

REMODELING CALIFORNIA PREHISTORY: NOTES ON THE CHANGING ROLES OF ETHNOHISTORY IN ARCHAEOLOGY

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ABSTRACT

The scope of archaeological model building in California has expanded dramatically during the last decade, inevitably challenging established reconstructions of prehistory. This challenge reveals the central but questionable role that ethnohistory has played in past archaeological research. Sometimes confused with objective cultural reality, many currently popular "ethnographies" are theory-laden hypotheses inspired by influential eco-functional models of hunter-gatherer behavior. The highly idealized reconstructions of prehistory promoted by these hypotheses are increasingly at odds with archaeological evidence of punctuated, stress-induced and sometimes maladaptive culture change. This clash is fueling valuable scientific innovation, including models that more effectively integrate ethnohistory and archaeology.

MODELING CALIFORNIA PREHISTORY

An impressive stream of monographs, books and journal articles dealing with California prehistory has appeared in national and international publications during the last decade, attesting perhaps to a regional archaeological renaissance. Works that illustrate this trend – admittedly a limited and unsystematic sample – include Arnold (1992, 1995), Broughton (1994a, 1994b, 1997), Bettinger (1991), Broughton and O'Connell (1999), Colten and Arnold (1998), Connolly *et al.* (1995), Erlandson (1994), Erlandson and Colten (1991), Glassow (1996), Hildebrandt and Jones (1992), Jones (1991, 1992), Jones and Hildebrandt (1995), Jones *et al.* (1999), King (1990), Lightfoot (1992), Raab *et al.* (1995a), and Raab and Larson (1997). While these discussions reflect diverse topics and regional settings, their common focus on explanatory models seems to be a key element in winning new audiences for California archaeology far beyond the state's boundaries. Model-building -- the pursuit of theory-based explanations of culture change through empirical research designed explicitly for this purpose -- has always exerted some influence on California archaeology, but efforts of this kind have proliferated in recent years, stimulating a series of lively debates between opposing theoretical camps

(see, e.g., Arnold *et al.* 1997; Arnold and Pletka 1997; Broughton and O'Connell 1999; Byrd *et al.* 1998; Colten and Arnold 1998; Hildebrandt and Jones 1992; Raab and Larson 1997). As perhaps never before, theoretical approaches of all kinds are "on the table" for dissection and debate.

These developments are shaking up an often complacent and doctrinaire archaeological establishment. Recent model-building efforts challenge the highly idealized models of California prehistory that have been promoted by many archaeologists and their allies in ethnohistory over the last three decades. Mindful of the space available here, and in keeping with my own areas of research experience, I focus mainly on how these cultural idealist models emerged in coastal southern California, and how they are being challenged by more recent research in archaeology and ethnohistory. Despite this regional emphasis, it is possible to identify shifts in thinking that carry implications for California archaeology as a whole.

Like other regions of the state, reconstructions of southern California coastal

prehistory were bolstered for decades by hypotheses of ethnohistoric inspiration. As we shall see below, these reconstructions reigned largely unchallenged for decades, achieving immense popularity with academics and the public alike. Today, this complacency is succumbing to the fast-paced publication of new archaeological data and vigorous debates about competing research models. The inevitable result is an atmosphere in which research models of all types, including ethnohistorical reconstructions, are receiving more critical scrutiny. Icons of ethnohistorical interpretation, utilized for decades to support popular scenarios of prehistoric culture change, now clash directly with the results of more recent model-building efforts. It can be argued that this clash is having two positive outcomes. First, as viewed against the backdrop of increasingly diverse models of prehistoric culture change, the pitfalls of certain types of ethnographic analogy are increasingly apparent, and therefore more readily avoided by archaeologists in the future. Secondly, recent studies suggest that ethnohistoric research will continue to play an important role in modeling prehistoric cultural patterns, but in ways that may depart substantially from past modes of interaction between archaeology and ethnohistory.

PROBLEMS WITH ETHNOHISTORY

There is little benefit to be gained from belaboring possible distinctions between the terms *ethnographic* and *ethnohistoric*. For purposes of the present discussion, the two terms are employed largely interchangeably. On the other hand, this usage should not gloss over some important considerations. Important here is the common but potentially misleading assertion that California is particularly well suited to ethnographic research. Native California certainly contained an astonishingly diverse array of separate cultural groups; to such an extent, in fact, that Kroeber (1925) struggled to characterize this phenomenon, settling on the term *triblets*. It is a mistake, however, to assume that this situation translates automatically into "rich" sources of "ethnographic data." It may be more accurate to say that California has a large but highly variable range of historic information about the state's indigenous peoples.

If we constrain our definition of ethnography to

something like its meaning among contemporary social anthropologists--coherent cultural narratives, systematically collected and validated by professionally trained observers--the information available for many California native groups would fall outside this definition. For instance, Kroeber's (1925) classic *Handbook of the Indians of California* reveals a huge disparity of detail in describing various native Californian societies. Of course, this disparity reflects the fact that information about the culture of many California Indian groups was not collected in any systematic way until centuries after they were affected, often catastrophically, by contact with Europeans or Americans. Given these circumstances, the term ethnohistoric probably better captures the eclectic nature of the information that is available for many regions of California in the form of explorers' diaries, Spanish colonial records, early newspaper accounts, the notes of amateur and professional anthropologists and other sources.

