

Networks, Territories, and the Cartography of Ancient States

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With broad lines and dark shading, the cartographic depictions of ancient states and empires convey the impression of comprehensive political entities having firm boundaries and uniform territorial control. These depictions oversimplify the complexities of early state growth, as well as overstating the capacity of central governments to control large territories. Archaeological and textual evidence suggests that ancient states are better understood through network models rather than bounded-territory models. Network approaches enable us to depict competition within and among polities as they grow, the efficient use of nodal points as a focus for political leaders, and the realities of nonoverlapping ritual, social, and economic activities that have an impact on political cohesion. Network maps and bounded-territory representations are compared for the Inka, Mauryan, and Sassanian polities. *Key Words:* *archaeology, cartography, history, networks, territory.*

In the past two decades, cartographers and social theorists have observed that the way in which maps are drawn leads viewers to particular conclusions about the phenomena depicted therein (Peters 1983; Murray 1987; Harley and Woodward 1987; Harley 1988, 1989; Wood 1992; Bord 1995; Gascon 1995; Azevedo 1997; Black 1997; Crampton 2001; Vijačović 2002; Perkins 2003). Indeed, the visual stimulus of a map may be more powerful than the scholarly text that accompanies it. As Rehav Rubin (1992, 15) notes, "By supplying a visual image the map gives another dimension to the image it represents, and restricts, or even overtakes, the freedom of its reader to create an image of his own" (see also Bord 1995, 61). Scholars have recognized that maps and other representations are consciously created and manipulated, with implications for contemporary linguistics (Urciuoli 1995; Guentcheva 1999), cultural anthropology (Wolf 1982, 7), modern history (Winichakul 1994; Howell 2001; Diener 2002; Manz 2003), historical linguistics (Gal and Irvine 1995; Ehret 2001; Schoenbrun 2001), and political science (Murphy 1996, 2002).

The understanding of maps as interpretive documents has, however, had relatively little impact on depictions of the premodern past. Archaeologists' and historians' illustrations of ancient states and empires tend to be of the absolutist variety, in which firm boundaries and homogeneous control of territory are implied by the use of shading that covers continental-sized portions of the landscape (Figure 1). Archaeologists, particularly those trained in the prevailing Euro-American anthropological tradition, tend to take a synthetic and comparative approach to their data by invoking the presence of cultural

universals and a view of ancient cultural groups as "systems" with a series of inputs and outputs. Furthermore, the typical inclusion of only one territorial map in a textbook or research paper implies that a state or empire was always growing toward its eventual borders in a kind of long-term manifest destiny. The implications for understanding these ancient polities are significant since in a single-map scenario, the multiple stages of state growth, from an initial development encompassing small and disparate territorial groupings to an eventual collapse or fragmentation, are aberrations from the "normal" view of states as irreducible wholes.

The postmodern critique of the systemic bias in archaeology has been accompanied by a call for particularistic and historical approaches (e.g., Hodder 1986; Shanks and Tilley 1987; Shanks and Hodder 1995). Nonetheless, critiques of representation principally have been based on philosophical differences related to epistemology rather than the literal representation of ancient peoples (but see Shanks 1997 on archaeological photography). New technologies, such as geographic information systems (GIS) have largely been utilized to "manipulate and analyze map data" more efficiently rather than serving as a basis for questioning the role of maps (Gaffney, Stančič, and Watson 1996, 132; see also Lock and Stančič 1995; Aldenderfer and Maschner 1996). To date, critiques of maps are peripheral to the discussion of the entities depicted, with systemic archaeologists focusing instead on how to render complex three-dimensional GIS images into reader-friendly form (e.g., Miller 1995) and postmodern scholars evaluating the difference between Western and non-Western images. Bender (1999, 42), for example, examines the way



Figure 1. A typical map of the Roman Empire (after Casson 1998, 4).

in which precolonial native or aboriginal “mental maps,” gleaned from ethnography, contrast with the “abstract knowledge” of colonial documents in an approach that mirrors the legal evaluation of cultural memories and land claims (e.g., Reilly 2003). Although the implications of archaeological maps have heretofore escaped scrutiny, a scholarly understanding of the similarities between modern and ancient states points toward the need for a revised cartography for ancient exemplars. Over twenty years ago, Eric Wolf (1982, 7) cautioned that “the habit of treating named entities such as Iroquois, Greece, Persia, or the United States as fixed entities opposed to one another by stable internal architecture and external boundaries interferes with our ability to understand their mutual encounter and confrontation.” That this goal has gone unfulfilled in the realm of representation is signaled in a recent paper by Richard Wilk (2004) in which he criticizes archaeologists for blindly following the tradition of mapping culture areas with distinct boundaries and urges the recognition of cultural trajectories that may have attenuated edges in both space and time.

Wilk’s observations about the need for new mapping strategies to understand the development of ancient states and empires resonate in other recent publications that examine the nodal points of polity growth and the interstices of state-level control. In his discussion of the

Inka, Covey (2003) rejects the prevailing view that the fifteenth-century Inka polity was brought into being by a single “great leader.” Instead, he notes that the process of integration had a longer trajectory of nearly two centuries and that even at the height of imperial power, the Inka lacked uniform control such that even “some groups living close to [the capital] Cusco managed to resist incorporation into the Inka state until quite late” (Covey 2003, 339). Similarly, Charles Golden’s (2003) study of the Maya-period Yaxchilán polity of the Usumacinta Basin shows that boundaries were flexible, porous, and constantly redefined. Leaders based at the central Yaxchilán site made selective ritual investments in smaller regional centers that served as the frontier with competing polities, and inscriptions recorded “the history of marriages, royal and noble visitations, and warfare events that bound the centers of the Usumacinta together in a dynamic process of political interaction” (Golden 2003, 35).

The strategies of political manipulation, communal organization, conflict management, and social cohesion that characterize modern states are present in ancient exemplars. Successful states, both ancient and modern, share a number of characteristics: they assemble political hierarchies from numerous discrete, often warring, parts; their initial development of centralized authority is simultaneously dependent on the accumulation of

resources and the suppression of competitors; and their maintenance would have required continuous negotiation, alliance building, and selective use of costly and risky investments such as warfare. Scholars have noted the difficulties of forcing uniform definitions upon these complex societies (Cohen 1978, 4; Feinman and Neitzel 1984; Yoffee 1993), as well as noting the demonstrated frequency of collapse from strongly centralized states to a fragmented political landscape and back again (e.g., Blanton et al. 1996, 13; Marcus 1998, 2003, 89; Adams 2001; A. T. Smith 2003, 192).

By viewing ancient states and empires as undergoing the same managerial stresses as modern states, we can correct the now implausible cartographic suggestion that maps of recent empires should be viewed as conditional or situational but that maps of the ancient world can retain an absolutist stance. In a recent article, Jeremy Crampton (2001, 238) has advocated that one of the goals of map making should be exploration of data rather than the singular presentation of results (see also Czerny 1993). Since “mapping engenders new and meaningful relationships among otherwise disparate parts” (Corner 1999, 229), cartographic depictions should be viewed as powerful analytic approaches to historical and archaeological evidence. Given the speed of alterations now made possible by GIS and computerized cartography, the display of multiple maps can be accomplished rapidly with significant implications for mapping complex scenarios based on different criteria (e.g., Bord 1995, 61; Cromley 1999).

