primarily on the reported distribution of ceramics in the region, the author concludes that they were not a single group (p. 245).

However, the report has some very serious deficiencies. For example, the grammar and syntax are often strange, and the format is sometimes difficult to follow because of the artifact tables (many with only one entry). The lithic analysis is truly strange. Thirty-four different kinds of stone are first identified (p. 17), and then abbreviated (p. 40) for use in the tables. But, the sources of most of the materials are not discussed and the artifact classification is naive, reflecting fundamental misconceptions about typology and lithic technology. There is an overemphasis on projectile points and bifaces, and some items are given very strange names (e.g., perforators and reamers are called "tip tools" and perforated discs are called "spindle whorls"). Furthermore, no attempt was made to relate the cores, retouched tools, and other worked pieces with the lithic debitage.

All of the analyses, including stone, bone, shell, soil, ceramics, flora, obsidian hydration, and radiocarbon, are shallow and simplistic. Settlement pattern analysis is limited to four site distribution maps (Figs. 107-110), and the site typology is illogical. Ignoring such factors as size, elevation, topography, geology, microclimates, and local environmental conditions, "Archaeological sites [were] separated into types by the range and number of artifacts and ecofacts found in them" (p. 13). Other than talking briefly about destroyed and missing sites, there is virtually no discussion of sampling strategy, sampling bias, or intra-site variability. Site dimensions were determined by surface distributions of (large) artifacts, and excavated soils were processed dry using 1/4-in. screen. A minimum of two column samples (15 cm. square) was removed from each site and processed using water and 1/8-in. mesh. Perhaps the most ridiculous statement in the entire report relates to the column samples. "The analysis of the column samples proves that, in this instance, small artifacts, flakes, and faunal remains were not being lost by using 1/4" screens in the field" (p. 17).

On the positive side, Coyote Press has provided readers with a fine example of "pre-processual archaeology." Cameron's report is another reflection of the appalling CRM policies and practices that characterize archaeology in Orange County, and much of southern California. The report is like root beer, some people like it, others do not. For some students and researchers working in southern California it may be a valuable addition to their libraries. But, for those who are seeking new ideas, or statistically significant data, it will be a disappointment. The author says it most succinctly: "This may be a beginners work" (p. 45).

A Taxonomic Analysis of Avian Faunal Remains from Three Sites in Marina Del Rey, Los Angeles County, California. Joan C. Brown. Coyote Press *Archives of California Prehistory* No. 30, vii + 71 pp., 8 tables, appendix, 1989, $6.20 (paper).

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Zooarchaeologists usually are pleased to see a contribution in their specialized field of interest. This is particularly true when it is a monograph length study of a fairly large collection of fauna. Avifauna are not commonly encountered in large numbers in faunal assemblages, but when they do occur, they are particularly useful for assessing seasonality and making other behavioral inferences. In addition, bird remains are relatively difficult to identify and often are

overlooked or ignored in faunal studies. For these reasons, both the author and Coyote Press are to be commended for their efforts in making these data available.

In this report, Brown provides a summary analysis of some 3,137 bird remains recovered from archaeological investigations at CA-LAN-59, CA-LAN-61A, and CA-LAN-61B, three sites located on the bluffs above Ballona Creek in Marina Del Rey. The report is divided into several sections. These include a brief introduction to the sites, a more lengthy discussion of the importance of birds (especially their plumage) to native Californians, a short description of certain artifacts from the sites which the author associates with the procurement and/or use of birds, a summary of ethnographic methods used to cook and to hunt birds, and a discussion section that presents the actual data from the sites and discusses analytical methods and certain other aspects of the faunal collection. Finally, there is an appendix consisting of a few ethological observations on each of the taxa recovered and a summary of elements represented for each taxon.

The main point Brown makes in this paper is that the collections contain a disproportionate number of coracoids, scapulae, and wing elements. Upon the basis of this evidence, Brown concludes birds were acquired primarily for their plumage and "the use of the birds as a food resource was of secondary importance" (p. 42). Furthermore, Brown asserts that the observed pattern of elemental frequencies "cannot be attributed to post-depositional attrition, nor to any archaeological sampling bias" (p. iii).

Due to my own interests in paleoecology, I read this report with optimism, but ultimately was disappointed with the overall product. There are a number of problems with this study; some of the most obvious will be outlined here.

To begin with, the title is incorrect and misleading. This is not a "taxonomic analysis" but simply a listing of species of avifauna found in these three sites. Most of the report involves the author's attempts to use the ethnographic record to substantiate her claims regarding the relative importance of feathers to California Indians.

