicaca. Increasingly successful yields from this technology fostered greater investments and population increases over time. When an extended drought hit the altiplano around 1040, the population-dense core region had become too dependent on this technology. Titicaca lake levels dropped dramatically, stranding the raised fields. The Tiwanaku Empire collapsed shortly thereafter, as large populations in the core shifted to more secure sierra locations (Kolata 2000).

The role of natural disasters in the collapse of complex systems also depends on the *scale* of both the disaster and the political system it affects. When the geographic extent of a cataclysm approaches or surpasses the territorial boundaries of a polity, severe hardship and sociopolitical collapse are likely as the society will be unable to draw resources from unaffected regions. For example, the mudslide that buried the (American) Northwest Coast village of Ozette in 1750 (see Ames and Maschner 1999:111) or the tsunamis that wiped out (or at least caused the abandonment of) coastal Maori villages in New Zealand in the mid-fifteenth century (Goff and McFadgen 2001) were far more disastrous to the single-village polities involved than the much more catastrophic (in terms of loss of human life) burial of Pompeii under volcanic ash was to the Roman Empire.

The devastating tsunami of December 2004 jolted a worldwide focus on the incredible degree and scope of destruction wrought by the massive waves that crashed into sleepy villages and seaside resorts around coastal South Asia. Those news images also alert us to the potential impact tsunamis may have had on past societies along the world's coastlines, especially in tectonically active areas prone to earthquakes and volcanic activity. As devastating as it was, the 2004 tsunami did not threaten the actual sociopolitical survival of the nations involved because each affected nation encompasses a large land mass, most of which was not directly affected by the destructive waves, and also because each of those nations is today integrated into a global network that includes massive outpourings and rapid mobilization of direct aid in the wake of such disasters. But coastal villages and seafaring or otherwise coastal-oriented polities hundreds or thousands of years ago could not depend on such outside support.

Perhaps the best-known scenario involving a tsunami-triggered collapse involves the ancient Minoans. Around 1630 BC, the small island of Thera, a mere 64 miles (103 km) north of the Minoan heartland of Crete, was blown apart by a massive volcanic eruption. Volcanic tephra and pyroclastic flows completely buried the Minoan mercantile center of Akrotiri and resulted in the complete

abandonment of the island. Regional effects included dispersed ash falls as far away as the Levant, the Anatolian peninsula, and the Nile delta (McCoy and Heiken 2000). Seismic activity was felt throughout the Aegean region. This event also sent giant tsunamis racing out across the Aegean Sea, particularly to the west and south. Tsunami-generated deposits in Minoan archaeological settings on Crete (Francaviglia and Di Sabatino 1990; Pichler and Schierling 1977; Vallianou 1996) indicate that massive waves directly affected Minoan centers on Crete.

Some researchers (e.g., Marinatos 1939; Chadwick 1976) have proposed that this event directly resulted in the collapse of Minoan civilization (both on Crete and in the entire Aegean region). Others dismiss the Thera eruption as a factor in the Minoan collapse. Tainter (1988:54) suspects that Minoans on nearby Crete "most likely stopped to watch the eruption . . . , made whatever preparations were called for, and when it was all over went about their business." This speculation seems little short of incredible considering the potential destruction such a disaster would have had on a seafaring culture. Indeed, it seems that Minoan culture, with its emphasis on maritime trade, its multiple seaports, and its administrative nodes situated so close to the sea, would have been particularly vulnerable to this type of cataclysm. Based on the wealth encountered at Akrotiri (Doumas 1983), Thera appears to have been a major economic partner in the Minoan maritime network. There can be no doubt that the eruption immediately dissolved this relationship. Tsunami waves would also have destroyed most of the Minoan port facilities and any fleets docked in the Aegean. Seismic activity would also have been very strong, likely resulting in partial collapse of many Minoan administrative centers (Marinatos 1939).