The Concept of Boundaries and the Political Uses of Maps

States and empires are relatively recent phenomena in human history, with the earliest exemplars visible in the Near East by 6,000 years ago; in the Americas, the most complex indigenous political forms appeared only 2,000 years before European contact (Alcock et al. 2001). The cartographic depiction and analysis of both ancient and modern political entities stems from a modern view of the necessary interdependence of political authority and physical territory; as David M. Smith (1990, 5) has observed, we are so used to the idea of a territorial nation-state that it is difficult to think otherwise. But the view of a nation as a specific and bounded geographical entity is a historically created condition. Our current notions date to seventeenth-century Europe, when the development of national ideas of delimited space occurred simultaneously with com-

mon property laws predicated on the division of the landscape in which ownership was absolute, boundaries were fixed, and legal restrictions were placed on trespass (e.g., Grosby 1995, 146; Turner 1999; Hardt and Negri 2000). This emphasis on boundaries and exclusion, as well as property owners' control of both usufruct and soil, were key features incorporated into the concepts of both individual and state-level property rights. Cartography, land surveys, and other forms of territorial measurement were brought into the service of property owners, and maps became the “means by which either the state or individual landlords could more effectively control” their populations (Harley 1988, 284; see also Murphy 1996).

The notion of territoriality as an integral component of government quickly became applied to ancient states as well. A. T. Smith (2003, 87) notes that Lewis Henry Morgan, in his seminal *Ancient Society*, “established the state as a particular subset of government, originating in Solon's Athens and the Roman republic, founded on territorial differentiation and, more importantly, on political rule centered on the protection of property and organized by wealth.” An expectation of state control over the landscape was subsequently adopted by twentieth-century theoreticians of the ancient state, who incorporated both kinship and the concept of a qualitative shift to bureaucracy as a governing mechanism: “The state and its subdivisions are organized as territories—territorial entities under public authorities—as opposed, for instance, to kinship entities under lineage chiefs” (Sahlins 1968, 6; echoed in Billman 2002). Further elaborating on this concept, Carneiro (1987, 245; see also Carneiro 1970, 733) has proposed that the “state is an autonomous political unit, encompassing many communities within its territory, and having a centralized government with the power to draft men for war or work, levy and collect taxes, and decree and enforce laws.” Similarly, Hansen (2000, 13) sees as the state's essential features “a centralized government in possession of the necessary means of coercion by which the legal order can be enforced in a territory over a population,” while East (1965, 98) stresses that “at all stages of its history a state has more or less known limits where it impinges on territories outside its jurisdiction and control.”

The use of a territorial definition for both modern and ancient states suggests that “states” are understood as having an organizational quality that remains constant through time. This view is reinforced by historical documents in which political leaders utilized the idea of a controlled and homogenous landscape as part of their ideology of domination. For example, the Sumerian King List of the late third and early second millennia BC is a

compilation that “simultaneously flattens and stretches the Mesopotamian geopolitical landscape, compressing rulers known to have been contemporaries into a sequential order and stretching the territory of each ‘Great Power’ to include all of Sumer and Akkad,” although moments of actual consolidation were rare (A. T. Smith 2003, 144–45). Inheriting this literary tradition, the Assyrian ruler Sargon II (eighth century BC) says of his enemies that he “captured all of their lands and brought them within the borders of Assyria” (Grosby 1997, 4). And in the autobiographical *Res Gestae* of the first-century AD, the Roman emperor Augustus recounted that he had “extended the borders of all the provinces of the Roman people,” including new forays into Ethiopia, Arabia, Egypt, and central Europe (Shipley 1998 [1924]).

Rulers’ use of territorial imperatives for expansion and control plays upon a deep human interaction with landscape and sense of place. Steven Grosby (1995, 147) has observed that territoriality is an ideological phenomenon, in that “territory is not primarily the spatial location of interaction; rather it is *in* the image of the territory . . . that individual members of the collectivity participate” (emphasis in original). Thus, territoriality becomes part of the ideology of group life absorbed by individuals who view the landscape as a whole, unbroken entity to which there is a sense of belonging. Ancient leaders, no less than modern ones, seized upon this social identification of landscape to promote a sense of unity and homogeneity. Archaeologists and historians have also settled upon the idea of a bounded zone as an appropriate method of analysis for ancient polities. John Cherry (1987) notes that it is advantageous for archaeologists to think of states as territorially bounded, just as rulers see states that way. The idea of territory thus becomes a convenient fiction for both modern analysts and ancient rulers, built upon a landscape abstraction.

There are significant costs incurred, however, in the logistics of managing a landscape. In order to implement the structure of the state (including bureaucracy and, often, sources of both coercion and cooption in the form of rewards) states need to accumulate and spend surplus at the central level. In practice, especially in the earliest stages of state formation, those surpluses are usually limited so that some potentially desirable actions cannot be achieved. As a result, very expensive actions such as boundary maintenance are mostly done by default rather than by the installation of an actual defended border with a physical perimeter. Even between modern nation-states, borders do not often consist of a physical impermeable barrier, and boundaries may be left as dotted lines on a map when the cost of firm delineation is

considered too high or carries too severe a political price (examples include the boundaries between Ecuador and Peru and between India and China; M. L. Smith 2001, 7). In some cases, such as between Yemen and Saudi Arabia, multiple and overlapping boundaries have been left to stand uncontested until such time as resources have been identified, thereby triggering a border dispute (Schofield 1996; Figure 2). And in addition to dry-land boundaries, modern state boundaries are contested over aquatic and subterranean maritime resources, riverine access, islands, and uninhabitable zones (e.g., the Antarctic and even the moon; see Joffé 1996; Davis 1997; Budrewicz 2001).

States are also fragmented in other ways besides the demarcation of the lines separating them on maps. States are not homogenous cultural entities, and can be subdivided along a number of different planes by significant and competing subgroups with widely divergent interests (Murphy 2002). Anthropologists, cultural historians, and political scientists have increasingly noted that the “boundaries” of states are subject to considerable, and sometimes very rapid, manipulation. In addition to globalization, in which political boundaries are being replaced by economic ones, there are strong cultural, linguistic, or ethnic boundaries that extend or limit the effective political boundaries of the state in which they are located (e.g., Grosby 1995, 1997; Urciuoli 1995; Foote, Tóth, and Árvay 2000). The realities of state disputes, however, continue to be outweighed by the notion of inviolable state territory, with the result that “it is easy to overlook the relatively recent origin of the idea of congruence between a people with shared characteristics and the spatial expression of their political organization” (D. M. Smith 1990, 5). Although territories are considered the ideal unit of sociopolitical unity, analysis of ancient and modern states indicates that such an approach conceals the mechanisms by which such groups are established, grow, and function. States (and indeed, all other human sociogeographic units) can be analyzed as networks of resource acquisition in which territories and their boundaries are porous, permeable, flexible, and selectively defended.