The report also is organized in a confusing manner. For example, most of the section entitled "Artifacts from the Marina Del Rey Sites" has nothing to do with this topic. Instead, it primarily contains ethnographic descriptions of methods for procuring and cooking birds. One of the main themes within this study involved explaining various patterns evident in the frequency data concerning species and element representation at each of these sites. Yet potential sources for variation were not discussed in any systematic fashion, but instead occur as comments scattered throughout different parts of the manuscript. For instance, patterns of element representation are discussed in the section subtitled "Inter-Site Differences," but not considered to any extent in the section on "Element Bias." Similarly, stratigraphic issues are mentioned in several different places, but nowhere are they treated as an important topic bearing on the results of the analysis. This topic would have been better treated as a separate issue, since the rationale used for combining stratigraphic units is still unclear, especially when it is said in the same paragraph that at CA-LAN-59 neither strata B nor C "represent cultural strata" yet the quantity of cultural material differs and it is thought there "was archaeological significance to the different strata" (p. 2).

A sizable portion of the text is devoted to describing ethnographic use of avifauna by California Indians. Brown clearly is attempting to emphasize the importance of birds to native peoples by illustrating many of the ways and methods they were used. Apparently this is done principally to bolster her argument

that bias in body-part representation indicates the primary importance of birds as sources of plumage rather than as food. To do this she incorporates ethnographic and ethnohistoric evidence from many different cultures in various areas of California and elsewhere.

By itself, I have no problem with a synopsis of California Indian featherworking. However, Brown presents this information in a way that implies it is all directly applicable to the prehistoric inhabitants of these sites. For example, she cites an account by Pedro Fages of the use of bird skins for swaddling babies, only she neglects to point out that he was observing natives in the southern part of the San Francisco Bay when he made this observation. Brown cites many behaviors of other peoples as though they can be indiscriminately applied to the Gabrielino and their ancestors. Although the ethnographic record is inconsistent in detail and lacking in many respects, it is inappropriate to simply fill in the blanks as she has done in many places in this report. In one instance, she describes the importance of feathered baskets in California citing examples from many different areas. However, she neglects to point out these are not documented in the region where these sites are located. This type of misuse of ethnography is continued in the section devoted to describing methods for procuring birds. Here she describes in some detail the pigeon blinds of the Yokuts or the quail snares of the Miwok as though these contrivances were universally utilized. Other misleading ethnographic examples could be cited here as well.

Brown's conclusions in this study are based on observations regarding certain biases in body part representation both within and between species. Her interpretations, however, are in my opinion not substantiated by the data she cites but instead by faulty reasoning. She states that discrepancies in elemental representation "cannot be attributed to post-depositional attrition" (p. iii), yet her evidence for this conclusion is founded in a confused understanding of bone density differentials and the effects of these on bone frequency representations in archaeological sites. Brown (p. 31) reasons, "If entire birds were deposited on the sites, the skeletal remains should represent a more equal distribution of the elements." She discounts differential durability in skeletal parts as a factor since "the ends (epiphyses) of the long bones should have similar rates of preservation and that preservation should affect all of the species to a similar degree because of the similarity of size and bone density" (p. 31). Later she says, "The density of these bones would not have varied to a great extent because the majority of the species represented were of similar size and form" (p. 41). Quite simply, Brown is incorrect. The very paper she cites in support of her contentions (Binford and Bertram 1977) is a study detailing precisely how different skeletal elements will survive attritional processes differentially upon the basis of their density. Some elements are quantitatively more dense than others, and in avian species these include precisely the elements found in highest frequencies in Brown's analysis.

A second factor she has not considered is that certain elements are more useful for identifying taxa than are others. One of these elements in birds is the coracoid, the most frequently identified element in her study. I would argue that body part representation in these sites is most parsimoniously explained as a product of differential survivorship due to attritional processes. A reasonable alternate hypothesis would suggest relatively high frequencies of breast and primary wing elements may be related to the fact that these represent some of the meatier portions of birds. These data can be interpreted as evidence for the dietary importance of birds at these sites. Furthermore, I would suggest

it is likely that few species were hunted exclusively or primarily for their plumage. Modern ethnocentric assertions about "palatability" (pgs. 25-26, 30) of different bird species probably have little relevance to the dietary behaviors of aboriginal peoples.

The major criticisms I have with this study are not with Brown's attempts to fit her analytical results with her preconceived beliefs about the relative value of bird feathers. Instead, it is disappointing to find she has precluded any serious treatment of important theoretical issues for which the data are relevant, and because she neglected to include much of the raw data generated from the study so that other researchers could investigate such topics.