Another common but misleading assumption about these sources, whatever label one might apply to them, is that they are problematic for archaeology primarily owing to their eclectic and fragmentary nature: If only we had more ethnohistoric information, we could perceive a more accurate picture of pre-contact native lifeways. The reality of the situation is far more complicated. While limitations of the ethnohistoric record may leave many questions unanswered, faulty archaeological inference strategies that employ this information may result in analogies between present and past that are not merely limited but actively misleading about the nature of prehistoric cultural patterns.

Archaeologists are not entirely naive about these difficulties. Ethnographic analogies have been a staple element of archaeological research from the inception of the discipline. This experience offers a widely discussed range of problems and possible solutions to the use of ethnographic data for purposes of archaeological inference. As Gould (1974:38-39) notes, ethnographic analogies can be thought of as "continuous" or "discontinuous," depending on how direct is the connection

between the ethnographic and archaeological cases being compared. Continuous analogies are valuable inference tools when "there was historical continuity with little culture change between the ethnographic case cited and the past being interpreted" (Binford 1983:7). This type of analogy forms the basis of what is frequently referred to as the *direct historical approach* (Willey and Sabloff 1980:108-109).

Analogies of the discontinuous sort are the only possibility in many cases, greatly compounding uncertainty about the reliability of resulting inferences. Various solutions have been proposed to this difficulty, including restricting analogies to societies that share similar natural environments or like economic or technological strategies (Ascher 1961). Some researchers have suggested bolstering the strength of discontinuous analogies by casting them as testable hypotheses to be evaluated with multiple lines of evidence (Binford 1967). In recent years, archaeologists have argued for a more powerful methodological attack on the problem. One such strategy uses ethnographic cases to identify uniformitarian cultural and natural forces that shape formation of the archaeological record. In this vein, Binford (1978, 1980, 1981a) has argued for the role of "actualistic" or middle-range strategies of analogical inference based on uniformitarian site-formation, biophysical or technoeconomic principles. Contemporary researchers have also turned to cross-cultural statistical surveys as a source of empirical generalizations that may be used to form hypotheses and strengthen ethnographic analogies (Kelly 1995).

Although debate continues about the proper uses of ethnographic analogy in archaeology (e.g., Kelley 1995:333-344), there is widespread recognition that archaeologists cannot convincingly equate ethnohistoric observations with prehistoric cultural behavior in any simple, reflexive way. Despite this recognition, two problems persist in California archaeological research: Unwarranted confidence in ethnohistoric reconstructions, and misuse of the direct historical approach.

There seems to be an implicit assumption by some researchers that ethnohistoric sources are superior to the archaeological record on epistemological grounds. Observations derived from living people or written accounts are sometimes seen as more "real" than the impersonal information

typically derived from archaeological contexts. Ethnohistoric observations appear to reflect cultural reality in a direct way, while archaeological information comes to us indirectly through inferences about the past; hence, the former is less hypothetical than the latter. There are a number of difficulties with these perspectives, but two are particularly compelling. First, although speaking specifically about the situation of the Pomo Indians of the Russian River area of northern California, Lightfoot sounds a clear warning about the use of uncritical ethnohistoric realism as a tool of archaeological inference:

It is unclear whether...ethnographic case studies describe actual ...patterns that once operated in the region prior to Euro-American contact. They may, in fact, reflect "shreds and patches" of practices dating to the mid-19th, late 19th, and early 20th centuries. In any event, these ethnographic studies should be viewed only as models that represent explicit endeavors to reconstruct Indian lifeways prior to European contact. There is no necessary objective reality inherent in the scenarios; they are hypotheses....(Lightfoot 1992:42).

Many, if not all, regions of California are subject to similar limitations, and this fact alone should caution against reflexively assuming that ethnohistoric sources necessarily yield more valid insights into prehistoric cultural behavior than the archaeological record. A second point is that "quick time" historical scenarios — whatever their accuracy — capture a different order of reality than the centennial or millennial-scale resolution of cultural behavior that often characterizes archaeological research. This difficulty stems from what Binford (1981b) dubs the "Pompeii premise;" namely, the distortions that arise from imposing static, Pompeii-like cultural dioramas on archaeological records whose most salient characteristic is in fact behavioral change.

Despite these cautions, some investigators cling to naive ethnohistoric realism, using this perspective as a warrant for the direct historical

approach. One of the misadventures in archaeological inference that results from this strategy is assigning cultural meanings and functions to archaeological patterns spanning thousands of years. As Arnold and O'Shea (1993), point out, this practice makes sense only if we are willing to make the extremely dubious assumption that millennia-old cultural patterns were not much different than those of the historic era. A related problem is treating archaeological and ethnohistoric information as though they are analytically interchangeable. For instance, if investigation fails to result in strong archaeological pattern recognition, the situation can be "corrected" on the basis of what we "really know" from ethnohistoric observations. While this may be a tempting way for archaeologists to resolve analytically ambiguous situations, the credibility of this strategy is vitiated by circular logic (Raab 1993, 1996).