Making Archaeological Maps

When describing the ancient world’s most successful political groups, archaeologists and historians have today largely replaced the subjective concept of “civilization” with the terms “state” and “empire.” Often used interchangeably, these terms define entities with a considerable development of social and political complexity beyond what would be controlled by a single regional

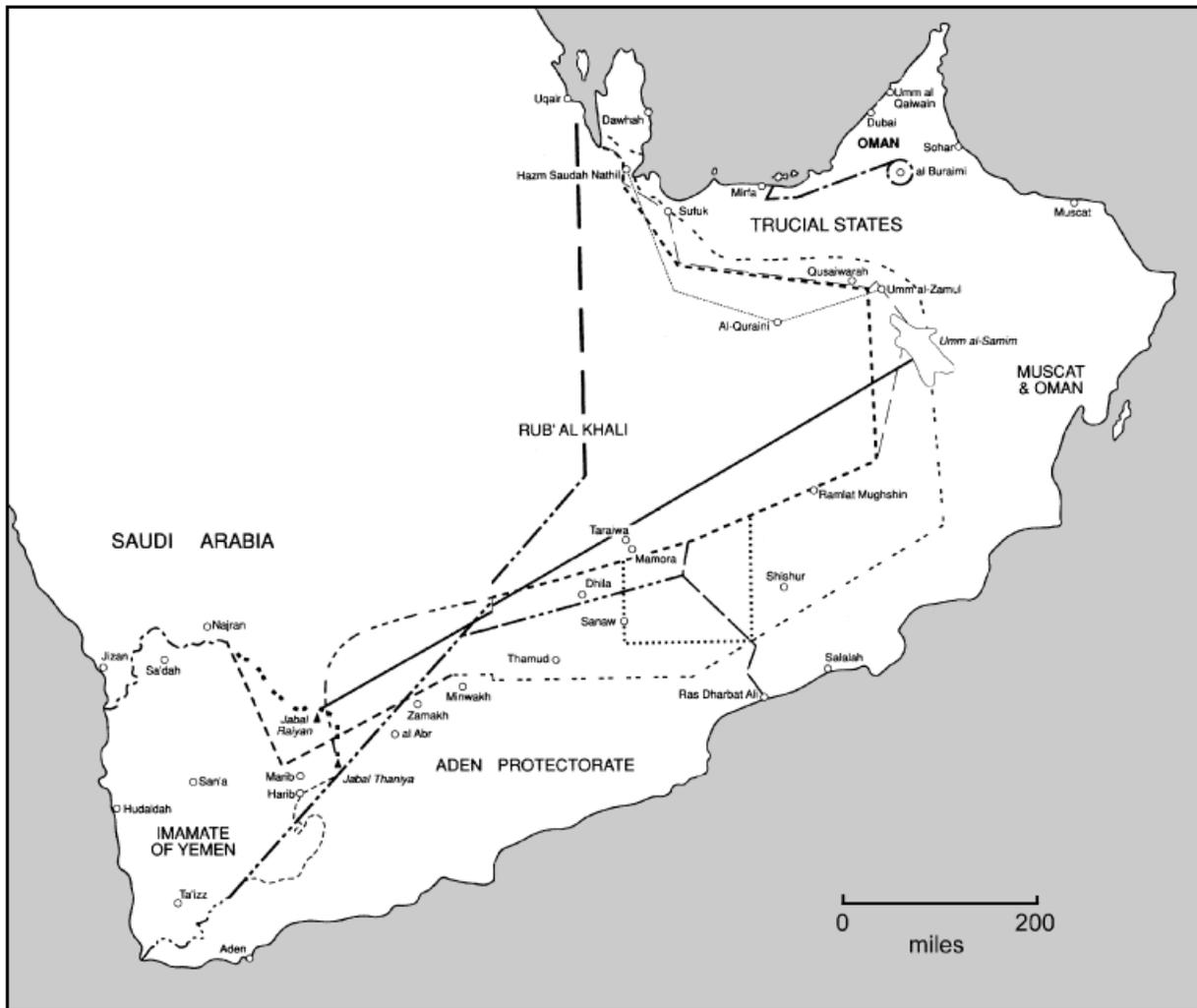


Figure 2. The borders of the nations of the Arabian Peninsula in the 20th century (after Schofield 1994, 22–23).

chief or collection of tribal groups. An ancient culture is determined to have been a state or empire on the basis of population size and ethnic diversity, evidence for economic and ecological diversity, and a centrally organized bureaucracy with a hierarchy evident in the levels of administration (Fried 1967; Flannery 1972; Wright 1984, 1986; Johnson and Earle 2000; Spencer 1997; Feinman and Marcus 1998). States usually are identified with powerful rulers, a Cleopatra or Montezuma whose name is associated with particular conquests and historical trajectories but whose success is predicated upon the management of the many hundreds of individuals who conduct the quotidian business of taxation, tribute, infrastructure, ritual performances, civic order, and military action. These routine activities have left the traces that serve as the basis for mapping the locations of ancient bureaucratic control and are principally assessed through historical records and archaeology.

Most ancient states either had a documentary tradition or were incorporated into their successors' historical records. Texts may list or describe provincial capitals, tax stations, forts, and routes built by a centralizing authority. They also identify political alliances made through treaties and marriages, as well as the location of battles. Monumental inscriptions, such as dedicatory placements, tombs, and milestones, all serve as fixed place markers of an ancient state's conquests. The strength of the written word (cf., Goody 2000) makes these textual sources a particularly strong anchor for the interpretation of state-level authority. The physical evidence of past human activity also consists of artifacts and architectural remains. Archaeologists use the techniques of systematic survey and excavation to recover these materials, recording their locations and contexts as well as distinctive markers of style that can provide chronological or cultural affiliation. While excavation is the

better known of the two methods, the very intensive and time-consuming nature of excavation means that it can be applied to only a limited number of places. As a result, excavation at an archaeological site is usually complemented by survey data of a larger surrounding area in order to locate associated sites as the first step toward understanding their interrelated social, political, and economic characteristics (e.g., Plog, Plog, and Wait 1978; Cherry, Davis, and Mantzourani 1991; Steinberg 1996; Terrenato and Ammerman 1996). Survey is carried out at different scales of intensity, from aerial or satellite prospections that tend to identify only the largest sites in an area, to pedestrian surveys in which individuals traverse the ground by foot and record the presence of architectural remains and artifact concentrations.

Both historical and archaeological information consist of point-specific phenomena, whether in the form of places mentioned in texts or locations where inscriptions or artifacts are found. A simple exercise of “connect the dots,” accompanied by an overlay of shading and with a generous margin around the outermost points, completes the map-making exercise and results in a picture of a shared cultural and bureaucratic zone. The resultant straightforward simplicity of a territorial map has considerable appeal on a number of levels. A graphic representation can distill a complex archaeological or historical argument into an easily visualized conclusion. The uniform presence of a large political entity on a map enables the viewer to consider the geographic circumstances, neighbors, and environmental parameters of the polity. But the resulting cartographic depiction also suggests that all portions of the area were equally controlled by the centralizing authority evident in historical documents and in the region’s largest sites. Viewers may unwittingly assume that the entire shaded area is equally complex and integrated so that if we were to take any portion of that territory, even where few sites have been found, we would be able to discern the same large-scale organizational mechanisms.

