

researcher's point of view. In a later section, Hyder presents *his* findings using all the available data, further refining the rock art site types and defining attributes as suggested by the study.

In the remaining sections the author furnishes an approach to rock art classification and then tests the results through seriation analysis of the rock art components. Preliminary data tend to support that there are differences in the rock art styles over time and between coastal and interior rock art sites. Hyder points out that seriation studies and diversity analysis are two approaches that have proven particularly useful to making sense of rock art data. He goes on to say that too few studies have been conducted to assess the contribution made by these approaches to archaeology.

More questions are raised than answered in this report. However, Hyder's approach to the data helps to clarify the known data and suggests future avenues of research. With the increase in data collection, better methods of recording, and improved statistical techniques, I too believe it will be possible to focus on whether artists favored painting specific images in specific colors and patterns in association with other archaeological features.

This paper probably is one of the most focused on rock art, yet it takes a holistic approach to the study that is both rewarding and refreshing. Hyder asks a number of relevant questions, attempting to integrate rock art data into the broader archaeological context. It is refreshing to see empirical data used to support and explore research and interpretation.

While discrepancies of interpretations are sure to arise in the defining of rock art element categories, Hyder has not only provided descriptions of the images but they *are* placed into motif categories and examples *are* illustrated. Without these supplemental data it would be impossible to disagree with

his decisions for placement.

The photography is excellent. However, on several figures (8, 9, and 11) where the painted images were weathered or superimposed it would have been helpful if drawings of the images had been included to better illustrate and distinguish them.



Craft Specialization in the Prehistoric Channel Islands, California. Jeanne E. Arnold.

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One of the more perplexing issues plaguing California prehistorians for several decades has been the problem of demonstrating sociopolitical complexity in the archaeological record. Extrapolating from ethnographic data salvaged since the turn of the century, archaeologists have sought time and again to expose buried evidence proving that native populations in the California culture area achieved levels of development normally thought linked with food-producing societies. Early attempts focused on mortuary data, often depending on nothing more than nonrandom distributions of apparent valuables. Many a prehistorian, myself included, has wanted to believe the political-economic implications of those patterns, yet single-dimension data do not instill the confidence necessary to embrace such bold propositions.

Active interest in this general issue had waned for a period of time after the early 1970s, but with publication of Koyama and Thomas' (1981) volume and Price and Brown's (1985) collection evaluating complexi-

ty in forager economies, concern with the California archaeological arena surfaced again. In conjunction with this re-emerging interest was the awareness that to address topics beyond so-called "simple" subsistence and settlement problems required a considerable array of information as well as a theoretical matrix with which to interpret those data. One of the most recent examples of this "enlightened" strategy is Jeanne Arnold's evaluation of the development of craft specialization in Channel Island prehistory, based on a revision of her Ph.D. dissertation (1983) and published in the University of California Publications in Anthropology series (1987). This study, representing a milestone in California prehistoric research, also is a landmark in the decades-long captivation with Chumash lifeways.

This monograph consists of seven chapters, each dealing with various issues concerning the emergence of specialized microblade production in Channel Island prehistory. In introductory comments, Arnold introduces her perspective on craft specialization, the origin of such specialization, the evolution of chiefdom-level societies, the rise of sociopolitical organizational structures in prehistoric Chumash society, and the critical role of craft specialization to those developments. The reader is presented with encapsulated views of specialization as a component of stratified societies (e.g., Sahlins 1958; Service 1962) and a precis of explanatory causal models arguing for variously prioritized trigger-mechanisms in the rise of chiefdoms. Arguments include those that enlist environmental diversity, social conscription, productive mobilization, subsistence and organizational stress, and "Marxist" scenarios. Discussion subsequently turns to a cursory review of primitive monies, as well as to examples of specialization in ethnographic contexts from the world and California.

In the final section of the second chapter, Arnold reassesses approaches to the affirmation of craft specialization in archaeological contexts and summarizes ten elements that she presents as pattern-markers for the identification of this economic phenomenon. This chapter is vital to Arnold's argument, and although summary treatments of numerous economic and archaeological topics are given, the reader does not advance to the next chapters with a coherent understanding of the author's own perspective of these problem domains.