On close inspection, ethnohistoric reconstructions turn out to be fully as inference-dependent as archaeological reasoning. Not only should ethnohistoric reconstructions be viewed as hypotheses, we should recognize that these scenarios take interpretive shape and direction from the theoretical context in which they are erected. On this account, there is little difference between modeling archaeological and ethnohistoric data. In the next section of this discussion, we explore the theoretical underpinnings of one of the most popular ethnohistoric models employed by contemporary California anthropologists, arguing that this model has been shaped in crucial ways by certain cultural-ecological and functionalist theories.

THE RISE OF ECO-FUNCTIONALISM

During the first half of this century, southern California coastal archaeologists were absorbed mainly by their efforts to discover cultural stratigraphy. In an atmosphere dominated largely by empirical concerns, theorizing about culture change was relegated to a comparatively modest, *ad hoc* role. For example, authorities such as D. B. Rogers (1929) suggested that migration of new peoples to the California coast might explain the observed changes in the archaeological record. After World War II, the priority of empirical over theoretical objectives began to reverse. American archaeology was inspired by an increasingly diverse array of theories, notably including cultural evolution, cultural

ecology and related forms of neo-functionalism (Bettinger 1991; Trigger 1989). By the 1950s and 1960s, migrationist concepts made way for cultural ecological theories, as increasingly ambitious models of California coastal prehistory were developed. Influential discussions by Meighan (1959) and Warren (1968), for instance, argued that prehistoric culture change could be explained to a substantial degree as *in situ* adaptations to the natural environment.

In the 1970s, theorizing about California prehistory was carried along by a resurgence of interest in hunter-gatherers by American anthropologists. In the trend-setting volume *Man the Hunter*, Lee and Devore (1968) launched a powerful new cultural icon in the form of "affluent" foragers. According to this analysis, hunter-gatherers not only escaped the Hobbesian curse of hunger, misery and premature death, they were able to do so with less labor than that typically imposed on the members of industrial society. This surprisingly successful achievement was credited to economic, technological and social organizational adaptations that were clever, highly effective and environmentally friendly (Bettinger 1991; Kelly 1995). Suddenly, hunter-gatherer groups everywhere were found to be instances of adaptive success, rather than the primitives imagined for centuries by Euro-Americans as barely clinging to survival.

This new cultural-ecological interpretation instantly found a home in academia and popular culture. On one level, it offered a novel alternative to centuries of rigid cultural-evolutionary thinking. Hunter-gatherers could now be viewed as intrinsically interesting case studies of cultural adaptation. At the same time, the new ecological interpretations received a substantial boost from prevailing social and academic attitudes toward contemporary industrial society. As Bettinger (1991:48) points out, the image of hunter-gatherers as citizens of nature evoked considerable approval in an era gripped by "a pervasive disillusionment with technology, the politics of industry and industrial states, and the callous treatment of the natural environment." Hunter-gatherers looked increasingly like Rousseau's "noble

savage" of centuries earlier, albeit in a modern eco-primitivist context.

It was soon clear to some California researchers that the new lines of cultural-ecological thinking offered a valuable way of illuminating what had long been perceived as the state's virtually unique cultural-environmental history. These possibilities were explored, for example, in *Native Californians: A Theoretical Retrospective*, a series of papers edited by Lowell Bean and Thomas Blackburn (1976). Most of the views expressed in this volume emphasized the ecological sophistication of Native Californian cultures. Perhaps the most ambitious claims were posed by Bean and Lawton (1976), who argued that California hunter-gatherers should be viewed as "quasi-agriculturalists." The use of acorns was the center piece of this claim, but high levels of economic productivity were attributed to other practices as well, including controlled burning of the landscape (Blackburn and Anderson 1993).

The notion of a quasi-agricultural mode of production answered a nagging legacy of Victorian progressive evolutionism. It had long been held that agriculture equated with a "Neolithic" level of socioeconomic complexity. But what would be the impact if hunter-gatherers could attain equivalent modes of economic production? The resulting answer was that California, owing to an unusually productive set of relations between culture and environment, could have supported complex socioeconomic patterns similar to Neolithic societies. While Bean and Lawton (1976) were among the first to explicitly attribute highly elaborated socioeconomic institutions to quasi-agricultural economics, characterizations of this kind have since become a staple of references to native societies of southern California (Chartkoff and Chartkoff 1984; Fagan 1995; Gibson 1991; King 1990, 1994; McCawley 1996; Wilson 1993). At the same time, theories of cultural evolution based on redistributive economics gained wide popularity among American anthropologists in the 1970s, and it was not long before dynamics of this kind were attributed to the prehistoric California Indian groups (King 1976, 1990).