Amazingly, Minoan culture did not collapse immediately following this event. The Minoans patched up their palaces, repaired what was left of their fleets, and continued to exchange, albeit in a much diminished capacity, for a few more generations. So, can we blame the Thera eruption for the Minoan collapse? It certainly significantly disrupted their maritime network, destroyed fleets and facilities, and removed a major trade link. In short, it initiated a rapid decline that resulted in a later collapse. We should also bear in mind that, unlike the 2004 South Asian victims, the Minoans would have received no international aid in the wake of such a disaster, but would have had to pick up the pieces on their own.

Episodic climatic events have also been shown to play a hand in the collapse of complex societies. In Chapter 8, Reyecraft presents evidence that the disastrous effects

of an extreme El Niño event resulted in the collapse of a chiefdom-level polity of the Chiribaya in southern coastal Peru. The polity involved a symbiotic network which included procurement of marine resources along the coast and inland irrigation farming fed by a system of canals that ran along the steep sides of a valley. The El Niño event disrupted the availability of marine resources, and torrential rains resulted in landslides that breached the irrigation canals, wiping out the local agricultural capabilities. Although the local Chiribaya chiefdom may have been experiencing diminishing returns from its economic strategies, there is nothing in the archaeological evidence to suggest that it was already in trouble; in other words, this may be a case where the multi-pronged front of a natural disaster was sufficient to bring down an otherwise "healthy" complex system.

Not all extreme natural events are immediately cataclysmic. Longer-term changes in climate, especially reduced precipitation levels or changes in the seasonality of precipitation patterns, can have cumulative effects that are catastrophic for human societies. The late prehistoric societies of the American Southwest present the obvious case in point, where a prolonged drought and, perhaps more important, a change in precipitation seasonality had dire effects on the region's native peoples around AD 1300. The puebloan societies of the Four Corners region—renowned for the well-known ruins at such places as Chaco Canyon and Mesa Verde—thrived on a maize-based agricultural economy for several centuries before an extreme drought and altered precipitation patterns forced abandonment of this vast region, apparently in a matter of decades (Stuart 2000).

Disease

Epidemics could be considered together with other natural disasters, but the role of disease in the collapse of complex societies has historically involved both natural and cultural agency. The effects of Eurasian diseases that accompanied European explorers over the past several centuries, including population crashes among indigenous peoples ranging from Australia to the New World, are well known. In many cases, the inadvertent introduction of diseases to which native peoples had no natural immunity was an unintended component of a broader arsenal brought to bear on indigenous societies.

Consider the example of Inka Empire. In AD 1525 the Inka were at the apex of their political and military development. The Inka emperor, Huayna Capac, was in the process of completing the military conquest of the Ecuadorian region, thus expanding an empire that stretched

south from Quito to central Chile. By this point in time, all serious military contenders to Inka supremacy in South America had been vanquished. Although Europeans had visited Central America, they had not yet traveled to South America. In sum, the Inka appeared invincible: they had a continental-scale empire; they maintained a vast, well-disciplined army; they had no competitors; and they were a wealthy and strong people. Nevertheless, in 1532 a small band of Spaniards, led by Francisco Pizarro, managed to capture the Inka emperor, and by 1536 the empire itself was effectively under Spanish control. We must ask ourselves, as the Inka undoubtedly also did, how could such an event occur? How could a motley band of Spanish privateers have defeated the Inka with their army of tens of thousands? Could better technology (horse and harquebus) have made up for such a tremendous disadvantage? Were the Spanish, as they themselves believed, blessed by God? Were the Inka a backward, weak, morally and militarily undisciplined people? Of course the answer to all of these questions is no. While horse and harquebus did have advantages in close combat, there were simply too few Spaniards to overthrow such a vast empire by themselves.

But the Spanish did have a secret weapon (of which they were completely unaware): their diseases had spread through the Andes well in advance of their military expeditions. In 1525 a plague of widespread proportion, likely smallpox, decimated the Inka Empire. This plague claimed a spectacular victim, Huayna Capac, the Inka emperor himself (Conrad and Demarest 1984). His death was a surprise, succession to the throne had not been determined, and a ferocious and bitter civil war between his two sons, Huascar and Atahualpa, began. Huascar had the better claim to the throne, and he was based in Cusco, the Inka capital. However, Atahualpa was based in Quito. There he could count on the support of battle-hardened Inka and Canari troops from the Ecuadorian frontier. The war tore apart an empire already damaged by plague. Factional, administrative, and economic problems that were roiling just beneath the surface of Inka organizational control erupted openly during the civil war. Ultimately, Atahualpa defeated and killed Huascar, and as he moved south to Cuzco, he was captured by Pizarro and his men. This was an unintentional but very timely window for invasion on the Spaniards' part. No wonder they believed God was on their side.