One reason that historical and archaeological reconstructions of ancient polities are conditioned by contemporary perceptions of the inviolate nation-state is that data from the past are often limited, biased, or incomplete. Ancient historical sources, written from the point of view of an aspiring central authority, may overstate an enemy’s strength to gain support for extensive military campaigns or underplay military losses to keep morale high. Battles or alliances that are used by today’s cartographers to anchor the borders of empire on a map may not be the markers of a firm territorial boundary but may have instead represented a resource

(such as a city, trading station, or mineral ores) that lay between competing state systems and that was controlled only occasionally by any given political group. Physical markers such as inscriptions, tombs, and other monuments may commemorate temporary alliances whose affiliations were otherwise ephemeral (e.g., Porter 2001). An inscription can quickly pass into irrelevance although the monument to which it is attached remains standing, with a longevity in the landscape that may mislead us into thinking of its dictates as representative and permanent. Monuments in the landscape read by historians today as political manifestations may instead have been of a primarily religious or ritual composition, such as the depictions of Aztec gods found in the distant hinterland regions of the Mexican highlands that are close to ritually important natural phenomena but distant from Aztec centers of political control (Umberger 2002).

Textual sources in document form have other limitations since the versions that we have today are often copies made much later than the original composition and in which copyists added anachronisms and addenda from their own eras. These layered texts can make subsequent interpretation extremely difficult, especially when they are of a strongly descriptive nature and are used to make considerable claims for early imperial control or administration. Historical texts can also conflate several generations of activity into a single phase, especially when there are successive rulers with similar names, as in the Sassanian case (Frye 1983). Inscriptions and papyri can be dated quite accurately if their authors included a numerical reckoning, but multiple calendars may have been in use simultaneously and scholars do not always agree on the way in which the given date corresponds to our AD/BC calendrical system. While some of these dating discrepancies are of relatively minor consequence for understanding long-term historical change (such as the ten-day difference between the Gregorian and Julian calendars), earlier calendrical systems known to have been in use simultaneously in the ancient world can represent offsets of several decades or more. The interpretation of inscriptions on stones, coins, and other durable surfaces can be dated stylistically, but there can also be cases of archaizing script that render the resultant interpretation of their date to be artificially early. In sum, while historical texts present a variety of facts of occupation, governance, and control, they may not describe consistent or long-standing conditions.

Archaeological information is similarly subject to a variety of unavoidable constraints. Archaeologists can record the precise find-spots of sites and their associated

artifacts, enabling the relationship among those materials to be placed on the map. But the archaeologist also must provide an interpretation of the meanings of proximity and distance. Because of trade, raids, and other vectors for the transportation of objects, there can be a distribution of artifacts well beyond the areas in which they were originally produced. Although some artifacts may be considered “elite,” signifying a political link among sites’ inhabitants, our assessment of ancient aesthetics or perceptions of luxury is difficult to substantiate (e.g., Glennie 1995; Douglas and Isherwood 1996 [1979]; M. L. Smith 1999). In addition, artisans can copy imperial styles to suit local tastes, resulting in an apparent distribution of imperial “style” (in pottery, textiles, and architecture) that may imply imperial domination but is really only a fashion statement. Finally, the use of an old-fashioned decorative style can also mislead scholars’ assessments of their date of manufacture and use.

Chronological limitations also are unavoidable. Excavations enable a highly precise sequencing of events that can be “read” as archaeologists peel back layers of occupations, but similar chronological limitations apply since dating techniques such as radiocarbon (C14) yield a date range with a plus/minus factor of fifty to seventy-five years. The problem of chronology also extends to archaeological survey. Individual sites or artifacts are often difficult to date more precisely than by a factor of one to two centuries, as the sites are dated by pottery and other surface finds whose styles can be broadly dated to certain cultural periods. Coinage and other small portable items are particularly difficult to use as the sure indicator of contemporaneity or cultural affiliation since value can be carried both forward in time and outward in space. Sites in a landscape that therefore appear to be contemporaneous may actually represent sequential occupations. Sites as they are found also have undergone processes such as erosion and rebuilding that may obscure the earliest remains or otherwise de-emphasize some periods of occupation (Adams 1981, 47–51; Schiffer 1987; Gilman 1995). In sum, contemporaneity in archaeological and historical maps should be viewed as the hypothesis upon which further research is based, rather than an immutable conclusion about the relationship among sites.

The Depiction of Ancient States as Networks

The traditional view of a state consisting of an all-powerful center that systematically absorbs and controls outlying areas can be challenged for the premodern period, just as it has been critically evaluated for states of

the present day. Historical and documentary evidence demonstrates the opportunistic nature of political expansion, and archaeological evidence of conquest and assimilation can be evaluated as a sequence of cultural contacts rather than a marker of absolute political control. A network model of ancient states enables us to examine more accurately the mechanisms developed to manage the inherent economic, social, and political challenges to the imposition of state authority. As their name implies, networks are structures for interaction that include component parts linked not only to a single central point but also to each other. In a network, nodes and connectors are dependent upon each other, with a large potential number of combinations that enable those links to be sustained in a robust but flexible manner.

A spiky, node-and-connector model of political interactions characterizes the workings of ancient states and empires more effectively than the prevailing blob-like territorial model (M. L. Smith 2002; see also Wilkinson 2003, 82). States expand when they create new networks and when they take over networks created by others and collapse when their networks of interaction are broken. A variety of strategies can result in increased network connectivity: states can take advantage of local quarrels among neighboring chieftains, holding out credit and assistance until the whole area becomes annexed through a process of “dividing and conquering.” State leaders can extend their control to adjacent regions through intermarriage or adoption, as well as by assassination. All of these can add contiguous or noncontiguous areas, which may in turn serve as a geographic basis to fill in the interstices of the network. States can also acquire noncontiguous zones through colonization (which leapfrogs the landscape to create a new node), in which the interstices can be filled in opportunistically. Understanding states as networks also recognizes that each node (such as a town, city, or natural resource zone) competes for advantageous links with the political leaders of expanding polities.

Depictions of states as networks of nodes and connectors can be undertaken using available archaeological and historical data. Given today’s advances in imaging capacity and GIS, multiple maps can be easily generated, permitting a time-based assessment of spatial use that goes beyond the conceptual fiction of a single exemplar showing a state or empire only at its maximal extent. Sites such as habitations, resource locations, ritual centers, and other places of human investment in the landscape serve as nodes, while links exist in the form of roads, canals, and other linear traces between sites. Three case studies of ancient states—the Inka, the

Sassanians, and the Mauryans—enable us to evaluate the merits of a network-mapping approach as a better way to represent the dynamics of state formation and growth.

