



Property, Identity, and Macroeconomy in the Prehispanic Southwest

ABSTRACT Archaeology provides a compelling perspective on the evolution of property rights and macroeconomy in precapitalist societies that lacked systems of writing. Most interpretations of macroeconomy in the Prehispanic Southwest have focused on interaction networks that emanated from “heartlands” where intensive agriculturalists were aggregated in towns along major streams. Although archaeologists are aware of communities in “hinterland” territories, they rarely consider their political economies. As a remedy, we apply common-pool-resource (CPR) theory to investigate hypothesized linkages between property rights and social identity in two hinterlands in Arizona: the Papagueria and the Grand Canyon. Our analyses indicate, first, that from circa C.E. 850 to C.E. 1350, local communities negotiated their social identities in a macroeconomy of fluctuating resource values and, second, that incentives for privatizing peripheral territories intensified in some areas during periods of economic competition. These findings underscore the critical role of archaeology in modeling property rights in precapitalist societies. [Keywords: common-pool resources, archaeology, Native America, political economy, regional analysis]

ANTHROPOLOGICAL ARCHAEOLOGY is uniquely positioned to study the origin and development of property in precapitalist societies that lacked systems of writing or other textual data (Earle 2000; Gilman 1998). The overwhelming majority of traditional societies that ethnographers have documented were only observed after industrial capitalism had already penetrated and influenced all but the most isolated reaches of the world. Therein lies the strength of archaeology and its study of ancient economies. Ancient societies in the Prehispanic Southwest (hereafter, “Southwest”), for example, predated the introduction of capitalism that followed the arrival of Spanish explorers, military personnel, and missionaries in the mid-16th century. The region harbored an expansive patchwork of different societies and cultural traditions, included a rich mosaic of environmental settings, and has been documented by archaeologists in great detail for over a century. Consequently, the region offers an unsurpassed opportunity to examine the economic conditions that underlay the emergence of property in precapitalist societies.

Archaeological interpretations of macroeconomy in the Southwest have broadly focused on delineating the geographic domains of interaction among its farming societies and on inferring their sociopolitical structure before

Spanish contact in C.E. 1540 (e.g., Lekson 1999; McGuire et al. 1994; Upham 2000; Wilcox 1999; Figure 1). Such models emphasize monumental architecture and prestige goods as hallmarks of regional interaction spheres that incorporated aggregated towns and villages (e.g., Crown and Judge 1991). Archaeologists now commonly employ a macroscale of analysis in archaeology of the Southwest, and use of this scale has greatly strengthened research in the region (Hegmon 2000).

With a few notable exceptions (e.g., Tainter and Plog 1994; Upham 1992), however, archaeologists of the Southwest have rarely addressed the roles of outlying “hinterland” territories (or so-called “peripheries”) until quite recently (e.g., Sullivan and Bayman 2007).¹ By definition, hinterlands generally lacked large concentrated populations and communities, but they were significant in the economies of ancient societies; they often contained raw materials for craft production, consumable food resources, and arable land. Interestingly, a considerable proportion of the entire population in the Southwest was never fully integrated into any particular regional (“heartland”) system. Yet theoretically informed models for describing and explaining their internal operation in the Southwest are rare and consist largely of variations of world systems theory as it was

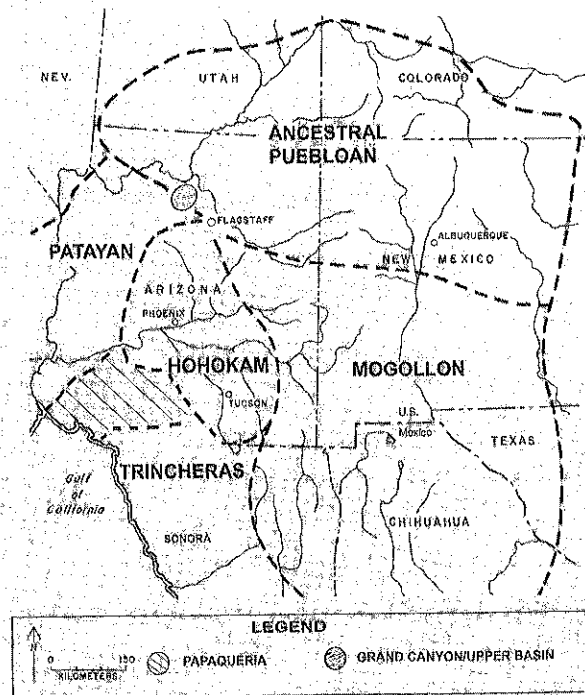


FIGURE 1. Location of Papageria and Grand Canyon–Upper Basin in the Southwest. (Map prepared by Ronald Beckwith and Alex Morrison)

originally construed by Immanuel Wallerstein (1974, 1980) and others (e.g., Frank and Gills 1993). The substantive findings of archaeology in the Southwest (e.g., McGuire 1991; Whittlesey 2007) and elsewhere (e.g., Jennings 2006; Peregrine and Feinman 1996) challenge such applications (e.g., Pailles and Whitecotton 1979).