The effects were even more direct in what is the present-day southeastern United States, where introduced diseases did most of the work in snuffing out the late prehistoric chiefdoms of the Mississippian culture. Here,

unlike the conquests of the Inka and Aztec, the entrada of the Spanish conquistadors in the mid-sixteenth century was little short of a disastrous failure. Although many Mississippian chiefdoms had already collapsed, and it is likely that introduced diseases were already starting to ravage Mississippian populations before the expedition of Hernando de Soto explored the region in 1540, there were nonetheless a host of Mississippian chiefdoms still surviving at this time, some quite populous and encompassing numerous towns and villages spread over large regions (see Hudson et al. 1985). Yet during the century and a half between the Soto expedition and the journey of Marquette and Joliet down the Mississippi River in the 1670s, the vast majority of these societies had collapsed, mortality rates had led to a dramatic regional population crash, and only a few chiefdom-level societies (such as the Natchez) remained. Most of the surviving remnants of the once-great Mississippian chiefdoms reorganized themselves into more segmentary societies, forming confederacies to counter the progressive incursion of European immigrants and their descendants from the East Coast into the interior of the Southeast.

Clash of Cultures

The ravages of Eurasian diseases on the New World and other geographically marginalized peoples in the preceding half millennium alert us to the more general role of cultural clashes in the processes of collapse and transformation. Culture clash leading to the collapse and destruction of indigenous complex societies may date as far back as Neolithic times, when populations of farmers spread from centers of domestication and replaced complex societies of indigenous hunter-gatherers in their wake.

The expansion of ancient empires toppled many indigenous chiefdoms and other complex systems. But the most dramatic examples in human history, and the ones involving a clash of cultures that had evolved in isolation from each other for millennia, stem from the exploration and colonization of far-flung lands by Europeans beginning with earnest in the sixteenth century. The technological capacity, communication systems, and military capabilities of the Europeans were far more sophisticated than those of even the most complex societies they encountered, such as the Aztec and Inka of the New World. The advantages thus conveyed on Europeans were such that the complex indigenous societies they encountered collapsed quickly, with their populations exterminated, greatly reduced, and otherwise marginalized or enslaved by the newly established European colonies and derivative states. Granted, there were some momentary setbacks for the

Europeans, notably the Pueblo Revolt against the Spanish colonists in New Mexico in 1680, the Plains Indians' victory over General Custer and his troops at the 1876 battle of the Little Bighorn in Montana, and the victory of Shaka's Zulu army over British forces in 1879 at the battle of Isandlwana in present-day South Africa. In Chapter 9, Petersen and his colleagues examine the potential role played by the clash of cultures in the collapse of Caribbean and Amazonian complex societies.

Warfare

Hostility and warfare have likely been part of the human condition since our ancestors became human. Warfare of course does not lead inevitably to the collapse of a society or even the conquest of one polity by another. But warfare has played a direct role in the downfall and subjugation of many societies, and the critical factor here relates to inequities in military technologies and capabilities. Again, the obvious case here is the hemisphere-wide collapse of the New World's native societies, whose military capabilities and technologies were no match for the iron weaponry, firearms, and cavalry warfare of their invading European enemies.

But warfare has been credited with a leading role in the collapse of ancient societies as well. Drews (1993) has argued that the collapse of Bronze Age polities in the eastern Mediterranean ca. 1200 BC was a result of changes in warfare tactics. Specifically, Drews contends that Late Bronze Age armies of the "civilized" states (i.e., New Kingdom Egypt, Mycenaen and Minoan Greece, the Hittites, and various polities in Syria and the Levant) focused on chariot warfare, with chariot-mounted archers delivering the main punch in battle, while infantry and cavalry served only a supporting role. According to Drews, this was the Late Bronze Age *modus operandi* for doing battle, both between "civilized" armies and against the surrounding barbarians who generally lacked chariots.

