

## COLLECTIVE LABOR IN ECONOMIC PRODUCTIVITY AND SOCIOPOLITICAL COMPLEXITY A COMPARISON BETWEEN CALIFORNIA AND THE MIDWEST

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*California prehistorically held between 5% and 10% of the population of North America, even though its land area constitutes only about 2.5% of the continent. The ecological achievement of supporting that big a population, especially without food production, might have involved highly sophisticated, managed collection strategies. Comparison with contemporary systems in the Midwest shows that California lacked the symbols of centralized management found there. This paper examines some dimensions of possible relationships among collective labor, centralized management, and population maintenance, to try to better understand the bases for prehistoric California's demographic success.*

### INTRODUCTION

The question about which this paper revolves concerns the role played by centralized organization in the subsistence productivity enjoyed by Native Californians prior to European contact. California provides a fascinating example of comparative productivity, one whose implication still can benefit from more exploring.

Depending on whose figures one uses, prior to European contact the area now encompassing California supported 5-10% of the population of North America, although the geographic area of California constitutes only about 2.5% of the continent (see, for example, Fagan 1995; Gibbon 1998). The high levels of population are made especially significant because, unlike other parts of the continent that supported large populations, most of California's cultures did not practice food production, but relied on various forms of hunting and gathering. This was the case in spite of the fact that Californians had the domestic dog, and many cultures in California practiced the cultivation of tobacco.

Lack of knowledge was not a significant barrier to food production, nor was an environment too hostile to traditional means of cultivation for them to work. Numbers of writers have noted the high levels of productivity of California's hunting and gathering (see, for example, Chartkoff and Chartkoff 1984; Moratto 1984). Some very insightful work has been done on the evolution of California adaptations from human or cultural ecological perspectives (e.g.

Erlandson and Moss, 2001; Hildebrandt and McGuire 2002; Rick et al. 2001). Less attention has been paid, however, to any relationship between the levels of productivity attained by prehistoric Californians and the nature of sociopolitical complexity and labor organization developed to achieve that level of productivity. In particular, comparisons with other parts of the continent are not often attempted. This paper offers one such comparative perspective.

### A MIDWEST COMPARISON

The campus where I teach lies in the Great Lakes region, a region whose prehistory was not characterized by enormous population density, political complexity, or subsistence productivity. Just to the south, however, lies a zone stretching from the Appalachians to the Mississippi, bounded on the south by the Ohio River and by the southern Great Lakes to the North. This part of the Midwest saw very substantial prehistoric development of subsistence productivity, population density, and sociopolitical complexity. The culmination was the development of upper Mississippian polities, such as Cahokia in Illinois or Aztalan in Wisconsin, with urbanized population concentrations of up to 30,000 people and control of territories encompassing thousands of square miles. The Mississippian system, however, was heavily reliant on maize cultivation, so it is not comparable with California (Fagan 1995: 427-452).

Prior to the Mississippian Period, though, in the Early and Middle Woodland periods occurring

between about 3,000 and 1,600 years ago, there emerged cultures with substantial development of complexity but with relatively little reliance on food production. The Adena cultures of the Early Woodland Period and the Hopewellian cultures of the Middle Woodland Period both had subsistence patterns that included some domesticated plant species, but not the later staples of maize and beans. Some seed- or oil-yielding species were cultivated, such as amaranths, goosefoot, and sunflowers, along with some cucurbits and tobacco. Gardening, however, had not become the major focus of subsistence and was not the central basis of population support (Fagan 1995:397-426; Lovis et al. 2001).

Even so, some Adena and Hopewell communities reached populations of 2,000 or more. Crucial to their support was intensive collection of key wild resources at their times of harvest. Wild nuts such as walnuts, hickory, hazel, beech, and acorns were important staples. Deer hunting, which had been an individual activity in earlier periods, became a group activity starting in the Early Woodland. Organized hunting teams from villages would drive deer during winter, when herds congregated, so that large numbers could be killed quickly. Then group task forces would butcher the animals and process the meat and hides in quantity. Similar task-force activities were used to do large-scale fishing.