Thus, we argue that common-pool-resource (CPR) theory offers a valuable heuristic strategy for studying the economic construction of property rights and social identity in the archaeological record, and we use the Southwest as an illustration. Two hinterland territories, occupied between C.E. 850 and C.E. 1350, provide our cases: the Papageria in the southern desert Southwest and the Grand Canyon–Upper Basin in the northern upland Southwest (Figure 1). These two locales differ substantially in their archaeological and environmental histories, and yet for several centuries both territories were loci of resource extraction and economic production by a plurality of populations. Our comparative analysis indicates that CPR systems enabled multiple social groups to access resources in the Papageria and the southern rim of the Grand Canyon, at least until C.E. 1200. After C.E. 1200, however, increasing demand for resources in the Papageria, in the face of changing environmental conditions in the greater Southwest, offered a powerful incentive for populations in neighboring heartlands (i.e., Hohokam and Trincheras) to establish exclusionary rights to territorial property beyond their borders. Interpolity competition for resources in the Papageria, such as arable land and raw materials (i.e., marine shell

and obsidian) for prestige goods, signaled the demise of the CPR system. In contrast, both local and nonlocal populations continued to use resources in the Upper Basin, on the southern rim of the Grand Canyon, in a more collective (“commons” or nonterritorialized) fashion that is typical of a CPR system of economic organization.

Before summarizing our supporting evidence, we define the concept of “property” and outline the major tenets of CPR theory as it has been applied by social scientists (e.g., Agrawal 2003; Feeny et al. 1990; Ostrom 1990) and by archaeologists (e.g., Adler 1996; Eerkens 1999; Kimball 2006; Kohler 1992; Serjeanston 2001). Through this discussion, we emphasize the importance of archaeological data for understanding the evolution of property rights in precapitalist societies.

CONCEPTUALIZING PROPERTY

Property determines exclusive rights to resources, and an analytical distinction is often drawn between “landed” property and “moveable” property (Earle 2000).² Landed property is immobile and people must move to it; it can, however, be improved by social labor (Earle 2000:40). Moveable property is fabricated by people, and its circulation may require elements of alienation, rights of transfer, and ownership (Hunt 1998), although this point is qualified in some models of noncapitalist economies (e.g., Mills 2004; Weiner 1992). Payment of debt and damages, theft, gifting, and trade are only a few of many mechanisms that may underlie the movement and transfer of property.

Archaeological signatures of property rights may include evidence for investment in the improvement of cultural objects, participation in warfare to “alienate” or defend property, the occupation and settlement of territories (e.g., Kohler 1992), and the marking of land and objects (Earle 1998:96–97; Gilman 1998; cf. Johnston 2005, and Jones 2005). Marking of land may be accomplished through various forms of capital investment, including the installation of agricultural facilities (e.g., Adler 1996:362–363; Sullivan and Downum 1991) and the construction of burial and nonburial monuments (e.g., Arnold and Murray 2002). The marking of objects can be accomplished with the use of seals or maker’s marks (e.g., Windes 1984), the execution of certain decorative styles, and other practices (e.g., Aarts 2005; Wobst 1977). Although property rights do leave tangible traces in the archaeological record, they are not unambiguous, and identifying the economic factors that underlie the origin and development of ancient property rights is a formidable but worthy inferential challenge for archaeologists (Gilman 1998:227–228). We argue that CPR theory offers a promising approach.

COMMON-POOL-RESOURCE (CPR) THEORY

CPR theory is a relatively well-developed approach in economic anthropology (e.g., Ostrom 1990; Smith and Wishnie 2000) and offers an explanatory framework for the evolution of property in precapitalist societies.³ With

some notable exceptions (e.g., Kohler 1992), however, its interpretive potential for archaeology has not been widely explored except in the case of foraging economies (e.g., Eerkens 1999; Kimball 2006; Serjeanston 2001). Briefly, a CPR is a "natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use" (Ostrom 1990:30). Examples of CPRs include (but are not limited to) oceanic and lacustrine fishing grounds, terrestrial foraging domains like forests and mountains, and potable waters like lakes and aquifers. CPRs are used by multiple populations, such as individuals, families, tribes, or larger-scale societies, who may harvest resources without gaining prior permission but adhere to agreed-on rules that all joint users understand (Eerkens 1999:298).

Theories for the emergence of such joint-use territories are generally tied to considerations such as environmental buffering, reducing social conflict, and the costs and benefits of defending a territory (Dyson-Hudson and Smith 1978; Eerkens 1999:307). Although ecological and geographic factors are fundamental to the development of CPR systems (Cashdan 2001), history and politics are no less significant. Political-economic incentives, climatic variability, and demographic pressure offer a suite of advantages and drawbacks to groups who might seek to colonize or acquire resources from such territories (Dean 1996).

In some contexts, the emergence of social institutions that underwrite the privatization of territory and resources, such as certain types of land tenure, is likely to eclipse collective action in a CPR system (e.g., Jones 2005). De facto privatization of territory is expected (but not always required) in preindustrial societies with intensified agriculture because such systems often required high degrees of capital investment (Adler 1996:364–365; Earle 2000:46–47). In contrast, hinterland areas in the Southwest that were inappropriate for intensified agriculture (e.g., the Papageria and Grand Canyon) were initially more suited to collective institutions of resource use; they thus can be investigated with CPR theory. We briefly review general environmental parameters of the Southwest before we apply the CPR perspective to our two cases and outline our specific hypotheses and archaeological expectations.

GEOGRAPHIC CONTEXT AND ARCHAEOLOGICAL CONSIDERATIONS

Ancient societies in the Southwest practiced broad-spectrum subsistence economies that included a mix of agricultural production and terrestrial foraging. Some communities in Southwest societies with high populations (e.g., Hohokam) resided in towns and villages along large perennial drainage systems. Some areas were riskier for agricultural production (esp. the northern Southwest) because precipitation was often erratic and marginally sufficient for dry farming (e.g., Dean 1996). This problem was especially acute in nonriverine areas, and many archaeologists have argued that ancient communities used buffering strategies (e.g., res-

idential mobility, exchange, and food storage) to manage the risks associated with year-to-year variability in rainfall (e.g., Halstead and O'Shea 1989). These strategies were likely common among Southwest populations who lived in hinterland regions away from perennial drainages.