Beginning around 1200 BC, however, Drews argues that the barbarians figured out how to neutralize the great chariot forces, primarily by attacking in massive hordes that included fleet-footed "runners" who launched javelins to take out the chariot horse teams, and whose hit-and-run tactics enabled them to evade the chariot-mounted archers. In addition to the javelin-armed runners, in the Late Bronze Age barbarian groups in southern Europe developed new forms of slashing and cutting swords (particularly the Naue Type II sword), which were more effective and lethal than the thrusting swords employed by the armies of the eastern Mediterranean states. These changes in barbarian military tactics and capabilities were,

according to Drews, the decisive factor in weakening and, ultimately, bringing down the Late Bronze Age states of the eastern Mediterranean. Moreover, their successor states transformed their own militaries in response to this new reality by shifting the focus from chariot warfare to massed infantries equipped with the new sword types and javelins, with chariots now relegated to a supporting role on the battlefield.

In the New World, the arrival of the recurved bow in the American Southwest around AD 1300–1400 conferred on its adopters a decided advantage against any enemies still using the traditional self-bow. The arrival of this new type of bow—which delivered an arrow with considerably more force, velocity, and potential distance than the earlier and simpler self-bow—appears to correlate with evidence suggesting an escalation of warfare and defensive concerns during the Pueblo III and Pueblo IV periods (LeBlanc 1999). Although LeBlanc argues that it was primarily climatic factors (i.e., reduced precipitation) that contributed to levels of competition, violence, and warfare in the Southwest, he suggests that new military capabilities, enabled by introduction of the recurved bow, exacerbated these conditions after ca. 1300.

Environmental Degradation

Although the natural environment can be thought of as an external factor in the workings of a human sociopolitical system, resource utilization and overexploitation can easily result in environmental degradation, which in turn can have serious impacts on the functioning of human societies. This is patently obvious in today's world, where such effects are well-studied and constitute a central part of the highly charged political discourse.

Today, deforestation ranks among the world's greatest environmental concerns. But the deleterious effects of obliterating natural forest cover have plagued human societies in the past and in some cases appear to have been a major factor in the downfall of complex systems. Easter Island (Rapa Nui) presents a stark example (see Kirch 1984:268; Stevenson and Cristino 1986; Casanova 1998; Stevenson and Ayres 2000; Diamond 2005:79–119). When human settlement first reached this most remote of Pacific Islands ca. AD 800–900, Easter Island was covered in a rich forest, including a now-extinct species of giant palm (Dransfield et al. 1984; Flenley and King 1984). The wood resources were sufficient for constructing ocean-going canoes with harpooning platforms for hunting porpoises (the main meat source during the early centuries following settlement of the island), and for providing the timbers and rope necessary to haul and erect the great *ahu* platforms

and *moai* statues for which the island is so well known. In addition, Easter's forests provided fuelwood for cooking, heating, and cremation (the main mortuary practice throughout most of Easter's prehistory), fruits and nuts that supplemented a diet based primarily on domesticated species, and an abundance of now-extinct native bird species (Ayres 1985; Steadman et al. 1994).

By ca. 1600, Easter had been deforested, and the effects were apparently disastrous. The dwindling numbers of trees—and eventually their wholesale disappearance—led to degradation of the island's soils, severely impacting crop productivity. Timbers for erecting the great monuments were also no longer available. Large canoes could no longer be constructed, after which porpoise dropped out of the diet. Starvation ensued, and population levels began to drop. The complex, stratified sociopolitical order, which had united the island's population peak of perhaps 15,000 people under one huge polity, collapsed. The resulting crisis of faith led to toppling and destruction of the *moai*. Easter's society fragmented into warring factions and cannibalism became prevalent, accelerating the demographic crash. By the time the island was first encountered by Europeans in the eighteenth century, Easter was inhabited by perhaps only 2,000 people, living on a terrain stripped of trees and littered with toppled monuments constructed during the island's much more lavish past.

