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***Bioarchaeology of the Stillwater Marsh: Prehistoric Human Adaptation in the Western Great Basin.*** Clark Spencer Larsen and Robert L. Kelly, with contributions by Robert L. Bettinger, Dale L. Hutchinson, Frederika A. Kaestle, Joanna E. Lambert, Becky K. Rolfs, Christopher B. Ruff, Katherine F. Russell, Margaret J. Schoeninger, and David Glenn Smith. American Museum of Natural History Anthropological Papers 77, 1995, 170 pp., 42 figs., 47 tables, 2 appendices, \$20.50 (paper).

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I enjoyed this thought-provoking collection of papers on the bioarchaeology of the Stillwater Marsh. As a volume, it offers new insights into Great Basin population biology and introduces new elements into the theoretical equations of the region. Although the samples are at times rather small and not necessarily contemporaneous, this does not appear to seriously compromise the analyses described in the various papers. The volume is not, nor does it claim to be, a comprehensive treatise on the bioarchaeology of the Great Basin or even of the Stillwater Marsh. Rather, it is a tidy, readable collection of papers addressing several of the fundamental theoretical issues that drive Great Basin research. Despite the few problems described below, it is a volume that scholars and students interested in North American prehistory and human biocultural adaptation should have on their shelves.

It is unfortunate that my greatest concerns pertain to the first chapter, because this results in a negative beginning to an otherwise positive review. Kelly begins by setting out the goals of the volume: (1) to provide the reader with primary data on this rare collection of human skeletal remains; (2) to determine the environmental

constraints or conditions under which the prehistoric population lived; and (3) to address the issue of mobility as it pertains to prehistoric subsistence. I would add to these a fourth, that of addressing the cultural history of this region as it pertains to the timing and nature of the Numic spread. Kelly provides a very (perhaps too) thorough overview of the ecology of this region and of the two economic models that have been proposed to explain human adaptation to this desert environment. One of my main criticisms of this chapter is that Kelly does not develop the bioarchaeological implications of these different theoretical models. He also fails to elaborate on the debate over the Numic spread, a central issue in Great Basin prehistory (e.g., Madsen and Rhode 1994) and one that is specifically addressed in two chapters. Further, he devotes less than half a page to introducing the various contributions to the volume. The placement of this paper at the start of the volume necessitates its role as an introduction, and in this role it fails.

Things get back on track with Larsen's descriptive chapter (No. 2) on the historical context, composition, and characteristics of the skeletal sample. All of the analytical studies in the volume are based on two collections. The first was made in 1985 and 1986 by the Nevada State Museum in response to flooding and subsequent floodwater retreat in the Carson Sink. Related destruction in 1986 and 1987 resulted in a second recovery project in 1987 under the direction of Kelly and Larsen, with the express purpose of retrieving exposed and endangered archaeological human remains. The two collections are obviously complementary and together provide a much more statistically viable sample from which to draw conclusions.

The human remains recovered during the 1987 field season are described in detail in Chapter 3, by Larsen, Russell, and Hutchinson. This chapter is useful for understanding the nature and condition of the Stillwater Marsh skele-

tal materials. To me, it seems a bit of a digression placed as it is after the synthetic chapter, and I think it would have fared better had it preceded this. Alternately, it would have done well as an appendix, although several undergraduate students I asked to read the volume found it useful for visualizing the materials before moving on to the analytical chapters.

Innovative explorations of the origins and antiquity of the Numic occupation of the northern Great Basin are the subject of the next two chapters. Both provide a good overview of the methods, intentions, potential, and current limitations of human paleogenetic studies without bogging the reader down with unnecessary methodological details. In Chapter 4, Smith, Bettinger, and Rolfs describe their search for rare forms of albumin in noncollagenous serum protein extracted from the bones of 27 individuals. Because these rare albumin variants are specific in type and frequency to different ethnic or language groups, they can be used to explore possible ancestor-descendant relationships of the Stillwater Marsh sample. Using this technique, the authors eliminate a number of modern populations, including California Penutian, Na-Dene, and Washoe, from reasonable consideration in the ancestry of the Stillwater Marsh skeletal sample, and detect a possible affiliation with Yuman or Southern Uto-Aztecan groups.