We compare two hinterland areas: the Papageria in the southern Southwest and the Grand Canyon–Upper Basin of the Colorado Plateau, circa C.E. 850 to C.E. 1350 (Figure 1). This time frame of our comparison was characterized by macroregional shifts in economic and sociopolitical organization of both hinterlands and heartlands (Cordell 1997:305–340). Studies of environmental change and demography in the greater Southwest confirm that climatic conditions that were favorable for agriculture generally correlated with relatively high levels of human population between C.E. 550 and C.E. 1200 (e.g., Hill et al. 2004). A precipitous decline in macroregional population after C.E. 1200 may be related to climatic conditions that elevated the risks of agriculturally dependent economies in some heartland areas (Graybill et al. 2006).

Sporadic precipitation and a lack of perennial streams made the Grand Canyon–Upper Basin inappropriate for intensive agriculture that characterized the heartlands. Following the tenets of CRP theory, hinterland populations would have limited their investment in the region to the encouragement and extraction of wild economic plant foods (like pinyon nuts and amaranth) and may have done so through collective procurement (Sullivan and Ruter 2006). By contrast, groups using the Papageria accessed both wild foods (e.g., cactus fruit) and raw materials (e.g., marine shell and obsidian) needed to manufacture prestige goods that were vital to social reproduction across the Southwest (Bayman 2002). Some nonriverine locales in the Papageria also provided opportunities for nonintensive agriculture. Accordingly, we expect that privatization of property (and demise of the CPR system) occurred in the Papageria after C.E. 1200, as the value of its land and resources rose dramatically in the face of increased economic competition. This competition was likely driven by a suite of political and environmental factors, including interpolity rivalries and vicissitudes in climate. Below, we outline dominant ecological characteristics, general patterns of subsistence and settlement, and ceramic craft economy in each area (i.e., Papageria and Grand Canyon–Upper Basin) to provide a context for our application of the CPR model (*sensu* Eerkens 1999; Ostrom 1990). We review this archaeological and environmental information to determine whether our case studies meet the expectations of CPR theory and whether exclusionary property rights emerged in one or both areas.

THE PAPAGERIA OF THE SOUTHERN SOUTHWEST

Environmental Context

The Papageria includes the gulf coast of Adair Bay in Sonora, Mexico, and lies south of the lower Gila River, east of the lower Colorado River, and west of the Tucson Basin (Figure 1). The region is a basin-and-range environment



FIGURE 2. Quitobaquito Spring in south-central Papagueria. (Photo courtesy of G. Donald Bain/The Geo-Images Project, University of California-Berkeley)

with wide alluvial valleys that are divided by north-to-south trending mountain ranges with elevations as high as 2,356 meters above sea level. The region exhibits an ecological gradient, wherein precipitation and floral and faunal densities diminish westward to the lower Colorado River (Hackenberg 1961). Perennial streams are absent, but a few springs (Figure 2) and drainages along mountain flanks capture seasonal runoff that could be diverted to fields with cultigens. Ephemeral water holes are also scattered across the Papagueria (Broyles 1996).

Economic plants include fruit-bearing cacti (e.g., saguaro, prickly pear, and cholla) and seed- and fuel wood-bearing trees such as mesquite, ironwood, and paloverde (Figure 3). Animal protein was relatively abundant and included rabbits, rodents, coyote, birds, reptiles and amphibians, deer, and bighorn sheep. Nonedible resources in the Papagueria include numerous outcrops of tool-quality stone, like obsidian (Bayman and Shackley 1999), and coastal marine shell for making ornaments and ritual paraphernalia, such as trumpets (Bayman 2002; Hayden 1972; McGuire and Howard 1987).

Papaguerian Subsistence and Settlement

Sustained foraging and horticultural production in the Papagueria prior to C.E. 1200 is represented by abundant scatters of ceramics, ground stone, and chipped stone tools,

along with fire-cracked-rock features (e.g., Doelle 1980). Rock features in upland settings are commonly associated with burned deer and bighorn sheep bones, bifacial tools, and carbonized plant remains (e.g., Lyon and Holloway 2000). At least two archaeological sites (Verbena Village and Lost City) in western Papagueria (the driest locale in the broader region) exceed 640 acres in area (Olszewski et al. 1996:79–93). These vast locales likely represent a palimpsest of extraction loci and residential habitation from multiple periods. Intensive excavations have not yet been undertaken at these two areas, but surface artifacts on these sites include ground stone along with ceramics from bowls and jars, reflecting food preparation, consumption, and storage (Lascaux and Tucker 2000). These and other similar site complexes are also covered with debris from marine-shell ornament production (Bayman 2007).⁴

Western Papagueria is a high-risk environment for traditional horticulture and agriculture, given its highly limited precipitation (i.e., less than six inches annually). Surprisingly, evidence of food production and consumption includes the discovery of maize pollen aggregates, phytoliths, and burned cob cupules in two pithouses at the Mobak site (Hill and Bruder 2000:17–10–17–11). Together, these data indicate that populations processed and stored fresh corn at this interior desert settlement. Geomorphic evidence of stream-channel modification suggests that some ancient communities in western Papagueria also dredged



FIGURE 3. Saguaro cactus forest on mountain slope in eastern Papagueria. (Photo ©Adriel Heisey 2007, <http://www.adrielheisey.com>)

tributaries of large washes to divert water to their desert fields (Pearthree et al. 2000). Clearly, local residents or seasonal visitors to the Papagueria practiced incipient economic intensification.