We should not ignore the impact of these concepts on popular culture. In recent decades, Indians have been viewed with increasing sympathy not only as victims of Euro-American civilization, but

perhaps as bearers of lifeways that are superior to those of modern industrial cultures. The dramatic way in which these developments re-oriented perceptions of California Indians is difficult to overstate. Within the social and intellectual frameworks that dominated both public and academic thinking over the last four centuries, California Indians were generally viewed as "primitives;" i.e., as peoples defined by the institutional and technological traits that they lacked in comparison to civilized societies (Rawls 1984). Within the context of cultural ecology, hunter-gatherers are not only instances of successful cultural adaptation but also worthy of praise because, unlike civilized societies, their connections to nature are assumed to be essentially benign (Blackburn and Anderson 1993; Haley and Wilcoxon 1997).

Bettinger (1991) aptly describes recent models of hunter-gatherer adaptation as neo-functionalism, denoting a revival of certain theoretical interests in American anthropology. Earlier in this century, anthropologists frequently attributed the persistence of cultural traits to their "functions" in maintaining societal homeostasis. In the case of ecologically-inspired functionalism, cultural traits tend to be explained in terms of their role in bringing about successful adaptations to the ecological circumstances in which foragers find themselves. Perhaps the term "eco-functionalism" better describes how this theoretical program has been applied to popular theories of hunter-gatherer adaptation in California.

In perhaps the most archaeologically detailed of these models, King (1976, 1990) presents evidence of variation in ornaments and marine shell beads derived from prehistoric and historic grave lots to support hypotheses about changing socioeconomic patterns over a time span of about 7,000 years. This work was a landmark contribution to chronology building in the Chumash region, a widely cited example of eco-functionalism interpretation (e.g., Fagan 1995:248-256), and an inspiration to eco-functionalism reconstructions of other regions of southern California (McCawley 1996). Yet, when King's model was under construction more than

a quarter-century ago, the archaeological literature was essentially devoid of detailed data on prehistoric dietary patterns, settlement modes, human health conditions and other topics that clearly are critical to evaluating the validity of eco-functionalism. Careful reading of early (or contemporary) eco-functionalist manifestos reveals scant archaeological data offered in direct, convincing support for the cultural-evolutionary dynamics being advanced (Bean and Lawton 1976; King 1976, 1990, 1994; McCawley 1996). This same critical scrutiny reveals that ethnographic analogies, rather than archaeological data, tend to carry this burden.

While eco-functionalism became firmly established in California anthropology, the scope of California archaeological research expanded explosively, particularly under the impact of public policy mandates. The publication trend described at the outset of this discussion attests to a vastly larger and more detailed body of archaeological information than existed even as recently as a decade ago. Modeling prehistoric culture change can now advance along a diversity of theoretical lines, but not necessarily in ways that are dependent on ethnohistory.

ECO-FUNCTIONALISM IN QUESTION

A telling way to gauge the impact of recent model-building efforts on thinking about California prehistory is to examine archaeological research on the late Holocene. Eco-functionalist renditions of California prehistory almost invariably feature the notion of a late Holocene cultural climax. Although this climax is usually envisioned as the terminus of certain developmental periods or stages, the whole sequence is conspicuously cross-cut by a series of technoeconomic and social adaptations that are thought to have unfolded gradually over the span of the Holocene in a continuously productive natural environment (Chartkoff and Chartkoff 1984; Fagan 1995; King 1990; Landberg 1965).

At the same time, a sense of seamless transition from the prehistoric past to the ethnohistoric present is often conveyed by these models. Some notion of these dynamics can be gained, for example, from the reconstruction of California prehistory by Chartkoff and Chartkoff (1984). Although authorities might quibble about various aspects of this reconstruction,

it presents a largely conventional understanding of California prehistory in its successive Paleo-Indian, Archaic and "Pacific Period" stages of cultural development. In general terms, Chartkoff and Chartkoff posit that late Pleistocene lifeways based on big-game hunting (Paleo-Indian Period) evolved into seasonally mobile foraging within essentially modern climatic regimes (Archaic Period), and these mid-Holocene adaptations gave rise in turn to the most socioeconomically complex cultural formations of the whole sequence during the late Holocene (Pacific Period). The late Pacific Period (A.D. 500 to 1500) is specifically identified as a stage of cultural development in which marine resources, combined with previous terrestrial economic strategies, boosted coastal groups to unprecedented levels of population size, regional trade, food storage, residential sedentism and socioeconomic complexity. This developmental scenario bears a conspicuous similarity to the model by King (1976, 1990) noted earlier. A more interesting feature of the Chartkoff and Chartkoff (1984:180-181) model, however, is the way in which the Pacific Period is positioned as a crucial cultural-evolutionary interface, where the whole expanse of trans-Holocene cultural evolution is linked to the ethnohistoric present in coastal southern California:

During the late Pacific, almost all of the economic, technological, and social traits characteristic of the historical cultures were fully developed. Riverine and ocean fishing reached their greatest productivity. Population levels rose markedly and societies became increasingly complex...

From their homes along the coastal littoral, Canaliño people... developed an extremely focal economy, based on two techniques: offshore fishing and sea mammal hunting using plank canoes, and the seasonal collection of acorns, hard seeds and shellfish...[emphasis added].