Brown indicates (p. 33) that data collected for each element included "area of recovery, the unit and level from which it was excavated, the species (or nearest identification), the element itself, whether it was a left or a right, the portion of that element, if it had been exposed to fire and to what extent." Also she states, "This information was fed into a computer program for statistics (SSPS) and a cross comparison made between areas, levels, species, elements, etc." (p. 33). Unfortunately, this report contains little of this information. Instead, it is limited to summary statements such as "It was found that distribution throughout the sites followed the same pattern as that of other artifactual material" (p. 33), or "that the small amount of information gained would not warrant the time required to further the MNI count on the basis of stratigraphy" (p. 31). These observations contradict obvious patterns evident in differences between species found at different sites and the suggestion the data are in a computer program that should allow them to be sorted rapidly. Brown is clearly intent on convincing the reader that feathers are more important than food. She appears to care less about what these data tell us about changes in species use through time, variability in land use patterns, or other ecological issues.

Brown does briefly mention the seasonal implications of the species represented and concludes these data indicate habitation during the winter months. Again, her reasoning is rather weak. She supports this argument on comparisons between the archaeofaunas and a modern study of birds in the Ballona Marsh area. In her interpretation, she has made a common but hazardous assumption that the dynamics of modern bird populations reflect prehistoric conditions. In fact, there is considerable evidence to suggest this probably is not the case for a variety of reasons (cf. Grayson 1984:174-177).

Overall this work represents a poor piece of scholarship with limited utility to other researchers. Brown would have done a better job had she developed some relevant research problems prior to conducting this study rather than simply quantifying the faunal data and then looking for some pattern that supported her *a priori* beliefs about how birds were used by the aboriginal populations of California. Authors of specialized studies such as this should realize that the primary audience for such literature is other specialists in the same field, and these individuals generally are going to be more concerned with seeing actual data than they are with the interpretations or opinions of the author. This is the case with monographs in particular. Brown could have published her interpretations in a much shorter article and reserved this format for presenting data that would have been of more use to others in this field. The sample of avifaunal remains from these sites is one of the largest such assemblages yet recovered from archaeological contexts in California. It is indeed disappointing that this report does not present more of the specific data Brown states (p. 33) she compiled in the course of her analysis. It is apparent from both the

diversity of species identified and the magnitude of the samples involved that she put a considerable amount of time and effort into this project. Unfortunately, the end product does not justify the endeavor.

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Rock Art and Archaeology in Santa Barbara County, California. William D. Hyder. San Luis Obispo County Archaeological Society *Occasional Paper* No. 13, 1989, 50 pp., 17 figures, 8 tables, no price listed.

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Hyder sets out to conduct an ambitious project and succeeds in examining the functional, chronological, and regional dimensions of Chumash rock art. Earlier investigators have analyzed only small numbers of rock art sites or have attempted to rely solely upon the ethnographic record for interpretation. Based upon the ethnographic literature, other Chumash rock art investigators have suggested that the rock art was produced by a ritual cult, the *'antap*, and therefore, was "ceremonial" in nature. The rituals allegedly focussed primarily on maintaining the sacred and cosmic balance or were connected with the acquisition of power. Little provision has been given by previous investigators for rock art to serve alternate explanations or have served multiple functions in Chumash culture.

Hyder notes that "The most productive studies focus on basic archaeological data: site distributions, environmental associations, site characteristics, chronology, and classification studies" (p. 1). However basic this idea, until recently few studies have considered rock art data in their broader archaeological context. Consequently, there have been few data from which to draw without conducting primary research.

The paper is well organized into sections that begin with "Three Dimensions of Chumash Rock Art." In this section discussions are presented on specific areas of past research. A good review is presented of earlier models. The three primary research questions are: Are Chumash rock art sites primarily ceremonial sites? What is the time depth of the rock art in the recognized Chumash territory? Can regional rock art substyles be detected by image distribution, and have the styles changed over time?

The next section presents a comparison of two rock art study areas. Data for these comparisons were accumulated by several investigators over the last 30 years. The two study areas represent rock art of a densely populated coastal strip (San Marcos Pass Study Area) and a much less densely populated interior region (Sierra Madre Ridge Study Area). The geography, elevation, and geology offer distinctly different environments in the two areas.

Twenty-eight rock art sites are included in Hyder's study. In the "Functional Analysis" section are further discussions on site classification as presented by earlier investigators. All sites are grouped by the presence or absence of midden and/or milling features as either occupation sites, limited activity camps, or limited activity sites. A summation is provided on the division of rock art sites being either public or private based upon the