The Inka Polity

The Inka, or Tawatinsuyu, state of the South American Andean region developed and flourished from AD 1400 until 1532 when it was defeated and subsequently controlled by the Spanish (Morris 1998; D’Altroy 2001; Stanish 2001). The standard cartographic display of Inka territorial authority (Figure 3) is based on the distribution of material goods in “Inka” style, the presence of Inka-type architecture such as storage facilities, and historical records made by the Spanish at the time of their arrival and conquest. The implied integration of a large area is particularly striking when topography is

considered since the shaded area encompasses coastal shores, tropical forests, and the peaks of the high-altitude Andes. Covering nearly all of the area of modern Peru, signs of ancient Inka hegemony can also be found in portions of present-day Argentina, Ecuador, Bolivia, and Chile.

The shaded boundary map of the Inka polity implies widespread control of a large and diverse portion of South America wherein many previous smaller-scale chiefdoms and states had also flourished. The Inka were able to make use of these previously existing population centers to sustain their rapid growth and control of a large area. Politically, their strategies included the absorption of well-organized polities (such as the Chíncha of the Peruvian coast), as well as the development of a bureaucratic hierarchy that could be imposed upon smaller-scale tribes and chiefdoms throughout the region (Morris 1998). While some of this integration was achieved through appeals to religious and kinship ties, other conquests were achieved through warfare and the outright seizure of resources (D’Altroy 2001, 206). The Inka were also particularly adept at managing human labor, whether through the forced removal of people to new locations or the development of craft-manufacturing quarters where kingly goods were made (La Lone 1982; Hyslop 1990).

One of the most important mechanisms of integration and administration was the Inka road system (Hyslop 1990, 274–79; 1991; Morris 1998, 303; D’Altroy 2001; Figure 4). As access routes for the movement of people and goods, these formalized roads were created to provide access to population centers but also to serve as a cost-effective reminder of state authority in otherwise-remote regions for which there was little other daily evidence of Inka investment (Hyslop 1991). The Inka roads varied in the amount of labor investment evident in their construction, with types of construction ranging from 25-m wide roads at valley entrances to mountain pathways marked by wooden stakes or piles of stones (Hyslop 1991, 29–30).

When viewed as a series of network links, the Inka road system encompasses a large amount of empty space in the Andean region in which there were few resources or inhabitants. Rather than being uniform or homogeneous, these links show that Inka state control was concentrated on nodes of population and economic activity as well as on the means of moving between them. Craig Morris (1998, 295) has noted that flexibility was a key component of Inka administrative success. Flexibility was implemented through selective investment in a network of links and nodes as component parts of imperial strategy, and the capture and use of previously



Figure 3. The Inka empire (adapted from Stanish 2001, 214).

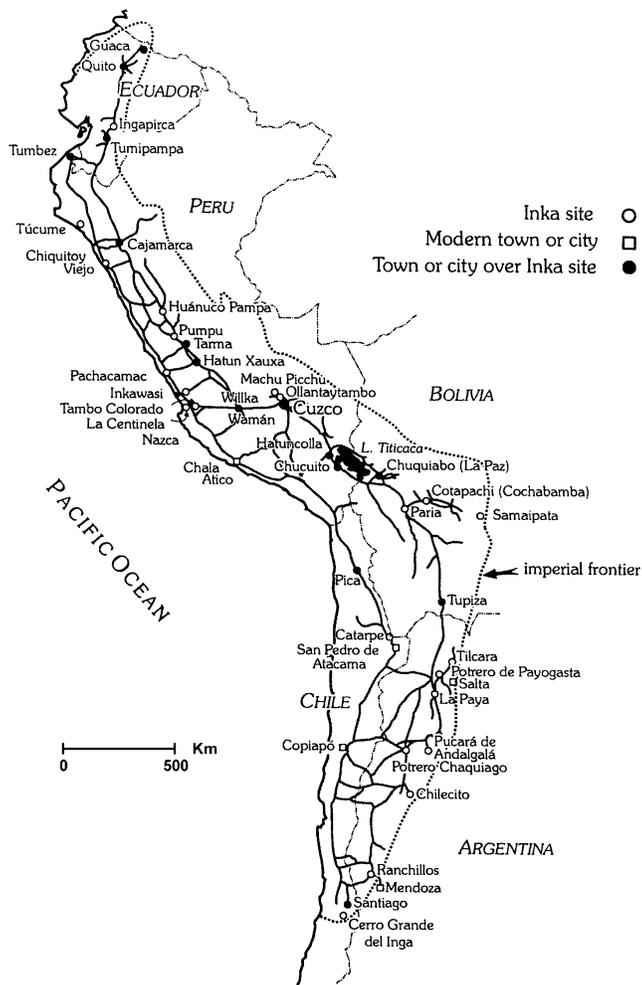


Figure 4. Major roads and sites of Inka empire (adapted from D'Altroy 2001, 211).

existing nodes helps to explain the Inkas' rapid consolidation. At the same time, the essentially weak nature of those ties helps to explain conflicts sustained with local leaders throughout the period of Inka expansion and the ease with which the small Spanish invading force undermined the state.

Finally, a nodes-and-corridors model may also more closely approximate the way premodern rulers actually conceptualized the workings of their domains. As the sixteenth-century writer Cieza de León observed, "The Inkas understood or conceived of their domain through roads, and not through provinces" (cited in Hyslop 1990, 58).

The Sassanian Polity

The Sassanians occupied Mesopotamia starting in the third century AD, administering a state that encompassed large portions of Iran, the eastern Arabian coast,

and Oman (Frye 1983; Howard-Johnston 1995; Donner 1999; Figure 5). As the principal rival of the eastern Roman (Byzantine) Empire, the Sassanians succeeded in conquering from them present-day Egypt and Turkey in the early decades of the seventh century, and their control of core regions of Mesopotamia and Iran lasted until they were defeated in AD 637 by the newly empowered Muslim armies of the nearby Arabian peninsula.

The scale of Sassanian authority is measured by the size and diversity of hinterlands united under their rule as well as by their sustained efforts of conquest and administration. Under pressure from the well-organized Byzantines to the west, the Sassanians were still able to campaign simultaneously on several extended fronts, fielding armies of 60,000 men while also building canals and defensive works throughout their domains (Howard-Johnston 1995, 167; Simpson 1997, 242). Over the course of four centuries of rule, the Sassanians were able to transfer power successfully from one ruling generation to the next, install and maintain taxation and judicial systems, and construct a number of new towns and cities. They were the beneficiaries of extended trade routes that crossed Asia to meet in southern Mesopotamia and implemented an economic system that included seals for transactions and a standardized system of coinage.

The Sassanians' capital at Ctesiphon (near present day Baghdad) was only one of the many urban centers controlled by the state. Their rivalries with Byzantine rulers often involved the capture and recapture of nodes such as the cities of Nisibis and Carrhae in eastern Turkey, and new cities as showplaces for conquest and administration were also founded. The prominent ruler Shapur I, ruling in the third century AD at the start of the dynasty's expansionist period, founded Bishapur in Iran and may have brought Roman artisans to work there, as suggested by the presence of Roman-style mosaics in the city (Frye 1983, 127). The density of cities throughout the Sassanian empire was impressive, including many without known names documented through archaeological survey in Iran and Iraq. Adams and Nissen (1972, 62–63) in their archaeological survey of a 75 × 125-km area in southern Mesopotamia recorded six centers of urban population, while Wenke (1987, 255) documented the presence of at least three large cities in his survey of a much smaller portion of western Iran.