Sometimes the effects of environmental degradation, and whether or not it triggers a "natural" disaster, depend on the nature of the local or regional environment. The site of Ozette, on the Olympic Peninsula in present-day Washington state, marks the remains of a coastal village of the Makah people that was buried under a catastrophic mudslide around AD 1750 (see Ames and Maschner 1999:111). The mudslide was probably triggered by deforestation of the steep hillside behind the village. Because the Ozette site was probably a single-village polity typical of late prehistoric Northwest Coast societies, this "natural" catastrophe may well have caused the "collapse" of this particular society. Had the village not been situated so close to such a steep slope, denuding of the surrounding forest would not have had such disastrous effects.

POST-COLLAPSE OUTCOMES

To fully understand the collapse of complex systems, it is also essential to examine *post-collapse* societies and modes of reorganization. Following collapse, a complex polity may fragment into smaller units that resemble their larger precursor, or it "may decompose to some of the constituent building blocks (e.g., states, ethnic

groups, villages) out of which it was created" (Tainter 1988:38). In outlining general features of the aftermath of collapse, Renfrew (1984:368–369) suggests a return to something resembling earlier sociopolitical and economic conditions is common. Fragmentation of redundant, organizational building blocks is often assumed to be the case with chiefdoms, which typically involve multiple local centers that are essentially copies of the paramount center in terms of organizational structure and functions. Because they lack the complex, specialized bureaucratic organs that make up state-level organizations, chiefdoms often accomplish polity growth by "stacking" kin-based organizations into larger structures, such as the conical clans described by Sahlins (1958) and Friedman (1975). Because of this essential redundancy among its loosely coalesced pieces, chiefdoms are seen as especially susceptible to fragmentation into their component parts. The apparently recurring, cross-cultural phenomenon of chiefdom cycling is one outcome of this kind of organizational structure (Anderson 1990; Earle 1991a; Friedman 1975; Pauketat 1992).

But perhaps more often than not, especially in the case of large, regional, state-level societies, collapse is followed by substantial transformation, in which the post-collapse outcome bears little resemblance to pre-collapse conditions and polities. For example, petty states may form after the collapse of an empire, tribal organizations may emerge in the wake of a state's or chiefdom's collapse, or a complex alliance of transegalitarian societies may collapse into a mosaic of smaller, local groups. In this volume, Zagarell (Chapter 3) describes a post-collapse outcome that differs substantially from the sociopolitical milieu that preceded the emergence of a regional state in South India. Railey (Chapter 4) describes a collapse that involved a spatial displacement of the geopolitical center of gravity in Shang China, with the post-collapse outcome involving a rapidly unfolding florescence that, overall, outshined its pre-collapse predecessor in various cultural markers, such as artistic achievements and mortuary ritual.

TRANSFORMATION VERSUS COLLAPSE

Although the collapse of complex systems has always held a special fascination for archaeologists and historians, it is clear that not all cases of substantial—even rapid—sociopolitical reorganization involve wholesale collapse. In some cases, complex systems may be *transformed* (either rapidly or gradually) without a complete breakdown of economic structures, loss of complexity, political fragmentation, and demographic

reduction or displacement. Thus, *transformation* can occur independently of collapse and reorganization.

Whether a given sociopolitical system collapses or more gradually transforms into something else may depend in part on the inherent flexibility—or inflexibility—of the system itself in the face of changing conditions and historical circumstances. As noted above, those who advocate internal stresses as the root causes of collapse see complexity and long-term continuity among preindustrial societies as antithetical. Under this perspective, increasing complexity is synonymous with increasing rigidity such that complex systems are unable to adapt to changing conditions and circumstances (e.g., Adams 1978:333, quoted above).

But it is also conceivable that certain complex systems may be more inherently flexible than others, or at least at certain points in their own evolutionary histories, and may thus be better equipped to deal with, and adapt to, unforeseen challenges brought on by changing conditions. This does not mean that such societies gained this advantage through any special gift of foresight or enlightenment; rather, such positive survival prospects may have accrued through the essentially inadvertent emergence and coalescence of cultural marker traits and organizational characteristics over the course of a system's evolutionary history. It is also acknowledged that societies enjoying such an advantage at Point A in history may not enjoy the same advantages under different conditions at Point B, and a society that is able to transform itself at one point may be much more prone to collapse at another. The point is that the nature of human organizational and cultural variability is such that some societies may prove more able than others at adapting to changing circumstances by transforming themselves, thus avoiding wholesale collapse.