Papaguerian Ceramics and Social Identity

Inferring social identity in the archaeological record entails an unavoidable measure of ambiguity (Jones 1997). For heuristic purposes, however, we assume that variation among ceramic assemblages from different geographic locales materialized alternative traditions (sensu Pauketat 2001) of cultural production.⁵ Traditions may be created at multiple scales and relate to a variety of cultural entities including (but not limited to) cultures, communities, kinship groups, political factions, or ethnic populations (Lightfoot 2001:243). Notably, three well-established archaeological traditions surrounded the Papagueria: the Trincheras, Patayan, and Hohokam. Although groups living in each tradition's heartland emphasized agricultural production, their craft economies, architectural styles, and ideologies differed markedly (Cordell 1997).

Each of these three traditions is represented in the Papagueria before C.E. 1200, although monumental architecture forms—such as ball-courts and platform mounds indicative of Hohokam and hillside *trincheras* (i.e., mas-

sive stone terraces and alignments) indicative of Trincheras (McGuire and Villalpando 1993)—were largely absent until after C.E. 1200.⁶ The lack of monumental architecture and dearth of cemeteries in much of the Papagueria before C.E. 1200 implies that members of these three traditions did not assert exclusionary property rights (sensu Earle 2000) or that surrounding populations used this area relatively lightly before C.E. 1200. Stylistic differences in rock art may also reflect the demarcation of territory (e.g., Bostwick 2002:222–223) by Trincheras, Patayan, and Hohokam populations, but integrative studies of the regions' iconography have not been conducted.

Previous studies of ceramic distributions in the Papagueria once suggested that a clear boundary could be discerned between the Patayan and Hohokam traditions before C.E. 1200 (e.g., Ezell 1955), but more recent findings have clouded their geographic separation. Some archaeologists claim that surface ceramic assemblages in contemporaneous locales of western Papagueria have roughly equivalent proportions of Patayan and Hohokam ceramics (e.g., Lascaux and Tucker 2000:311; Lyon and Gregonis 2000:662–663). Similarly, historic-period assemblages in the region disclose a blend of vessel shapes and decorative styles from the Yuman and Tohono O'odham traditions, the presumed descendants of ancient Patayan and Hohokam populations (Gregonis 2000:473). Cultural syncretism of this sort increases the difficulty of identifying sharp technological and stylistic boundaries (Jones 1997; Stark 2006) between the Patayan and Hohokam traditions. Bilingualism among historic descendants of these ancient populations (in the most arid area of the Sonoran Desert) further underscores the fluidity of economic relations in the Papagueria (Hill 2004:131–136).

Thus, it is possible that participants in the Patayan and Hohokam traditions met at these locales to exchange information, such as the whereabouts of water sources, and to trade commodities, such as ceramics (e.g., Lascaux and Tucker 2000:317) and obsidian (Bayman and Shackley 1999). Unfortunately, archaeological by-products of such interaction are difficult to distinguish from alternative forms of economic behavior. For example, members from different traditions could have visited and extracted resources from the same localities but at different times of the year (Beck and Neff 2007). Alternatively, members from different traditions could have visited the same general areas but occupied separate sites, a well-documented pattern in the vicinity of Organ Pipe Cactus National Monument (Ezell 1955). Finally, local populations could have resided in the Papagueria on a year-round basis and have imported some (if not all) of their ceramics from surrounding traditions (i.e., Trincheras, Patayan, Hohokam).

Discussion

Because archaeological information to resolve the nature of settlement in central and western Papagueria is insufficient pending further fieldwork, direct historic analogy offers a