In addition to the creation and management of nodes such as cities and fortresses, two types of linear features characterize the hinterland investments of the Sassanians. Like other Mesopotamian groups before them, the Sassanians built massive canal systems, particularly in the southern regions (Adams and Nissen



Figure 5. The Sassanian empire (adapted from Van Noten 1993, 12).

1972; Figure 6). These canals linked principal settlements located along main canals with smaller settlements at the connecting points where canal branches met (Adams and Nissen 1972, 62). In the north portions of their domain, Sassanian investments came in the form of linear defense works such as the 175-km long, 10-m wide construction known as “Alexander’s Wall” stretching from the Elburz mountains to the Caspian sea in northeastern Iran (Simpson 1997). Another set of defenses closed off the western region of the Caspian, including a set of parallel stone and mud-brick walls each more than 30 km long and augmented by dozens of small forts (Howard-Johnston 1995, 191–92).

The Sassanian case shows the way in which selective central investments resulted in control of important node-based resources such as human labor power and agricultural territory, linked by investment in corridors such as canals and fortification walls. Other corridors had been in place prior to the Sassanians, such as the trade routes that led from the southern Silk Route to the Mediterranean and from which a significant portion of Sassanian wealth was derived. New linkages came in the form of linear features established with specific goals, whether it was the management of newly conquered domains or the development of agricultural lands adjacent to population centers. Sassanian investment in frontier defense was spectacular but strategic, in which

long walls and fortified cities were used to monitor the movement of peoples across boundaries at critical junctures (Simpson 1997). Canal systems traversed otherwise unusable spaces, cutting the distance between population centers and providing agricultural infrastructure that facilitated the development of new settlements.

The Sassanian case shows that networks can grow both from the linkages made between population centers and as a result of new linkages to which population is drawn. In their survey, Adams and Nissen (1972, 62) noted that archaeological evidence in the form of pottery and brick fragments traced out “an irregular but almost continuous ribbon of built-up settlement along the levee of the main east-west trunk canal.” The primacy of linear features in network growth may offer an explanatory sequence of state-level development in other cases where networks grow in a linear or dendritic fashion and in which linear features are the determinants of subsequent population movements and locations.

The Sassanian case also provides a good example of the way in which the data for mapmaking are carefully selected by the cartographer. In AD 283, the Sassanian capital city of Ctesiphon was captured by the Byzantines, but this event is never depicted on maps of the empire since it occurred after the period of time in which the empire is considered by historians and archaeologists to have been well established. Since an empire without a

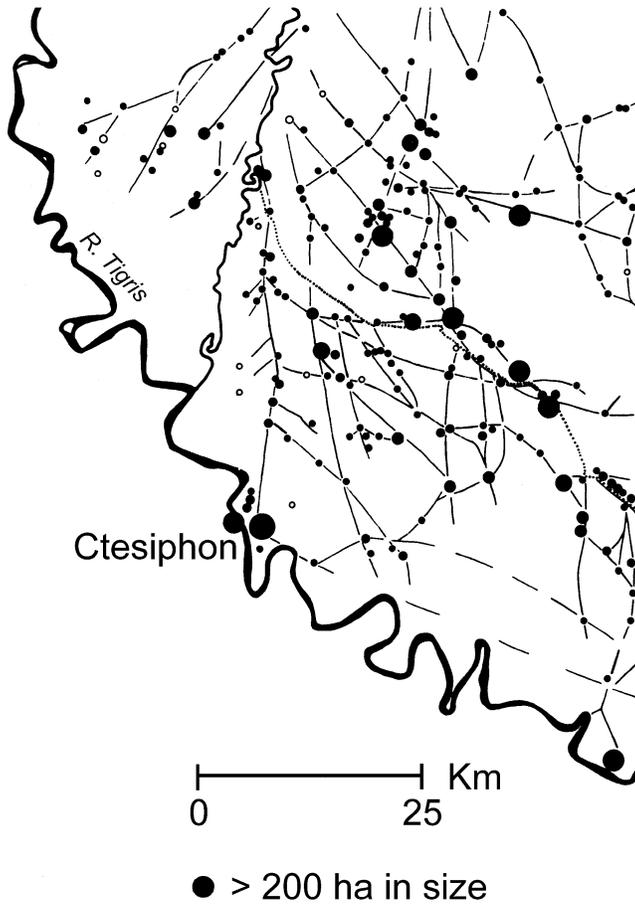


Figure 6. Sassanian settlements and canals in the area of their capital Ctesiphon in south-central Iraq (adapted from Adams 1981, 212).

center is an oxymoron, the mapmaker presents a reassuring whole instead of the disconcerting sight of a large gap in the very center of imperial territory. This pattern of holism is a misleading depiction for cases where the control of domains was much more fluid and in which even central zones were subject to loss and reclamation. Zones on the “edges” of state control were particularly subject to competing influences; for example, cities such as Nisibis were linked to various imperial domains but also sustained active networks with other groups even when the city was “captured” into one of the rival Byzantine or Sassanian empires (see Figure 5).

The Mauryan Polity

The Mauryan dynasty of the Indian subcontinent in the third and second centuries BC was a political configuration that has been described alternately as a state (Sinopoli 2001) or empire (Prasad 1977, 29; Fussman 1987–88; Chakrabarti 1992; Deloche 1992, 95; Allchin

1995; Wolpert 1997; Sugandhi 2003). Based in the Gangetic plains and with a capital city at Pataliputra (modern Patna), the Mauryans were initially one of the many small political dynasties of the Early Historic period whose development occurred in an era that also saw the initial growth of urban centers, coinage, and writing, along with Buddhism. Inscriptions found on rocks and on human-made stone pillars indicate that one of the Mauryan leaders, King Asoka, was particularly successful in welding Buddhism to political philosophy.

In these inscriptions, Asoka exhorted his subjects to refrain from killing animals, to abstain from wasteful festivals, and to be obedient to elders. The king enumerated both his pious and his practical acts of leadership, noting that among other achievements, “along the roads wells have been dug and trees planted for the use of men and beasts” (Thapar 1997, 251). The inscriptions are distributed throughout the northern portion of the Indian subcontinent, with exemplars in the far west at Kandahar (in present day Afghanistan) and a cluster in south-central India. The distribution of these inscriptions has led to the suggestion that the boundaries of “empire” can be drawn on maps based on the distribution of Asokan-attributed edicts (e.g., Fussman 1987–88, 44; Wolpert 1997, 61; Figure 7).