Of course, one could view this scenario merely as a descriptive device, not an argument

for any particular theory of culture change. Through eco-functionalist eyes, however, scenarios of this kind carry a crucial implication: If there was a seamless adaptive transition from prehistory to history, then ethnohistoric observations afford a valuable starting point for "retrodicting" the prehistoric cultural patterns of which they are a culmination. Sometimes unnoticed here is the begging-of-the-question about cultural continuity implied by the assertion that the "traits characteristic of the historical cultures were fully developed" during late prehistory. Intended or otherwise, interpretations of this kind seem likely to encourage ethnohistorical realism and explanation of prehistoric cultural patterns by direct historical analogy.

As a result of recent model-building efforts in archaeology, we are in a better position than ever to assess the degree of adaptive continuity between the prehistoric past and the ethnohistoric present. In fact, some of the sharpest debates that have emerged from these efforts involve the Late Period, or the time interval from about 3,500 years B.P. to European contact. Even a brief survey of two areas of recent archaeological research casts eco-functionalist reconstructions in an instructive light:

The Causes and Speed of Culture Change

Eco-functionalist theories undoubtedly promote certain biases regarding the nature of culture change. The emphasis of these models on the adaptive success of hunter-gatherer behavior yields an essentially homeostatic view of culture. Bettinger (1991) is quite right in pointing out that this theoretical stance offers a poor basis for identifying the causes of culture change. As typically successful equilibrium-seeking behavioral systems, hunter-gatherer societies would presumably experience little or no culture change over long periods of time, unless they were nudged into a different trajectory by some kind of internal behavioral innovations. Scenarios of this kind would seem to rule out the likelihood of more "punctuated" forms of culture change resulting from intra- or extra-societal forms of stress. King (1990:xviii-xix), for example, explicitly rejects environmental stresses as a source of prehistoric culture change in the Chumash culture area, arguing that the region's ethnohistoric records reflect cultural adaptations that were robust enough to manage any stressful environmental forces that were likely to arise (King 1994).

Recent models diverge dramatically from theories of developmental gradualism. Investigators argue, for instance, that acute stresses incident to changes in marine and climatic conditions may have been a significant factor in late Holocene culture change (Arnold 1992, 1995; Colten and Arnold 1998; Jones *et al.* 1999; Raab and Larson 1997), including the relatively abrupt emergence of social complexity (Arnold 1992). Jones *et al.* (1999) present evidence from several regions of California and the American West for a correlation between severe and persistent Medieval-era droughts and widespread, dramatic alterations to regional settlement patterns, economic practices, trade dynamics and human health.

Recent studies also argue for fundamentally different kinds of social relations than those envisioned in eco-functionalist models. Where earlier reconstructions often featured dynamics in which elites obtained social and economic power from providing essential managerial skills (King 1976, 1990), more recent models feature conflict-driven social dynamics. These include neo-Marxist concepts in which elites derived power from the coerced exploitation of crafts production (Arnold 1992, 1995), and a late Holocene cultural landscape in which warfare and violent competition over scarce resources may have encouraged the rise of social complexity (Johnson 1998; Lambert and Walker 1991; Lambert 1993, 1994).

Declining Foraging Efficiency, Human Welfare, and Gender Roles

Resource intensification studies are met with scant enthusiasm by eco-functionalists for easily discernable reasons. Several recent studies argue, for instance, that prehistoric culture change in California was probably influenced to an appreciable degree by a long-term "loss of foraging efficiency." This concept menaces notions that are axiomatic to eco-functionalist thinking; i.e., that prehistoric natural environments were continuously productive of food resources, and that these resources were exploited with progressively greater efficiency. Moreover, intensification theorists offer radically different explanations for many of the cultural-evolutionary developments featured in eco-

functionalist models. Broughton and O'Connell (1999) argue, for instance, that a long-term loss of foraging efficiency in California likely played a pervasive role in triggering changes in both natural and cultural environments, including over-exploitation of the most productive food resources, technological and social-organizational innovation, violent territorial competition, declining human health conditions, expansion of trade networks and increasing social complexity.

Models of intensification are grounded in theoretical principles of evolutionary ecology (Broughton and O'Connell 1999; Kelley 1995; Smith and Winterhalder 1992). In an archaeological context, these models are given impetus by some of the most frequently noted characteristics of post-Pleistocene hunter-gatherer economies around the world. Most definitions of resource intensification emphasize processes that result in a greater yield of food per capita or per unit of land by foragers, but at the expense of consuming an increasingly broader range of less productive plant and animal species (Broughton 1994a, 1994b; Cohen 1989; Hayden 1981; Raab 1996). Archaeologists often prefer to examine these processes, particularly as regards their cost-benefit characteristics, in relation to optimal foraging or prey-choice models (Broughton and O'Connell 1999).

Another way of describing intensification is in relation to *foraging efficiency*, as estimated by applying certain cost-benefit measures. In two California study areas, for instance, Broughton (1994b:501) characterizes the process of intensification as one in which, "the total productivity per areal unit of land increased at the expense of overall foraging efficiency," where efficiency is gauged by the body size of prey items and the relative time/energy costs that would have been required to capture and process the species in question. Since small food items (both vegetal and animal) often involve comparatively high technological, pursuit and processing costs, foraging patterns based on these resources may be less efficient in energetic terms than, say, hunting large animals.