In this sense, Adena and Hopewell food-collection activities have some counterparts in late-period California. Along the lower Klamath River, for example, communal fishing involving the construction of fish dams was a regular practice of the Yurok people (see, for example, Chartkoff and Chartkoff 1984). In the Santa Barbara region, organized canoe crews conducted large-scale net-fishing operations in the Santa Barbara Channel. For the Chumash in particular, it was possible to support communities with populations of several hundred people. A few communities reportedly reached populations of a thousand or more (see Moratto 1984, for example).

Yet there were significant differences. If one compares Hopewell nut harvests with those found around California, for example, the degree of organized labor was much greater with the Hopewell. In California, acorn harvesting was essentially a household task, not an organized community activity.

California and the Great Basin nevertheless still had several examples of collective hunting with such activities as Shoshonean rabbit drives. The return of meat volume per participant with rabbit drives is but a tiny fraction of the yield with Hopewell deer drives, however. Trapping 1,000 rabbits could yield at least 3,000 pounds of edible meat, plus their fur and bones. If a Hopewell deer drive yielded 500 deer, however, the meat yield would be 25,000-50,000 pounds, with a vastly greater number of hides and bone.

Archaeological evidence suggests that the Adena and Hopewell may have practiced a good deal more centralized management of collected resources than we find in California. In California villages, one finds storage pits in family houses, and storage silos outside them, in many areas. The Adena and Hopewell villages, by contrast, appear to feature more centralized storage facilities, presumably managed by the village leadership. Centralized collection and redistribution seem to have been much more characteristic of the Adena and Hopewell cultures than we find in California.

One indicator of these differences can be seen in treatment of the dead. Adena and Hopewell cultures developed monumental burial-mound systems with which to recognize and honor deceased leaders (Fagan 1995:403-407; Jennings 1989:230-247). The Late Adena Grave Creek mound at Moundsville, West Virginia, for example, was more than 65 feet high. In addition, Hopewell communities in particular developed a number of monumental public facilities, such as public passageways overlaid with their margins defined by long earthen ridges, and large, enclosed, public ritual spaces walled in by linear earthworks (Fagan 1995:418-422; Ruhl 1998). Many California communities had dance houses or sweat houses, forms of public facilities, but their scale is dwarfed by the Midwestern earthworks both in size and in labor invested (e.g. Chartkoff and Chartkoff 1984:210). These and other indicators suggest that Adena and Hopewell had far greater degrees of status differentiation and power concentration than occurred in prehistoric California.

It is worth considering why the two systems, each practicing highly effective collecting and each able to support larger communities than many of the horticultural systems around the

world did, had such different expressions of status and centralization of power. This difference is still not adequately explained, but some possible factors are suggested here.

One aspect may involve the nature of resource distribution and the work needed to harvest resources in quantity. The Midwest's woodlands, for example, are rich in nut-bearing trees (Petrides [1988] lists more than a dozen species of oaks alone that are native to Ohio), but the biomes are complex, with a great deal of local diversity. Thus the density of any particular resource often is not very high. In California, by contrast, some key resources can be found in great density. The blue oak, for example, can occur in hillside groves of as much as 500-1,000 trees with essentially no diverse forest involved. Blue oaks can average more than 200 lbs. of acorns per year per tree, so a single grove could yield 100 tons or more. Many California villages had several groves nearby. Individual families could often reach far more acorns than they could ever collect and carry to camp. In the Midwestern woodlands, by contrast, the dispersal of valuable subsistence resources made their collection in bulk at harvest time much more difficult, so the adaptive value of centralized labor management may have been much greater.