Because of the presence of inscriptions and other textual sources broadly dated to the Early Historic period, scholars have proposed that the Mauryan empire had a strong and centralized bureaucracy (see Fussman 1987–88; Thapar 1997). The historical impact of Asoka as a religious leader, to whom substantial donations and Buddhist support have been attributed, has further

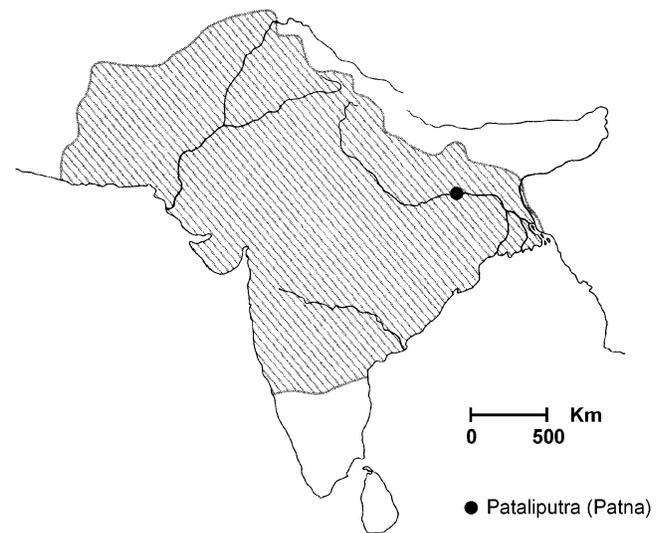


Figure 7. The Mauryan polity’s territorial extent as based on locations of Asokan inscriptions (adapted from Wolpert 1997, 64).

solidified the idea of a large, uniform, and unbroken Mauryan polity. But the Mauryan dynasty experienced a rapid decline after Asoka, and came to a definitive end in 185 BC with defeat at the hands of a rival dynast, Pushyamitra Sunga. The apparent easy fragmentation of the Mauryans after Asoka and the lack of any large unifying polities in the subcontinent until nearly 500 years later with the rise of the Guptas suggest that the Mauryan polity's construction of control was relatively ephemeral. Local inheritors of power did not seem to have reconstituted the territorial hold presumed to have been exercised by the Mauryans, and the tradition of inscriptions devolved from the continental scale associated with Asoka to instead commemorate local rulers' donations to regional Buddhist shrines and monastic communities.

The level of documented state-level investment in infrastructure under the Mauryans is minimal. Aside from the way stations mentioned in Asokan inscriptions, they constructed no formal road systems or communications networks. Investment in specific cities is unrecorded, although excavations at Patna have revealed substantial structures and a long wooden palisade that may date to the early centuries BC (summarized in Allchin 1995). In general, archaeological remains are at odds with the textual record about the manner, extent, and effectiveness of state-level control and bureaucracy. Sinopoli (2001, 159) and others have therefore proposed that the view of a strong, centrist Mauryan polity be reevaluated since "claims for its universal status and highly centralized political structure appear to have been overstated" (see also Sugandhi 2003).

A network model can generate a more robust view of how a polity such as the Mauryans may have functioned in the absence of a strongly centralized bureaucracy or concomitant landscape modifications. Using the location of inscriptions as a proxy for loci of investment, we can evaluate each location as a node connected to other nodes. While the ultimate level of connectivity would be for each point to be connected with each other point, the realities of traversing thousands of kilometers of difficult and variable terrain mean that a parsimonious series of connections would have been more likely. Following Crampton's (2001) view of cartography as an analytic method, the resulting "map" of the Mauryan polity can be drawn in a variety of different ways based on different levels of connectivity, with implications for the understanding of the polity's overall impact in the political landscape.

Two different scenarios merit further examination. In Figure 8, the area of the eastern subcontinent can be linked in a variety of ways. Duplication of parallel routes

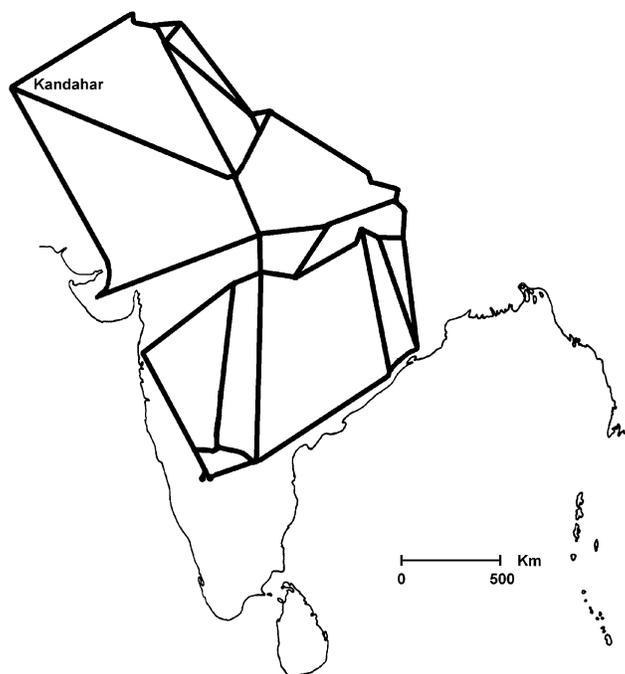


Figure 8. Connections of Asokan inscriptions showing multiple links suggestive of a strongly integrated state structure (location of inscriptions based on Allchin and Norman 1985; Thapar 1997).

implies that this more densely urbanized area sustained more robust links; in addition, the greater number of connections indicates that if one link were to be rendered unusable (due to the seasonal monsoon, for example, or warfare), an easily substituted route would be available. In Figure 9, a different set of implied connections can be explored. The dense concentration of eleven inscriptions in the far southern subcontinent has been the subject of intense scrutiny because of the distance from the Mauryans' capital in the Ganges Valley. As Kulke and Rothermund (1998, 65–66) have noted, there is a regional pattern to the distribution of the inscriptions as well as an "empty" space in the vast central region of the subcontinent in which no inscriptions have been found. Differential displays of the connections between these far southern inscriptions suggest a variety of ways of evaluating their significance. Each-to-each links between those southern points would suppose that this region was very well connected with itself and not so well connected with the Ganges region. This may either imply a split Mauryan polity; a segmentary state (cf. Southall 1988); a colonized locale; works by a successor of Asoka (Thapar 1997, 274); or, as I have suggested elsewhere (M. L. Smith 2001, 17), evidence for competitive emulation in which southern sites were not politically linked to the Ganges plain but may have shared social, ritual, or cultural ties.¹

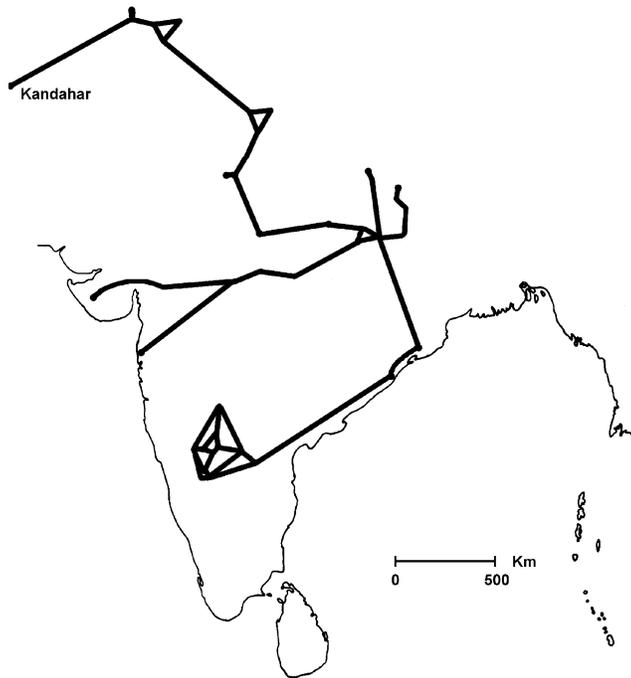


Figure 9. Connections of Asokan inscriptions showing multiple links suggestive of a streamlined and linear state structure with a detached southern concentration (locations of inscriptions based on Allchin and Norman 1985; Thapar 1997).