In particularly striking case studies, Broughton (1994a, 1994b, 1997) argues that consumption of increasingly smaller vertebrate species in San Francisco Bay and in the Sacramento Valley during

the late Holocene signals a progressive loss of foraging efficiency. Byrd *et al.* (1998) argue for essentially similar dynamics in a recent summary of archaeological investigations of the Camp Pendleton Marine Corps Base on the northern San Diego County coast. In the Camp Pendleton case, large terrestrial mammals played a declining role in the diet from about 7,000 years ago to historic times, with small marine shellfish, fish and other marine species playing a concomitantly larger role. With regard to marine mammals, Hildebrandt and Jones (1992) offer a model for the Oregon and California coasts in which they argue that over-exploitation of seals and sea lions led to the rise of new hunting strategies and technologies by the late Holocene. Similarly, in a study of trans-Holocene economic change at the Eel Point site on San Clemente Island, Porcasi (1995), Porcasi *et al.* (1998) and Raab *et al.* (1995b) show that intensification of fishing began about 3,500 years B.P. in the wake of declining productivity in the harvesting of shellfish and large sea mammals. In the Vandenberg Air Force Base region near Point Conception, Glassow (1996) also demonstrates significant, trans-Holocene trends toward resource intensification.

Heralded by eco-functionalists as the quasi-agricultural mainstay of California prehistory, more recent work suggests that consumption of acorns was comparatively inefficient in terms of net caloric yield (Basgall 1987). Subsequent archaeological investigation tends to support this argument (Wohlgemuth 1996), including recent studies of the Camp Pendleton region (Byrd *et al.* 1998) in southern California.

Data on prehistoric human health trends are crucial to evaluating late Holocene cultural adaptations. It seems logical to suppose that if cultural adaptations improved in the fashion envisioned by eco-functionalist models, human health conditions would have benefitted from these advances. This expectation is not borne out by testimony from the dead. Based on a large body of human skeletal evidence spanning about eight millennia, it appears that health problems in the Santa Barbara Channel area increased gradually from early to late Holocene times, with disease and violence

reaching particularly high levels in the same time interval that eco-functionalists reconstruct a highly successful cultural climax (Lambert 1993; Lambert and Walker 1991; Raab 1996; Raab and Larson 1997). This contradiction is particularly telling, since the Chumash area is ostensibly a region that, according to eco-functionalist notions, should have benefitted from some of the most advanced socioeconomic innovations in prehistoric California.

Arnold (1997) may be correct in suggesting that population growth caused increased crowding of communities around water sources, thus exposing people to water-borne pathogens. However, this hypothesis does not adequately account for a variety of health-related conditions evident in the skeletal data, such as high rates of late Holocene violence, stature reduction and other problems. A trend toward loss of foraging efficiency across the Holocene remains a logical cause of at least some of the documented health problems. Furthermore, mounting biological stress, combined with relatively low levels of foraging effectiveness, might have made late Holocene climate flux far more damaging to human populations than comparable levels of paleo-environmental stress during the middle or early Holocene (Byrd *et al.* 1998; Jones *et al.* 1999; Raab and Larson 1997).

Recent research on the origins of gender-based divisions of labor is another area in which interesting new models were not anticipated by eco-functionalist reconstructions. Walker and Erlandson (1986), Jones (1996) and McGuire and Hildebrandt (1994) argue, for example, that gender-based divisions of labor probably were not fixed during California prehistory. In fact, many of the gender-based socioeconomic roles observed in the ethnohistoric record may have developed relatively late in prehistory. This work suggests that, contrary to impressions of a timeless division of labor among foragers, sharply defined differences in patterns of labor between men and women in prehistoric California may have followed socioeconomic shifts brought about by the demands of long-term resource intensification.

Following another implication of intensification research, California researchers have pointed to a fascinating "disconnect" between proto-historic archaeofaunal evidence and a landscape described as nearly overrun by large mammalian species at the

time of early European and American exploration. As Preston (1996) and Broughton (1997) argue, the latter observations have helped to forge a myth that pre-European California was akin to Eden. And yet, the archaeofaunal data from some of the same regions point to a depression of large animal stocks during the late Holocene (Broughton 1994a, 1994b, 1997). How can the archaeological evidence be reconciled with historic observations? One possibility, suggested by Broughton (1997) and Preston (1996), is that harvest pressure on large mammals, which had intensified for millennia, was greatly reduced by widespread, disease-induced mortality among California Indians in the more than two centuries that elapsed between initial contact with Europeans and the colonization of California by the Spanish. Such conditions might be expected to result in a sharp rebound of heavily-exploited animal populations. Clear indications of epidemics in the time frame of interest is currently lacking, but a good deal of circumstantial evidence points to the possibility of mass-mortality among California Indians in the pre-mission historic era (Erlandson and Bartoy 1995). The point here is not to argue that intensification studies prove the disease and population-rebound hypotheses. Rather, it is interesting to note that intensification studies are generating hypotheses of sufficient interest to launch new lines of investigation that combine both ethnohistoric and archaeological evidence.