In Chapter 5, Kaestle concurs with these findings but also eliminates Yuman and Southern Uto-Aztecan groups as likely descendants based on her analysis of mitochondrial DNA from the same 27 individuals. Using the frequency of a 9-basepair deletion known to vary among modern Native American groups as the basis for inferring relatedness, Kaestle finds that California Salinan-Seri speakers and Northern Uto-Aztecan groups more closely resemble the Stillwater Marsh sample than any other western populations. Although neither of these molecular studies is able to eliminate modern Numic speakers as possible descendants of the Stillwater Marsh

sample, they nonetheless greatly narrow the field of possibilities.

The next two chapters appeal to the more traditional but very effective methods of assessing the adequacy and composition of the diet. In Chapter 6, Hutchinson and Larsen take on the problem of dietary sufficiency by examining the frequency and severity of enamel defects in tooth crowns. Although noting that infectious disease is another important cause of these dental defects, the authors make a reasonable argument for the importance of dietary stress in the etiology of enamel hypoplasia in this case based on the low overall frequency of bone lesions attributable to systemic infection in the Stillwater Marsh sample. The authors then give the reader some perspective on relative health by contrasting these data with data obtained from the teeth of Georgia coast foragers and farmers. These comparisons reveal that physiological stressors such as infectious disease and malnutrition, while present, were not as severe in Stillwater Marsh populations as they were in prehistoric peoples of coastal Georgia.

In Chapter 7, Schoeninger appeals to stable carbon and nitrogen isotopic evidence to address questions of resource use and procurement as they pertain to the different models of mobility. Her sample of 39 individuals reveals a lack of obvious patterning in the isotopic values by age, sex, or temporal affiliation. Although her isotopic data do not refute a model of year-round marsh occupation, they do suggest that some Stillwater Marsh inhabitants were more dependent than others on upland resources—perhaps in times of cyclical lows in marsh botanical and faunal communities.

The final analytic paper by Larsen, Ruff, and Kelly (Chapter 8) brings two very different lines of osteological evidence to bear on the question of mobility. Noting an impressive body of literature that correlates excessive mechanical loading of articular joints with bone remodeling, the authors argue that the frequency and severity of

joint lesions can provide a useful measure of mobility. Comparing the frequency and severity of these lesions in different populations, they find that individuals from the Stillwater Marsh sample exhibit higher frequencies of joint remodeling than do East Coast hunter-gatherers or sedentary agriculturalists, findings they argue are more consistent with a physically demanding lifestyle than with the effects of parasitic mycotoxins, as has previously been argued by Brooks et al. (1990) for this sample. Sex differences in the severity of osteoarthritis in the hip and ankle joints are interpreted to be evidence of the greater mobility of males, a pattern consistent with the pursuit of game in upland regions. The evidence the authors present from the study of long bone morphology supports these interpretations. Because the distribution of osseous tissues in the long bones corresponds with the forces placed on bones during life, the cross-sectional properties of long bones can reveal habitual activities such as heavy lifting and long-distance walking. The results of this analysis are consistent with the data on osteoarthritis: both sexes appear to have been fairly mobile, with males more so than females. As the authors note, these sex differences in mobility call into question the simple dichotomy portrayed by the two models generally invoked to explain human adaptation to this region. The cross-sectional properties of these long bones also reveal evidence of excessive bone loss in both sexes that ties in nicely with the dental evidence of episodic undernutrition presented by Hutchinson and Larsen in Chapter 6.

The volume concludes with a short and concise summary by Larsen and Kelly (Chapter 9) synthesizing the data and interpretations presented in the various papers. Two short appendices provide additional descriptive data on various aspects of the collection. Overall, this is a nice, well-written volume that would serve well as a supplemental or case study text for classes in North American archaeology, Great Basin

prehistory, human osteology, and human ecology. The primary data presented throughout the text also make it a valuable reference source for regional archaeologists, bioarchaeologists, and others interested in human adaptation to this unique desert-wetland environment.

## REFERENCES

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Some books we read for sheer pleasure, others for professional consumption, and still others we hold as long-standing references.