California certainly had important cases of the use of collective labor, from the Yurok fish dams to the Chumash plank-canoe crews (Chartkoff and Chartkoff 1984; Oswalt and Neely 1999:214-246), but appears to have been able to achieve high levels of harvesting, processing, and storage with much less collective labor than developed in Adena and Hopewell. It may be that the ecological differences in resource diversity and dispersal between the two regions were significant factors.

Another possible dimension may have been the comparative value of centralized labor and resource management. Where the centralized management of labor is adaptively important, the means to do so is associated with significant differences in social rank and status. Such differentiation also tends to be associated with the ability to centrally manage and redistribute the resources collected. Northwest Coast cultures, for example, featured greater degrees of political centralization than did California cultures, and also featured greater centralization in the collection and redistribution of resources, as

illustrated by potlatch ceremonies (Oswalt and Neely 1999:249-289).

In the Midwest, the Adena and Hopewell cultures seem to have had socio-political systems that were even more status-differentiated than in the Northwest Coast. The Hopewell and Adena systems are usually understood to have included a number of paramount chiefdoms. Chiefdoms also occurred in the Northwest Coast, and a few may have developed in a few California regions, but they do not appear to have developed the degree of centralization that the Midwestern examples did. The California systems in particular seem to have been able to achieve somewhat comparable levels of per-capita resource generation with much less institutionalized status and authority.

Yet another dimension may have involved participation in exchange networks. East of the Rocky Mountains, and especially east of the Great Plains, transcontinental exchange networks emerged during the Late Archaic Period and often flourished increasingly. Hopewell and Adena sites often yield artifacts made of materials from a variety of distant locations: sea shells from the Gulf Coast, mica from the Appalachians, and copper from northern Michigan are examples (e.g. Fagan 1995:417-418; Seaman 1998:372-373). One Hopewell burial in Ohio yielded 4,000 pounds of obsidian from Yellowstone National Park in Wyoming — about 99% of all the obsidian ever found east of the Mississippi River (e.g., Jennings 1989:238-243). Exchange certainly was a factor in California economies, but it was more modest in volume, diversity, and geographic range compared with those Early and Middle Woodland examples, with the particular exception of the development of money systems based on strings of shell beads (e.g., Chartkoff and Chartkoff 1984). In addition, Adena and Hopewell communities themselves developed impressive local craft production to generate high-quality goods both for export in the exchange system and for consumption by local elites. The emergence of craft specialization and semi-specialization also suggests degrees of centralized management beyond the levels found in California.

One way to gain some additional insight into the differences between the levels of socio-political complexity developed in California and the Midwest may lie in an ecological perspective. A relevant principle developed by ecologists is

known as Romer's Rule (Romer 1960). Though it has been expressed in many ways, one form says that population size or density is determined by the number of individuals that can survive through the period of greatest scarcity of the most critical resource. For many hunter-gatherer populations, autumn is the season of abundance, but six months later the wild food supply is at its lowest, so population is determined by the key resources available in that season, generally late winter. This dynamic certainly seems to have had its effect in California's Archaic period. As the Late Period advanced, however, that seasonal scarcity was increasingly ameliorated by the collection of surpluses in the autumn and their storage to provide food during the season of scarcity. Why this strategy was adopted in California, why it was adopted when it was, and why it did not lead to greater ecosystem management as it did in other regions, still need to be better understood.

On one hand, the achievements of Adena and Hopewell can be appreciated for their magnitude of quality. On the other, California systems were able to be as productive in subsistence and population support without having to develop such degrees of centralized power and differences in status, which is a tribute to the effectiveness by which Californians developed productive subsistence strategies in their environments. As suggested above, one relevant dimension may lie in the differences between the biomes of the two regions, in which the effective extraction of seasonal surpluses may demand different degrees of centralized management.

Yet it remains that the nature and magnitude of socio-political complexity among prehistoric California communities is still not as well understood as it might be. I therefore would like to suggest this topic as one that could merit a good deal more emphasis in future examination and explanation.

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