In light of the models described above, consider the following characterizations offered by a widely circulated textbook on North American prehistory:

The Chumash exploited a great diversity of food resources. They hunted and trapped every kind of small animal, even rats and squirrels... "It may be said that for them, the entire day was a continuous meal," wrote one Spanish missionary marveling at the varied food resources enjoyed by the Chumash.

The annual acorn crop was a vital staple, gathered from the oak forests and foothills inland. The Chumash also ate

other plant foods, including walnuts, wild cherry pits, pine nuts yucca, and seeds from wild herbs and grasses, whose growth they fostered by deliberate burning.

In other areas of North America, the emerging cultural and social complexity often foreshadowed more sedentary lifeways based on maize agriculture.

But right up to European contact in the 16th Century AD, the inhabitants of the Pacific Coast and inland were still enjoying a hunter-gatherer lifeway that had begun to evolve as long ago as the Early Holocene. There is every reason to believe that they were perfectly familiar with maize agriculture and farming.

However, the sheer bounty and diversity of the natural resource base made this subsistence strategy unnecessary (Fagan 1995:252 and 256).

The potential irony of this scenario becomes apparent in the light of recent research on resource intensification. The food resources touted as "sheer bounty" in the Fagan description are identified by intensification researchers as the extended diet-breadth of a population reduced to a comparatively low level of foraging efficiency (Broughton 1994a, 1994b; Byrd *et al.* 1998; Raab 1996). This is a contrast that we might bear in mind in examining the argument that the prehistoric California landscape was effectively a vast horticultural production facility run by its human inhabitants, an idea inspired directly and primarily from readings of ethnohistoric information (Blackburn and Anderson 1993; King 1994).

Between eco-functionalism and resource intensification, we are presented with a polar choice of models: Cultural change driven by adaptive optimization versus change induced by a progressive loss of foraging efficiency. In terms of model-building, this binary opposition sets up a comparatively rare situation in archaeological research; i.e., where the test implications of competing theories are so divergent that empirical support for one theory effectively discounts the other. The result is a quasi-experimental research design for California archaeology that seems certain to launch robust debate and new research initiatives.

NEW APPROACHES TO ETHNOHISTORY

As we saw above, the Chumash area is a premier

locality where ethnohistorical interpretations are said by eco-functionalists to support their reconstructions of California prehistory. It would be wrong to conclude, however, that eco-functionalist scenarios, despite their long-standing popularity, are entirely characteristic of ethnohistoric model-building in this region. While the space available here is far too limited to engage a complete discussion of current ethnohistoric studies in this area (see Holmes and Johnson 1998), it is informative to consider briefly an example of model-building that departs from the eco-functionalist traditions described earlier.

Johnson (1998) identifies an intriguing post-marital residence pattern in Spanish mission records: After marriage, about 70 percent of Chumash men departed their natal localities to live in the communities of their wives. Unanticipated by previous ethnohistoric research on the Chumash, this is a pattern that points strongly to matrilocality at the time of European contact. More than merely a curiosity, Johnson goes on to point out that in cross-cultural surveys matrilocality is strongly correlated with certain patterns of warfare. The nub of this connection for many theorists is that, "Matrilocality prevents the creation of feuding residence groups of patrilineally related males and is therefore given a selective advantage under conditions of external aggression" (Johnson 1998:18). As Johnson (1998) points out, a matrilocality residence pattern is consistent with the fact that the ethnohistoric Chumash are nearly universally described as embroiled in relentless inter-village feuds and warfare (Lambert 1994; L. King 1982). But what conditions might have given rise to these patterns?

Constructing a model designed to tackle this question, Johnson (1998) assembles a range of archaeological data, including some of the evidence of paleoclimatic stress and resource intensification reviewed earlier. Johnson hypothesizes that the late Holocene Chumash area may have been stressful enough to engender chronic, violent competition for vital resources, and thus likely to produce matrilocality residence patterns. Johnson (1998) suggests that forms of social complexity and

economic exchange previously hypothesized for the Chumash area (e.g., Arnold 1992 and King 1990) might be expected to arise under these conditions as well. Addressing the latter possibilities, Johnson offers a statistical analysis of settlement networks, concluding that substantial evidence exists for the rise of a regional settlement hierarchy based on political influence.

While the merits of Johnson's approach will no doubt be debated, it clearly offers alternatives to the model-building tactics employed by eco-functionalists. For example, Johnson's efforts eschew explanation by ethnohistoric anecdotes and simplistic, direct-historical analogies. Instead, he marshals systematically collected and analyzed bodies of ethnohistoric and archaeological evidence, allowing each type of evidence an explicit, co-equal and analytically independent role in theory construction. Equally important, Johnson's arguments go beyond simply trying to tell us something about the prehistoric Chumash. This orientation does not, of course, diminish the value of understanding Chumash culture *per se*, but Johnson's efforts at model-building take on a greater significance in that they utilize Chumash data to illuminate some of the fundamental causes of variation in human social organization. This broadly comparative orientation stands in sharp contrast to eco-functionalist reconstructions which, as we have seen, frequently envision California as a special, if not unique, cultural province: hunter-gatherers in paradise. Here, we are presented with another clear distinction between the uses of ethnohistorical research in the hands of eco-functionalists, and a competing theoretical approach: While the former tends toward localized and particularizing explanations of culture change, Johnson seeks general anthropological relevance and nomothetic explanatory principles.