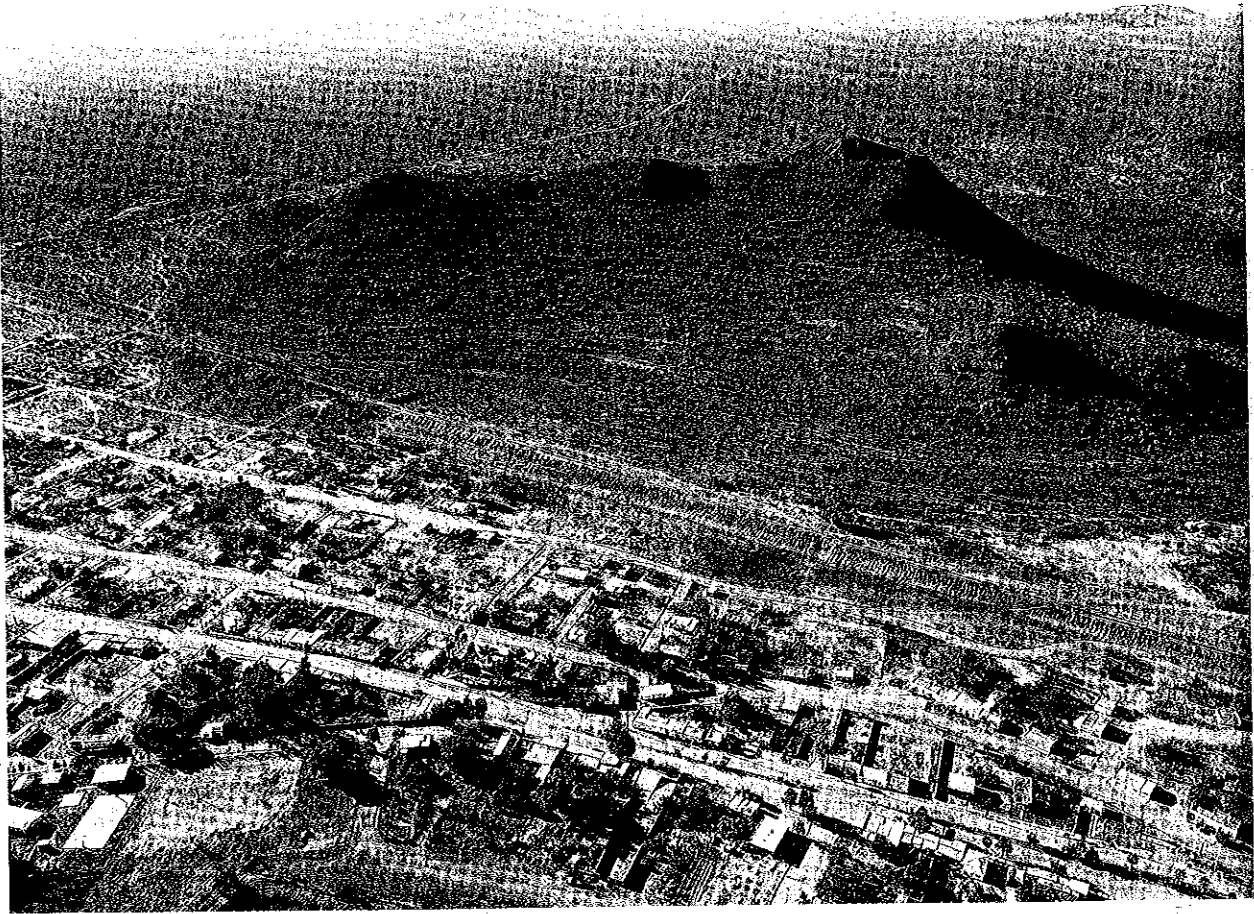


FIGURE 4. Ancient site of Cerro de Trincheras and present-day town of Trincheras, Sonora, Mexico. (Photo ©Adriel Heisey 2007, <http://www.adrielheisey.com>)

provisional means of evaluating alternative scenarios. Archaeologists have invoked ethnographies of historic-period Tohono O'odham Indians (e.g., Castetter and Bell 1942) to infer that some ancient Papaguerian communities practiced a "two-village" residence pattern (e.g., Masse 1980). During the early 20th century, Tohono O'odham populations resided in small agricultural hamlets along washes in summer, when seasonal precipitation could be diverted to fields with cultigens such as corn, beans, and squash. After crops were harvested in late autumn, communities located to upland encampments until spring (Castetter and Bell 1942). During winter they consumed their agricultural reserves and foraged for animal protein and other sources of nutrition (Bohrer 1970:424). If this ethnographic pattern reflects prehistory, occupations in the Papageria before C.E. 1200 were likely episodic, repeated, and entailed multiple populations who (more or less) operated with at least a tacit agreement to share the region's resources as an "open access" or CPR system. The archaeological record suggests, however, that if an open access or common-pool system actually ever existed, it eventually ended.

The appearance of terraced hilltops (Trincheras) and platform mounds (Hohokam) in southeastern Papageria after C.E. 1200 (Fish and Fish 1994) implies the unraveling of collective principles of open access to the region's resources (e.g., plant resources, shell, obsidian; Figure 4). Members of Hohokam and Trincheras (Figure 4) society likely used their respective forms of monumental architecture to establish exclusionary use privileges, as a prelude to claiming "ownership." If monuments did nonverbally signal (sensu Rapoport 1990) restricted or controlled land use in the Southwest (Stone and Downum 1999:119–121), it appears that the Papageria was no longer an "open access" or CPR system. Newly constructed and visually imposing platform mounds and hilltop trincheras would have materialized rights to territory (e.g., Fish and Fish 2000) that arose as a consequence of competition for land and resources among practitioners of the Patayan, Hohokam, and Trincheras traditions.

It is plausible, as well, that some local communities in the Papageria sought to emulate the "technological style" (sensu Dietler and Herbich 1998) of the Hohokam ceramic tradition to ally themselves with what appeared



FIGURE 5. Hohokam Great House at Casa Grande on the southern margin of the greater Phoenix Basin. (Photo ©Adriel Heisey 2007, <http://www.adrielheisey.com>)

to be a powerful social bloc in the greater Phoenix Basin (Figure 5). Occupants of this hinterland area could have adopted platform mounds and their associated worldview to establish and strengthen their affiliation with Hohokam society.

In either case, after C.E. 1300, sociopolitical machinations within the Phoenix Basin Hohokam surely escalated in the face of demographic pressure, as did challenges of managing irregularities in stream flow that fed extensive irrigation systems. In addition, the reduction of mesquite forests for fuel and construction material not only made wood an increasingly scarce and valuable commodity but aggravated erosion of arable land (Redman 1999:151). Together, these problems elevated the market value of such resources in the Papagueria and attracted populations from surrounding territories, even during the subsequent protohistoric and historic periods. Thus, it is not surprising that Classic-period Hohokam established a residential settlement with a water storage reservoir in the Organ Pipe National Monument area (Bayman et al. 2004) to procure and export nonlocal resources (like marine shell, obsidian, and plant resources) directly to the Phoenix Basin heartland (McGuire and Howard 1987).

Notably, increasing competition for scarce resources in the prehispanic period foreshadowed challenging economic conditions of subsequent centuries. In the 19th century, for example, Piman communities in the Phoenix area traveled downstream to northern Papagueria to gather



FIGURE 6. Inner Gorge of Grand Canyon. (Photo ©Adriel Heisey 2007, <http://www.adrielheisey.com>)

saguaro (Russell 1908). In another instance, a group of 200 Piman women were escorted into the Papagueria by a patrol of warriors as they gathered wood. Such escorts were necessary to ensure their safety from Apache warriors (Rice 2001). That such dangerous ventures were undertaken underscores the imperative of acquiring increasingly rare and valuable resources.

