BOOK REVIEWS

The Obsidian Cliff Plateau Prehistoric Lithic Source, Yellowstone National Park, Wyoming. By LESLIE B. DAVIS, STEPHEN A. AABERG, and JAMES G. SCHMITT. Selections from the Division of Cultural Resources, Rocky Mountain Region, National Park Service No. 6. Denver, CO. 1995. xii + 164 pp., photographs, figures, tables, appendices. No price given (paper).

Obsidian Cliff is arguably one of North America's most spectacular archaeological sites, steeped deeply in myth and scientific inquiry spanning the period from the earliest Euroamerican ventures into the interior West up to modern times. Obsidian Cliff also had the dubious honor of being perhaps the most "studied" lithic source in the country that was never systematically surveyed—that is, until 1988, when Leslie Davis of Montana State University's (MSU) Museum of the Rockies in Bozeman was contracted by the National Park Service to document Obsidian Cliff in support of its nomination to the National Register of Historic Places. The 1988 Wolf Lake Fire engulfed the area, almost completely burning off the dense ground cover and doghair lodgepole pine that previously obscured the archaeological deposits and features. While fieldwork was postponed for a year, the fire increased visibility substantially. In 1989 field survey of Obsidian Cliff began under Davis's direction. Stephen Aaberg served as field director.

Davis authored three of the five chapters, with Aaberg describing field methodology and results. James Schmitt discusses the geology and petrology. (Ann Johnson is listed on the cover as a co-author, but this is a typographical error; Johnson initiated and ably facilitated the project as the National Park Service coordinator. A correct list of the authors is presented on the inside cover and title page.)

The first chapter, "Obsidian Cliff Plateau Research Domains and Current Status," provides a historic overview. Bureau of Ethnology archaeologist William Henry Holmes was the first to publish a description of Obsidian Cliff. Holmes's 1879 report is reproduced in its entirety. Other early descriptions were provided by Phileteus Norris, Yellowstone National Park's first superintendent. A humerous account retold by Hiram Chittenden relates how the mountain man Jim Bridger repeatedly shot at, but failed to kill, an elk shot near Obsidian Cliff. According to the legend, Bridger was actually firing at an elk hundreds of yards away that had been "telescoped" by the "mountain of perfectly transparent glass" (p. 4). Davis also provides a history of intellectual speculation on the significance of this obsidian source and its role in trade networks, a brief discussion of the region's cultural chronology and settlement-subsistence systems, and some musings on the role of obsidian in the larger procurement system. Unfortunately, Davis does not present a formal model of obsidian procurement within the hunter-gatherer system. Impacts (e.g., road construction) to the integrity of Obsidian Cliff are also discussed. Two early photos by F. Jay Haines (1884) are reproduced in this chapter and attest the changes in toe slope of the escarpment over the past century. A geologic map of Yellowstone National Park and vicinity is presented; however, no legend is provided.

Chapter 2, by MSU geologist James G. Schmitt, considers the geology and petrology of Obsidian Cliff within the context of the geology of the Yellowstone Plateau. This chapter begins with a lengthy quotation from Joseph P. Iddings of the U.S. Geological Survey—the first geologist to extensively study Yellowstone National Park. Obsidian Cliff represents the remnant of one of four post-caldera rhyolitic flows defined as the Roaring Mountain Member of the Plateau Rhyolite. Post-caldera flows are described as those which occurred outside of and postdating the collapse of the Yellowstone Caldera. Schmitt places this event at

600 ka, but more recent K/Ar dating pushes this event further back in time to about 650 ka. The Obsidian Cliff event occurred at about 183 ka and has since been subjected to erosion and at least two episodes of glaciation, not to mention untold numbers of forest fires. Schmitt provides a good overview of the geological history of the area, as well as useful information on how obsidian forms and the process of hydration, which thanks to research by Irving Friedman and Robert Smith allows us to calculate the age of obsidian artifacts. Two plates from Iddings' original report (1888) are reproduced in this chapter and provide excellent illustrations of the columnar structure of the southern end of the escarpment. The chapter also contains a map of the Quaternary rhyolite flows of the Yellowstone Plateau. The caption to this map notes that these flows potentially contain obsidian. While this may be true, it gives the impression that numerous sources of obsidian are available, when many are of inferior quality for tool production.

In Chapter 3, Stephen Aaberg describes the results of the fieldwork. Based on their observations, over 90% of the Obsidian Cliff Plateau was burned by the 1988 fire, which facilitated surface inspection but severely impacted the cultural deposits. The fieldwork was not designed to be intensive, but "to locate the most salient archeological features resulting from the prehistoric human procurement of volcanic glass" (p. 27). Using a "flexible, transect-type of foot reconnaissance" the field crew was able to adjust the spacing of transects in response to changes in terrain while never exceeding 100 m between crew members. Approximately 10 km^2 (69%) of the flow was inspected, resulting in the identification of 59 prehistoric loci. The extent of each loci was determined and plotted on the USGS 7.5 minute Obsidian Cliff topographic quadrangle. Appendices A-C contain summary tables of the 59 loci. A reproduction of the map would be useful; but its exclusion may be prudent, considering the accessibility of the monograph.