CONCLUSIONS

Recent advances in California archaeology have rendered the liabilities of eco-functionalism and its supporting ethnohistoric interpretations increasingly evident. While a number of criticisms could be leveled at this theoretical program, two problems stand out:

(1) The marriage of ethnohistory and eco-

functionalism provides an unrealistic basis for understanding prehistoric cultural patterns for a number of reasons. The idealist scenarios examined earlier, even if construed as historical reality, could not reasonably serve as analogies for the distant past unless we are willing to make patently unrealistic assumptions about the nature of culture change. Regardless of questions about cultural continuity across time, envisioning high states of adaptive success as the typical outcome of hunter-gatherer behavior offers an equally unrealistic basis for developing hypotheses about culture change. Specifically, this notion implies the dubious proposition that maladaptive or unsuccessful cultural patterns play no meaningful role in shaping cultural variability.

It makes no sense, of course, to replace cultural idealism with an opposite but equally skewed emphasis on cultural catastrophism. References to "epic droughts," "marine subsistence disaster," warfare, disease and other calamities clearly have a capacity for capturing the imagination, public and professional, in a way that many other aspects of archaeological research do not. Trigger (1989:319-326) may well be correct in arguing that contemporary America and Europe are primed to accept a "cataclysmic archaeology;" i.e., to embrace a disaster-prone prehistory that resonates with our own economic and social insecurities. In the sense that anthropological theories tend to arise in societal environments where they find receptive audiences, perhaps cataclysmic archaeology could achieve popularity in the same fashion as eco-functionalism. The lesson here is that we should be careful to distinguish theories that are useful to solving worthwhile scientific problems, and not merely popular. Just the same, it would be foolish to ignore increasing empirical evidence that less-than-optimal adaptations and stress-induced culture change significantly shaped prehistoric California.

(2) For anyone who supposes that ethnohistory automatically helps to inoculate archaeology against mechanistic determinism, it should be pointed out that the partnership of ethnohistory and eco-functionalism has made a form of environmental determinism not only

acceptable, but even fashionable. While suspicion of deterministic arguments based on limiting or stressful environmental forces reaches nearly phobic levels among archaeologists, an eco-functionalist Trojan horse has introduced benign environmental determinism into the midst of archaeology almost unnoticed. Examples abound. Fagan (1995:252-253) concludes that, "The Chumash achieved a level of social complexity that represents about the limit of such complexity possible without adopting agriculture," and that, "Like more complex hunter-gatherer societies elsewhere in North America... they were able to achieve this elaboration because of unusually favorable environmental circumstances." McCawley's (1996:111) recent synthesis of Gabrielino Indian culture reaches an almost identical conclusion, noting that the Gabrielino possessed, "an environment rich in natural resources." Chartkoff and Chartkoff (1984:148) cite a "unique combination of resources" that were, "capable of supporting large populations once the proper social and technological adjustments had been made to permit their intensive exploitation."

In all of these accounts is an inescapable implication that some kind of direct and deterministic link existed between a uniquely productive California natural environment and cultural progress. Perhaps the simplistic determinism featured in this scenario has generally evaded criticism because it envisions only successful and advanced cultural traits arising from culture-environment relations, not the negative or constraining impacts that many classically equate with environmental determinism. Apparently, many archaeologists and anthropologists have not grasped that unwarranted determinism is as likely to be conjured from images of plenty as from scarcity; in fact, given currently popular eco-functionalist biases, the determinism of environmental richness is probably a greater menace to a realistic understanding of prehistoric culture change in California than is any sort of catastrophist thinking.

Finally, and despite the criticisms leveled earlier in this discussion, the direction of future archaeological research in California should be viewed with optimism. With the enormous expansion of cultural resources management over the last two decades, questions have been raised about whether archaeology can yield authentic scientific progress or merely a massive accretion of "gray literature" (Martz 1993, Sutton 1993). For a time, regional research

designs appeared to be a promising mechanism for sustaining scientific creativity and growth. The institutional resources necessary to create such designs have never fully materialized, however, and it now seems that California archaeology will have to insure its intellectual survival along different lines. The proliferation of research models and attendant debates noted in this discussion are providing California archaeology with a powerful engine of scientific innovation. Debates have energized competing communities of researchers in a fashion quite at odds with a view of scholarship as a ponderously incremental, descriptive enterprise. Equally far-reaching is the ecumenical appetite for relevant data that has been created by a focus on model-building. What matters most are the problems under investigation, not whether these problems are attacked by contract or "pure" research. Increasingly, scientific problem-solving in CRM and academic research programs seem to be on convergent paths. The fact that these trends may lessen some of the traditional influences of ethnohistory on California archaeology seems a small price to pay for a dynamic research future.

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