THE GRAND CANYON IN THE NORTHERN SOUTHWEST

Environmental Context

The Grand Canyon's Upper Basin, located on the Coconino Plateau in northern Arizona, offers an intriguing contrast with the Sonoran Desert (Figure 1). Terrain in the region consists of heavily dissected, southward facing slopes of exposed and eroded limestone bedrock (Carter and Sullivan 2007:145). With elevations ranging between 2,195 and 1,829 meters above sea level, the Upper Basin is considerably higher than the Inner Gorge (Figure 6) of the Grand Canyon and the Papagueria, and it has a shorter growing season. Vegetation in the Upper Basin is composed primarily of dense pinyon-juniper woodlands (Figure 7) that are interspersed with pockets of sagebrush-grasslands.

Although by some standards the region has an adequate growing season for maize (130 or more frost-free days), and although it receives almost 15 inches of precipitation a year, rain is frequently absent during late spring, early summer,



FIGURE 7. Pinyon-juniper forest in Upper Basin. (Photo by Alan P. Sullivan III)

and early autumn, which is the height of the growing season for maize (Sullivan et al. 2002). The Upper Basin, like the Papagueria, lacks perennial streams, and the intensified production of cultigens with large-scale irrigation was not a feasible economic option (Sullivan 2000). However, dense anthropogenic concentrations of wild plants (such as amaranth and grass seeds) were available seasonally in the Upper Basin, along with pinyon nuts.

Upper Basin Subsistence and Settlement

Intensive archaeological survey of the Upper Basin confirms the widespread distribution of masonry structures, fire-cracked-rock features, scatters of ceramics, and chipped stone tools, including projectile points (Uphus et al. 2006). The vast majority of masonry structures are composed of a single room, although a few structures have as many as six rooms.⁷ Excavations of tree-ring-dated masonry structures (Figure 8) indicate that they were occupied continuously for as long as a decade (Sullivan 1986; Whittlesey 1992). Although exceptionally modest amounts of burned maize and maize pollen have been recovered at Upper Basin sites, paleobotanical contents of hearths, storage pits, and broken ceramic vessels are heavily dominated by wild economic plants (Sullivan 1987; Sullivan and Ruter 2006). These findings imply that the long-standing notion that ancient land

use in and around the Grand Canyon entailed a high degree of seasonal residential mobility that was related to low-intensity agricultural production (e.g., Effland et al. 1981) is inaccurate.

The nonresidential sites with low piles of fire-cracked rock (Figure 9) are relatively abundant during all ceramic periods of occupation. Paleobotanical evidence suggests that these features were used to extract and process pinyon nuts, “weeds,” *cheno-ams* (such as “goosefoot” and “pigweed”), and other wild plant resources (Sullivan et al. 2003), as they were in the Great Basin (e.g., Eerkens et al. 2004). By roasting and drying the nuts, it was possible to preserve and store a high-calorie food resource at residential sites for up to four years (Schellbach 1933:222). Such resources were evidently important in an area of the Southwest that has so far failed to produce strong archaeological evidence for a significant degree of horticultural dependence (Sullivan 1992).

Upper Basin Ceramics and Social Identity

The Upper Basin was most heavily occupied circa C.E. 850 to C.E. 1200 (Sullivan and Ruter 2006). Two distinctive traditions—Cohonina to the west and south, and Ancestral Puebloan to the east and north—bordered the Upper Basin at this time (Figure 1). However, the social identities



FIGURE 8. Archaeological excavation of ancient house in Upper Basin. (Photo by Alan P. Sullivan III)

of its occupants are uncertain (Taylor 1958). Along these lines, petrographic analyses of San Francisco Mountain and Tusayan gray wares from Upper Basin sites indicate that temper in these ceramics does not match locally available (intrabasin) sources (Carter and Sullivan 2007). There is, nonetheless, strong evidence for on-site ceramic fabrication in the Upper Basin, including ceramic production tools, firing facilities, and firing “wasters” (Becher and Sullivan 1994).

Together, these data imply that residents of the Upper Basin made at least some of their own plain ceramic vessels using temper acquired from outside the region, most likely through direct procurement (Carter and Sullivan 2007). Although importation of raw materials in excess of seven kilometers is not common in the ethnographic world, Dean Arnold notes that “communities could have a resource area with a 25–50 km radius” (1985:58–59). Long-distance importation of ceramic materials (e.g., pigment) has been documented elsewhere in the Southwest (e.g., Huntley 2006), and the Upper Basin may offer a rare example of such behavior to acquire nonlocal temper. At any rate, ancient production of ceramics for local use is well documented in archaeology of the Southwest (e.g., Crown 1994; Kojo 1996), and so evidence of its practice in the Upper Basin and other areas with CPR systems, such as the Great Basin (Eerkens et al. 2002), is not surprising. Of course, Upper Basin res-

idents could have exchanged local resources (e.g., pinyon nuts or firewood) for nonlocal temper or finished ceramic vessels, but direct evidence of such transactions is not preserved in the archaeological record.

Discussion

Recent archaeological research confirms that residents of the Upper Basin were economically self-sustaining for more than three centuries (Sullivan 1992). Although population in the region waned after C.E. 1200, people still utilized the region, albeit less intensively (Euler 1988). Even if individual self-interested households “privatized” pinyon nut gathering and processing (see Eerkens 2004 for a relevant discussion), there is no evidence for the emergence of exclusionary behavior and a defended territory that was controlled by a community of aggregated settlements with monumental architecture. Even after perennial settlements ceased to be established in the late 12th century, the Upper Basin remained an ancillary resource-catchment for transient visitors (e.g., logistical hunters) from neighboring areas, such as the Havasupai to the west and Ancestral Pueblo peoples to the east (Schwartz 1990).