The third chapter addresses the mechanics of microblade manufacture, principally in terms of definitions and descriptions of productive technology. At this point, Arnold introduces the reader to the type of lithic data she proposes to evaluate and distinguishes among the various core and microblade forms of interest. These are found in three blade types (according to cross section): (1) unprepared-trapezoidal, (2) unprepared-triangular, or (3) prepared-triangular. Arnold next establishes cost and efficiency parameters for associated production strategies, that are used primarily as measurement standards for evaluating data. She continues with a review of North American microblade industries, followed by explicit delineation of production parameters. In this instance, Arnold distinguishes those dimensional limits within which preferred microblades are generated. These restrictions are defined according to material constraints (e.g., most effective thickness for given hole size and anticipated torque required, as a principal use to which the blades were put was in bead drills) and are designed as those that reflect "intent" by the manufacturers. While the previous chapter is critical to interpretive context, these material parameters are those against which all core, blade, and drill measurements are evaluated and arguments for standardization formulated.

With the fourth chapter, Arnold begins her

evaluation of archaeological context. Reviewing the geology of mainland and island environments, she concludes that the availability of high quality chert sufficient to produce microblades on a large scale is restricted to the east side of Santa Cruz Island. The author then shifts abruptly to a review of quarry studies in the Americas to exhibit how one might obtain behavioral inferences from such data, and then returns to California ethnographic data for examples of resource-control strategies. Acknowledging the limitations of archaeological data, Arnold enlists those control behaviors as potential tactics to be recognized in her research program, and reverting to the quarries once again, she delineates eight separate avenues of inquiry to address these issues, none of which, she acknowledges, is sufficient individually to solve these problems.

In the fifth chapter the examination of data commences. The author establishes that the site of interest, SCrI-93, was occupied between A.D. 800-1150 and notes that approximately 60% of successful microblades in this site, and over 75% of all blades, are trapezoidal in cross-section. Evidence also indicates that 84% of the cores are multi-use and lack ridge preparation. She concludes that the overall success rate was relatively low, 40-44% among core measurements and even less among blades, although she also notes that most successful blades would have been removed from the site anyway. Consequently, these figures suggest to Arnold that blade production was somewhat standardized and had remained essentially unchanged over the duration of site occupation. Unspecified regional data indicate that cherts were removed from the quarries for blade production, and although residents accounted for 90% of production volume, Arnold also argues that they did not monopolize manufacturing processes and perhaps were in an incipient stage of specialization.

To contrast with the patterns disclosed for SCrI-93, Arnold enlists archaeological data from China Harbor, primarily that of SCrI-306. At this site, Arnold estimates a conservative figure for potential recovery, proposing a quantity of some 2.6 million blades and 0.5 million cores in the deposit. Given this density of artifacts and a production duration from about A.D. 1300 to 1785, she calculates a rate of manufacture on the order of 5,400 blades per year, an estimate based on rejected items. Blade and core configurations are different here as well as success rates. Cores have only 1-3 scars, 88% have prepared ridges, and these materials exhibit a success rate of approximately 70%. Prepared triangular blades account for 75% of the assemblage. Other data are cited to support this pattern and to document further the transition from one manufacturing technique to another. Substantiating the emergence of specialized production, the author also notes a near absence of bead manufacturing at this site.

Concluding this study, Arnold presents summary discussions of her previous chapters and submits these data to additional scrutiny in light of purported indicators of specialization. She argues that the transition of blade manufacturing distribution from an island-wide pattern to one tied closely to the northeast shore of the island marks the development of greater resource control as the industry became more specialized. In addition, the change from one blade/core form to a second that exhibits greater overall efficiency in terms of successful production demonstrates a focused and intentional effort to alter production strategies in a unidirectional manner. The product became more uniform, and requisite skills became more demanding.

Given these patterns, Arnold reiterates to the reader that such a portrayal of emerging specialization and political economic change

is best conceived in light of broad organization transformations. The author takes this step and in the context of greater Channel Island prehistory, she portrays fundamental cultural and economic change as a consequence of environmental variability, climatic fluctuations, changing population densities, and technological developments.

With these factors as background, she cites the plank canoe, limited chert resources, and restricted *Olivella* distributions as principal catalysts for the emergence of specialization in which both island and mainland populations participated. The historical trigger mechanism pushing these systems over the threshold is described as a climatic fluctuation during the period from A.D. 1100-1150, leading to an interval of serious subsistence stress. Unfortunately, the citation for this critical turning point is a "personal communication." With these changes, she continues, we also can expect dramatic increases in leadership roles and power, with greater control of money-making and other facets of exchange systems. A new relationship also materialized between islanders and mainlanders, as their relative functions became more specialized. Although this specific interaction arose quickly and spread widely, the arrival of metal needles and glass beads in the 18th century belied its fragile nature. This late introduction led to the rapid demise of this whole industry, not to mention associated lifeways.