The Roman state is perhaps the best example of political resiliency and transformation in history.² Rome emerged as one of many cultures in the Italian peninsula during the Early Iron Age. By 575 BC, Rome had become a small urban center under Etruscan influence. The mid-sixth-century BC Roman state was monarchical, ruled by an Etruscan dynasty. The Roman king was assisted by his council of nobles (Senate) and a people's assembly. His military, judicial, and religious authority was symbolized in the *fascēs*, a small bundle of rods enclosing an axe.

The Roman Republic

According to Roman tradition, the nobles revolted in 509 BC and defeated their king. Rome became a republic.

Two elected rulers, called consuls, were elected by the popular assembly. The Senate advised the consuls and maintained the power of veto over their actions. The Roman magistrate grew with Roman military might, and specialized political offices, such as praetors, censors, questors, aediles, and promagistrates, were created to maintain the expanding state. Although greater democratic influences emerged between the fifth and fourth centuries BC (e.g., the tribal assembly, centuriate, and plebian council), the Senate eclipsed these bodies and became the primary executive power during the mid-second century BC. By then, Rome was a *de facto* oligarchy. Factional rivalries in the Senate eventually led to political support of military factions led by prominent generals (e.g., Caesar, Pompey) who used military support to push themselves into power. These leaders formed temporary alliances (e.g., the triumvirates) to rule Rome, which eventually fell in upon themselves. In 49 BC, civil war erupted between two triumvirate leaders, Caesar and Pompey. Caesar, the victor, had the Senate declare him "Dictator for Life" in 46 BC, but two years later he was assassinated by members of an opposing faction who feared the reemergence of a monarchy.

The Princes

Caesar's assassination led to a war between the republican faction and Caesar's successors, the triumvirate of Antony, Octavian, and Lepidus. The triumvirate triumphed, only to wage war upon itself. Octavian defeated the combined forces of Antony and Cleopatra at Actum in 31 BC. In 27 BC he adopted the title of Augustus, the first Roman emperor. The Roman state had transformed again, from an oligarchical republic to a "princely state." The Roman principate was an imperial system in which the emperor (the "princeps") was considered the first citizen of Rome. In this capacity he consolidated within himself many previously independent Senatorial offices (the proconsulship, tribunate, censorship, pontifex maximus, etc.) and became the primary executive authority. Nevertheless, he was not considered a monarch because the Senate retained some influence over his policies and retained the right to approve his successor. This right was vulnerable, however, because the emperors' designated heirs inevitably controlled large armies. The emperors expanded the imperial bureaucracy, the military, and the state infrastructure in order to maintain an expanding empire. The costs of these expansions resulted in increased taxation, which gradually led to economic downturns.

The Autocracy

By AD 235, economic downturns and inept emperors led Rome into a forty-year period of military mutiny and political disintegration. Multiple coups d'état and military mutinies, coupled with barbarian invasions, resulted in a rotation of new emperors, 26 in all, most of whom were assassinated within a year or two of their ascension. The military coups completely bypassed Senate authority, which withered into obscurity. Independent states broke away in the western (Gaul, Spain, and Britain) and eastern (Palmyra, Egypt, and Asia Minor) parts of the empire. Just as total political collapse seemed imminent, the empire was restored by the Emperor Aurelian in 275. The systemic reorganizations initiated by Aurelian and his successors, such as Diocletian and Constantine the Great, completely excluded the Senate from civil and military administration. Emperors now ruled as complete autocrats, their nomination sealed by the gods and the military. As evidence of such, they adopted the diadem, a symbol of autocracy since the ancient Hellenistic kings.