COMPARISON OF THE CASE STUDIES

The Papagueria and the Upper Basin were economically autonomous of their nearby heartland traditions for several

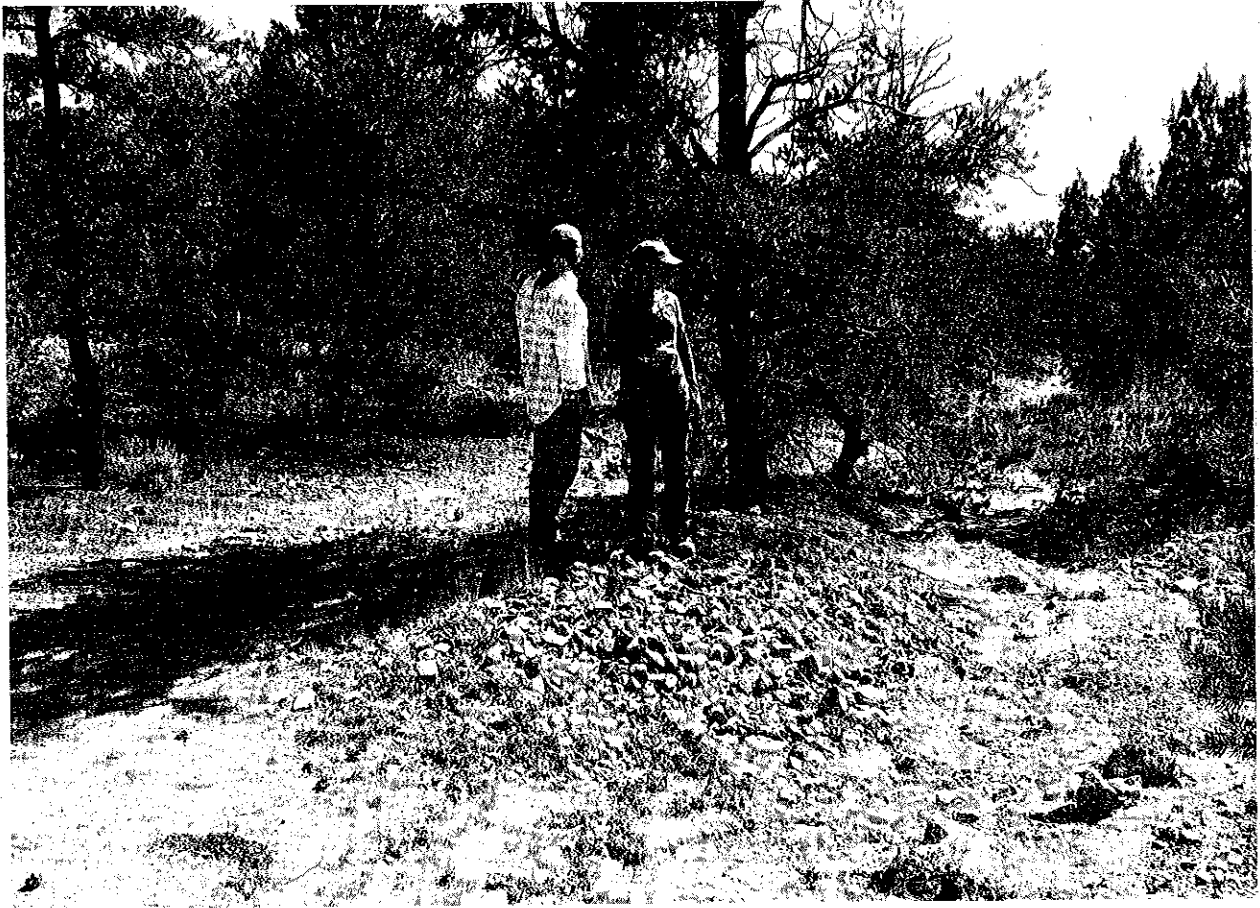


FIGURE 9. Ancient rock pile in Upper Basin. (Photo by Alan P. Sullivan III)

centuries before C.E. 1200. Occupants of both areas constructed residential settlements, engaged in broad-spectrum subsistence economies, and practiced local ceramic production (Table 1). Because populations in neither area were dependent on intensive agriculture, they (initially) had little or no incentive to establish exclusive rights to territorial property (see Adler 1996 for a relevant discussion; cf. Jones 2005; see also Stone and Downum 1999). Although it is certainly plausible that members of surrounding heartland populations visited some of these hinterland areas to extract resources (as did historic-period Pima, Havasupai, and Hopi), their interaction with local residents may have been tacitly benign and possibly even cooperative. Both areas had “open access” or CPR economies whose resources were freely used—if not formally shared—by residents and nonresidents alike. The specific social institutions that developed to govern these “open access” systems are beyond the scope of this study but should be examined in future applications of CPR theory in archaeology.

Although the Papagueria and the Upper Basin were economically similar for several centuries, these two areas sharply diverged after C.E. 1200 (Table 1). As we noted earlier, access to resources in the Papagueria was hotly contested and platform mounds and hilltop trincheras were

constructed to assert territorial property rights. Although there is no unequivocal evidence for warfare in the Papagueria or elsewhere in the Sonoran Desert (LeBlanc 1999:263; cf. Doelle and Wallace 1991:331), competition may have arisen as individuals and communities in the Papagueria opted to affiliate with (or identify themselves as members of) Hohokam and Trincheras societies by adopting their ceramic traditions and monumental architectural styles. Alternatively, heartland societies (i.e., Hohokam and Trincheras) may have outcompeted hinterland populations as they entered the Papagueria forcefully to control its people and resources. In general, small-scale CPR systems (like those in hinterlands that we describe) are vulnerable to competition from more powerful political and economic systems (Smith and Wishnie 2000:505).