Although perhaps not intended as such, these concluding comments by Arnold represent the primary thrust of this volume. They are a reminder of the intent of our inquiries and of those complications associated with successful achievement. In this vein, Arnold has made explicit that the integration of "craft specialization" with other facets of increasing political-economic development is so closely bound that one cannot be elucidated without understanding the other.

This, in fact, seems to be the prominent

obstacle which Arnold has attempted to overcome. While presenting a wide array of theoretical, archaeological, ethnographic, and environmental reviews, she never constructs a single formula to account for those abundant data she cites, much less for the political-economic evolution that is both the basis and the product of her research program.

Inasmuch as Arnold's research is focused on a single problem, the execution has not been easily accomplished. She depends on both ethnological precepts regarding stratified societies and ethnographic data from the Chumash to support and sometimes explain her statements and conclusions. Not that this method is necessarily bad, but what is needed to unify this approach are coherent portrayals of ranked and/or stratified societies and a theoretical basis through which to comprehend their evolution and integrate disparate data. The reader is given pieces and elements of such concepts, but they tend to be scattered throughout the volume and are difficult to coordinate.

On the positive side of this technique, however, is Arnold's use of history. In her search for evidence of craft specialization among hunter-gatherers, she examines archaeological patterns for behavioral transformations (or lack thereof) and subscribes to historical evidence to account for those. Although this tactic requires sometimes dubious ethnohistoric and archaeological data, it is essential to a full treatment of any given cultural record and is requisite to our exploration of California prehistory.

Unfortunately, Arnold does not do this process complete justice, in that her examination of Channel Islands populations, environment, etc., is truncated and the "explanatory trigger" is subsumed in a nonspecific personal reference. Additionally, the reader is left in doubt as to why a large, established, mainland population would voluntarily surrender control of an apparently vital economic resource (i.e.,

beads) to a smaller, weaker, and vulnerable island population. Certainly, varied explanations might be conscripted, but the author makes no attempt to document any such detail.

From a more narrow perspective, Arnold has expended considerable effort to demonstrate the existence of craft specialization in prehistory, and while one might take issue with certain minor points, her polythetic assault on these data secures the conclusion that such economic structures were present. Her effort is especially significant because detecting specialized behaviors among hunter-gatherer economies is particularly difficult. Most research examining these economic forms has been oriented toward higher-level stratified and state societies, where spatial segregation of economic tasks is better defined (although this is not always a guarantee, either). Arnold has configured an argument with more universal applicability and with more to offer the forager research domain.

The principal difficulty with this study, and that which induces its vulnerability, is its scope. Craft specialization on its own is a seemingly simple, straightforward focus, but once necessary corollary data are incorporated, the bounds begin to grow at an ever-increasing rate. Context is very important to the study of economic evolution, and if one is interested in monitoring a transition over that threshold to stratified complexity, context itself introduces whole new complexities. Even given these obstacles, Arnold has successfully accomplished her basic goal. Her study is an important advancement in western prehistory and sets the stage for subsequent work of equal stature. Any person interested in the evolution of California native societies, regardless of their provincial leanings, should examine this volume and appreciate its implications. The Anthropology Series at Berkeley has chosen well with this mono-

graph, and if the editors continue to publish such work (not to mention if scholars continue to write such pieces), California will once again have an important outlet for anthropological and archaeological investigations.

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Ishi: America's Last Stoneage Indian. Richard Burrill. Sacramento: The Anthro Company, 1990, vi + 50 pp., 36 figs., \$8.95 (paper).

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The tale of Ishi, last of the Yahi, who maintained a traditional lifestyle in the wilds of northern California into the 20th century, has reached its third generation of storytelling with this monograph. There was considerable hoopla with scientific and popular, often sensationalized, accounts regarding Ishi shortly after his transcendence into Euro-American culture beginning in 1911 and continuing for a period after his death in 1916. His dramatic story was revived with the immensely popular, sometimes romantic works of Theodora Kroeber (1961, 1964), an outgrowth of her marriage to A. L. Kroeber, one of Ishi's most trusted friends, and the