Discussion

Networks and boundaries are both important components of human social systems, including the largest political configurations of states and empires. A network, or node-and-connector, model illustrates the efficiency of state control via strategic investment in population centers and resource zones. The acquisition of nodes can be achieved through alliances or conquest, with subsequent connections made through natural connectors such as waterways or by purpose-built links such as roads. The flexibility with which nodes become interconnected, as well as an acknowledgment of nodal autonomy and alliance manipulation, should lead to fundamental changes in our understanding of ancient states and empires. With limited resources to expend, central authorities assembling an initial state-level bureaucratic apparatus should have been particularly focused on the efficient use of nodes as places of investment that could be linked through cost-effective corridors of transport and communication.

Network systems are highly flexible, enabling nodes to be connected in a variety of ways to move people, goods, and ideas from place to place. A network model with complete connectivity would be one in which each point is connected to each other point. In practice, however, humans engage in a hierarchy of network access.

Network analysis in the social sciences and humanities is now moving into more sophisticated treatments, in which the relative strength of ties, rather than their mere existence, is analyzed and shows the way in which networks are multidimensional and situational (Dodds, Muhamad, and Watts 2003; Granovetter 2003). Similarly, available historical and archaeological evidence illustrates that there is variability in nodes; for example, a site might have ritual importance without being the seat of political power or be the source of important crafts without having ceremonial or social significance (Marcus and Feinman 1998, 11). An economic view of nodal relationships in an ancient state would show that smaller centers such as towns and villages tend to be connected in two directions: upward in the hierarchy to larger-order centers such as cities and laterally with other nearby population centers of the same size (cf. Christaller 1966; C. A. Smith 1976a, b; Haggett 1977). Maps illustrating different functions might show different places as higher-order nodes based on economic, social, ritual, political, or resource-extraction criteria.

Although the exact contemporaneity of nodes in an ancient network may be difficult to specify with historical and archaeological data, the idea of situational and flexible control of networks as a guiding strategy for ancient states provides an impetus for better chronological control in the future, and the creation of models in which multiple situations can be tested as hypotheses for further research. While the ability to stage multiple iterations based on user-defined conditions will be a powerful challenge to mapping and other graphic demonstrations, there are tremendous opportunities to develop multidimensional models that capture the complexities of state formation and maintenance. One additional benefit beyond a more accurate conceptualization of state landscapes is the ability to project nonterritorial states that may have been present in the ancient world and which do not have modern analogues. Linear states would include the Phoenicians around the Mediterranean, who used Iron Age shipping technology to facilitate quick links across the water (Niemeyer 2000; Aubet 2001). Similarly, the Nile River provided a long ribbon of contact by which local chieftains acquired redistributed resources in a pattern later adopted by the unifying Pharaonic rulers (Hassan 1993). Purely nodal states can also be envisioned, including the nomadic dynasties of Eastern Africa (Tronvoll 1999) and the successive empires of Central Asia (Manz 2003), which exercised considerable political, economic, and social power but without a great deal of territorial management or investment.

At the same time, boundaries are a strong feature of human cognition, providing a “container” for social

action. The perception of territorial boundaries effects internal restructuring as well as external recognition, but such boundaries may in practice have been “fuzzy” rather than fixed (cf. Zadeh 1965; Wang and Hall 1996; Dubois, Ostasiewicz, and Prade 2000; Reilly 2003, 9). One potential additional function of new analyses may be to downplay warfare and its importance in the creation and maintenance of ancient states. The textual record of warfare concerns the takeover of unwilling nodes and the construction of formal barriers, activities that have recently become of increased interest to social scientists (e.g., Archer et al. 2002) and to archaeologists in particular (e.g., Gilchrist 2003; Plog 2003). Such activities may have entered the historical record disproportionately to the frequency of their occurrence, however, making our view of premodern states inherently combative when the reality of cooperation and alliances may have more closely characterized ancient polities. The relatively high cost of warfare involves preparation for combat as well as the risk of loss and of an unknown outcome. In contrast, investments of alliance and strategic cooption may involve similar levels of initial effort but with a payoff that involves less long-term risk. Successful leaders of ancient states may have avoided setting boundaries at all lest they serve as a touchstone for conflict; when they did expend resources on boundaries, those limits were likely to have been highly selective and strategically located, as they were in the Sassanian case.

Conclusion

Historical and archaeological data illustrate that ancient states and empires are more effectively depicted and understood as networks rather than as homogenous territorial entities. Maps that illustrate variances in state-level activity can provide a more comprehensive and accurate view of the ways in which political entities manage their resources and respond to competition. Perhaps the only disadvantage to such redrawings is that the number of maps will increase dramatically, a factor of graphics that could prove to be a serious impediment in traditionally published sources and when graphics professionals are in short supply. In political terms, there also may be some resistance to new maps based on networks because they do not provide the clean lines for ancient polities that often are used to support today’s state-level ambitions (see, e.g., Rowlands 1994; Diener 2002).

Mappers of ancient polities face a double challenge to cartography: premodern states and empires were behaviorally more complex than a simple territorial outline

would imply, yet the improvement of those maps is conditioned by the inherent limitations of archaeological and historical information. Nonetheless, maps will continue to play a strong role in modeling the actions of ancient political entities; while geographers could well become “mapphobic” (cf. Perkins 2003) without disabling their discipline, archaeologists will always need maps to record the locations of sites and artifacts. Although the limitations of chronology will continue to affect the time length of the intervals that can be mapped, new technologies may provide the mechanism for visualizing the development of ancient states, just as they have for the development of modern states (for examples of the latter, see Mamadouh 2003, 673). Given our understanding that even modern states have conditional boundaries with differential impacts both within and beyond their borders, we need to recognize that territorial maps of ancient states are an idealized projection of state authority rather than a depiction of the way in which ancient political domains were actually governed. Simple territorial maps on the basis of site locations or artifact distributions obscure the multilayered processes of contact, interaction, domination, resistance, and tenuous integration that characterized premodern political systems. Even when absolute boundaries can be precisely defined and delineated, the presence of numerous competing claims may make state boundaries porous and meaningless. Mapping the multi-component processes of authority upon a social landscape instead requires the enactment of new cartographic strategies that recognize the situational, flexible, and changeable nature of state-level systems.

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Notes

1. Indications of possible local copying efforts can be found in the way that the edicts are written. For example, Allchin and Norman (1985, 46) describe one of the Afghanistan

stone-slab inscriptions as having “what seem to be quotations from Asokan edicts in Prakrit (written in Aramaic script) with Aramaic paraphrases.”

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