In contrast, utilization of the Upper Basin and its neighboring environs waned with the onset of the 13th century, as the aggregation of populations accelerated across the greater Southwest. The fact that nonresident populations continued to exploit the Upper Basin underscores the role of this area as a “persistent place” (*sensu* Schlanger 1992) that was repeatedly visited or occupied. Persistent places were undoubtedly common in many other areas of the Southwest after C.E. 1200, but they have been overlooked by many archaeologists who emphasize sites that are endowed with

TABLE 1. Comparative Qualitative Characteristics of the Papagueria and Grand Canyon–Upper Basin.

Case study	C.E. 850–1200	C.E. 1200–1350	Selected references
Papagueria			
Subsistence & settlement	foraging (e.g., cacti & seed-bearing plants) generalized hunting horticulture (e.g., maize) dispersed settlement	foraging (e.g., cacti & seed-bearing plants) generalized & specialized logistical hunting agriculture (e.g., maize) aggregated settlement (near reservoirs and walk-in wells)	Castetter and Bell 1942 Doelle 1980 Hill and Bruder 2000 Bayman et al. 2004
Craft economy	local ceramic production export of unworked obsidian export of finished marine shell ornaments	local ceramic production export of unworked obsidian export of unworked marine shell	Beck and Neff 2007 Bayman and Shackley 1999 McGuire and Howard 1987
Monumentality	none	construction of <i>trincheras</i> & platform mounds	McGuire and Villalpando 1993 Fish and Fish 1994
Grand Canyon–Upper Basin			
Subsistence & settlement	intensive foraging (e.g., pinyon nuts) and wild plant husbandry (e.g., grasses & <i>cheno-ams</i>) generalized hunting low-intensity horticulture (e.g., maize) perennial settlement	nonintensive foraging (e.g., pinyon nuts & other wild plants) specialized logistical hunting no horticulture nonperennial settlement	Sullivan 1992 Sullivan 2000 Sullivan and Ruter 2006 Whittlesey 1992 Schwartz 1990
Craft economy	local ceramic production	no ceramic production	Becher and Sullivan 1994 Sullivan 1986
Monumentality	none	none	Carter and Sullivan 2007

rich artifact assemblages and monumental architecture (but see Sullivan and Bayman 2007).

SUMMARY AND CONCLUSIONS

Anthropological archaeology is a potent approach for examining the evolution of property rights in precapitalist economies because almost all ethnographically documented societies were already under the “footprint” of international capitalism. The application of CPR theory in this study of the Southwest highlights the dynamic mix of social, economic, and climatic conditions that apparently favored, and in some cases precluded, the emergence of exclusionary property rights within a macroeconomy of hinterland and heartland societies. In the Southwest, exclusionary property rights developed in hinterland areas (such as the Papagueria) that had at least some potential for elevated agricultural production or extraction of raw materials for prestige goods that were valued by societies in the surrounding heartlands (e.g., Hohokam). Property rights did not emerge, however, in hinterlands (such as the Grand Canyon–Upper Basin) where opportunities for agriculture were more limited and materials for manufacturing prestige goods were lacking. Unlike the Papagueria, the Grand Canyon–Upper Basin was not closely bordered by powerful heartland societies that coveted its resources.

This study illustrates that CPR theory offers archaeologists a powerful means to consider microeconomic (i.e., household) decision making and its linkages to macroeconomic (interregional) processes. The approach used in this study also promises to refine anthropological models of the

origin and development of property, social identity, and macroeconomy in precapitalist societies.

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NOTES

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1. In one exception, Steadman Upham (1992) referred to hinterlands as the “open spaces” in the prehistory of the Southwest, and he argued that such areas often supplied resources that were vital to the economic and social reproduction of surrounding communities. From a complementary but somewhat different perspective, Joseph Tainter and Fred Plog (1994) dubbed these areas the “weak patterns” in archaeology of the Southwest because they lacked large nucleated settlements with elaborated architecture and material culture.

2. We acknowledge the perennial (i.e., century-plus) debate in anthropology and economics concerning the conceptualization of property and whether it existed in precapitalist societies (e.g., Hunt 1998; Nadasdy 2002; Neale 1998). We follow Hann (1998) and others in accepting the fundamental premise that property rights of some sort are universal in human societies. This premise does not assume, however, that institutions of property always enshrine rights of alienation.

3. We use CPR theory to initiate our analysis of ancient property rights in the Southwest because this approach offers a relatively well-developed body of theory. However, we do not mean to explicitly imply that social institutions of CPR use necessarily developed in our study areas. Indeed, our study areas might be best

characterized as "open access" systems that lacked formal social institutions for organizing the extraction and use of resources. We also acknowledge that many analyses of property conflate systems of "open access" and CPR use (Bell 1998:33).

4. Other smaller sites reflect more ephemeral locations at which foraging activities related to animal hunting and plant processing were undertaken (e.g., Doelle 1980; Lyon and Holloway 2000). Although William Doelle (1980) argues that faunal evidence of butchered game in the interior deserts was left by specialized hunters from villages along the Gila River, it is also likely that this activity was undertaken by local residents (Bayman 2007).

5. Although our usage of the concept of "tradition" is similar to Timothy Pauketat's (2001), we acknowledge that the archaeological operationalization of it still relies on a paradigm of artifact classification that was first developed and applied by culture-historians in the early 20th century.

6. The recent decade-long surge of archaeological fieldwork in the region, under the aegis of contract archaeology (e.g., Bayman 2001, 2007; Lascaux and Tucker 2000; Lyon and Gregonis 2000) appears to confirm this empirical generalization.

7. The Upper Basin lacks monumental architecture, such as Great Kivas and ballcourts.

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