The Byzantine State

In 324–330, the Emperor Constantine the Great established the city of Constantinople in Asia Minor. His sons initiated an informal split of the Empire into eastern and western halves ruled by co-emperors residing in Italy and Constantinople, respectively. This informal split became formal in 395 when each part of the empire adopted separate legislation. After multiple barbarian intrusions and de facto control of the western half by barbarian “Masters of Soldiers,” the western empire finally dissolved completely in 476, when the barbarian king Odovacar became King of Italy. The eastern, or Byzantine, empire continued until it was conquered by the Turks in 1453.

While the political transformations of the Roman state are impressive, the cultural changes to Roman civilization that accompanied these changes are equally dramatic. After the conversion of Constantine the Great, the Roman empire became increasingly associated with Christianity. The reorganized imperial bureaucracy led to the creation of new political, religious, and military titles, such as dukes, counts, and vicars, which preceded the development of the medieval state. The Roman army replaced the metal breastplate, short sword, broad shield, and javelin with a leather jacket, chain mail, long sword, small round shield, and lance. Late Roman art reflected only few influences from its Classic past, became

increasingly medieval in nature and design, and was strongly influenced by Christianity. Finally, the Byzantine state, which still considered itself the Roman empire, was ruled by divinely sanctioned, autocratic kings. The state religion was Eastern Orthodox Christianity, and the official language was Greek. It is safe to say that a Roman magistrate from the Republican period transposed by some magic to Byzantine Constantinople would not know that he was still in the Roman Empire and might not even be able to ask where he was in a language that could be understood by the imperial capital's citizens.

Like collapse, transformation may result in the slow death of a sociopolitical system, out of which emerges a polity, or multiple polities, that bears little resemblance to that from which it (or they) emerged. Among those who have voiced the argument that Rome, in fact, did not collapse was Bowerstock, who instead recognized that Rome underwent “transformation, reformation, and relocation” (1988:171). As a result of this transformation, the Roman Empire *eventually* fragmented and a mosaic of very different social and political systems emerged in its wake, with the Vatican remaining as the modern-day political vestige of this once far-flung empire.

Whether one chooses to interpret a particular case study as an episode of collapse or as a much less traumatic cultural and/or sociopolitical transformation may essentially boil down to one's own conceptual inclinations, which are often influenced by theoretical currents of the moment (and the same holds true for interpreting the available evidence in terms of internal vs. external factors). Archaeological case studies—even extremely well-documented ones—are subject to the formulation of different explanatory scenarios, even competing ones that may be equally plausible given current evidence. The differences may come down to semantics or differing conceptualizations, including one's own working definition of “collapse,” and the appropriate scale at which patterns must be apparent before one points to them as a case of collapse. The issue may also boil down to the factors, conditions, and cultural markers that a particular researcher chooses to focus on.

THIS VOLUME

To update our understanding of collapse and transformation of complex systems, this volume highlights case studies from around the globe. This book is a spin-off of a symposium of the same title, presented at the 2000 Society for American Archaeology (SAA) meetings in Philadelphia, organized by the volume editors. Not all of the participants in the symposium chose to include their

papers to this volume. The ensuing chapters begin with case studies set in Eurasia and Oceania and then proceed to those from the New World.

With its global scope, this volume introduces these region-specific studies to a wider audience and highlights their relevance to broader, theoretical concerns. The contributions reflect a healthy diversity of ideas that collectively enhance our understanding of collapse and

transformation. Also, unlike most previous approaches to collapse, many of the case studies presented here deal with the collapse and transformation of *prestate* societies. As such, this volume pushes the study of collapse and transformation into new directions and pursues more general inquiries into the operation of complex systems, the evolution of human societies, and the general condition of the human species and its prospects for the future.

NOTES

1. Note that, under Bronson's definition, it can be argued that barbarians are present even in today's world. Take, for example, the "tribal" groups of western Pakistan and most or all of Afghanistan, who have remained essentially beyond the control of those nations' central governments since the time when states first formed around them. It is no accident that many global terrorists have gravitated toward these groups

and taken up residence among them. From these non-state territories, terrorist groups have harassed the United States and other modern states, whose response to these attacks is proving difficult, costly, and disruptive.

2. Reference sources for this general discussion of Roman history include Sinnigen and Boak (1977) and Ostrogorsky (1969).

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Anthropological Papers No. 8