Chapter 3 also contains an extensive overview of the fire history of Yellowstone. Aaberg discusses the impact of different fire intensities on the cultural deposits, either through direct thermal impact to the obsidian or via erosional transport (Appendix B). While not a specific criticism of this study, I would argue that future studies of fire impacts to cultural deposits investigate the processes of thermal alteration in a systematic, problem-oriented fashion. For example, we know not to use oxidized artifacts for obsidian hydration dating, but how can we distinguish more subtle effects of heating on hydration rates? The literature on the physics of fire should be thoughtfully applied to the archaeological record, particularly since new studies show that thermal alteration is not restricted to surface features, but can affect buried deposits as well.

There are a few instances in this chapter where terminology is used incorrectly. For example, the Crystal Springs flow (p. 27) is referred to as a vitrophyre flow, when in fact it is actually a rhyolite flow. In the same paragraph, the term *ignimbrite* is also used to describe the Crystal Springs flow. To clarify, rhyolite represents a group of extrusive igneous rocks that have evidence of flow structures, while ignimbrites are rocks formed by the deposition and consolidation of ash flows. Rhyolites are porphyritic igneous rocks that have a glassy groundmass. In fact, there are instances of vitrophyres being present in ignimbrites, but not all vitrophyres are ignimbrites. These terms are not interchangeable.

Chapter 4, "Cultural Utilization and Redistribution of Obsidian Cliff Plateau Obsidian," written by Davis, begins with a brief discussion of the archaeological importance of quarry sites. Probably the most important parts of this chapter, and possibly of the volume, are the results of the geochemical analysis of specimens collected from Obsidian Cliff and a review of previous studies of obsidian characterization and redistribution.

Appendix D presents the results of Richard Hughes' non-destructive X-ray fluorescence (xrf) analysis of 80 geological and archaeological specimens collected from the surface of Obsidian Cliff. The xrf data clearly demonstrate the geochemical integrity of the Obsidian Cliff geologic source. (Appendices G and H provide non-xrf geochemical profiles of Obsidian Cliff.)

Seventy-seven obsidian specimens from controlled contexts in Montana archaeological sites were analyzed for this study using xrf. Results from another 193 obsidian specimens from Montana are also reported; however, provenience in-

formation for this sample is not as good. The data (reproduced in Appendix E) show an unexpected result in the apparent preference for Bear Gulch, Idaho obsidian over Obsidian Cliff obsidian. Davis discusses the differential distribution of obsidians, based on these (and other) data, which "suggest that the respective obsidians were use relocated and/or exchanged via different routes" (p. 51). While a cultural mechanism for these patterns is left unexplained at this time, it is clear that obsidians were highly sought by Northern Rockies and Northern Plains groups.

My one criticism of this synthesis is the uncritical acceptance of the various data by Davis, especially considering the numerous techniques used and the three decades of time encompassed by these studies. In recent articles (1984, "Obsidian Source Studies in the Great Basin: Problems and Prospects," in: *Obsidian Studies in the Great Basin*, edited by R. E. Hughes, Contributions of the University of California Archeological Research Facility No. 45; and 1997, "On Reliability, Validity and Scale in Obsidian Sourcing," in: *Unit Issues in Archeology: Measuring Time, Space, and Material*, edited by A. F. Ramenofsky and A. Steffen, University of Utah Press), Hughes critically evaluates the various techniques used in the geochemical analysis of obsidian by archaeologists, arguing that some studies are irreproducible due to the lack of standards in machine calibration and the reporting of results in non-standardized units of measurement.

The final chapter provides support for the inclusion of Obsidian Cliff to the National Register of Historic Landmarks. Davis develops a strong argument based upon nearly 11,500 years of use by native groups and the widespread distribution of its obsidian across the continent for utilitarian and ceremonial purposes. Obsidian from Obsidian Cliff was also instrumental in the development and application of the obsidian hydration dating technique. In Davis' words, "The Obsidian Cliff plateau is of exceptional importance for understanding the dynamics of prehistoric hunter-gatherer lithic procurement, production, utilization, and trade/exchange systems and patterns in western interior North America and interregionally" (p. 67). The National Register selection committee concurred, and Obsidian Cliff became a National Historic Landmark on 16 June 1996.

The final chapter lacks a discussion of future research. Despite this and other minor criticisms, the volume represents an invaluable reference on Obsidian Cliff. The authors, fieldworkers, and supporting agencies should be commended for their work.

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Presenting the Past to the Public: Digging for Truths. Edited by JOHN H. JAMESON, JR. Altamira Press, Walnut Creek, CA. 288 pp., acknowledgments, foreword, illustrations, photographs, index. $49.00 (cloth, ISBN 0-7619-8908-0), $24.95 (paper, ISBN 0-7619-8909-9).

So you want to tell people about archaeology—how it works and what it can tell us. And you certainly want to explain how people lived long ago. That should be pretty easy, right? There are lots of things that you could do: invite the public to tour a site excavation, design new exhibits, or show a few slides in a local classroom. All great ideas, but hold on just a minute. Your heart is certainly in the right place, but the art and science of presenting the past to the public has grown markedly in the last few years and you would do well to check out some of the latest literature on the subject. *Presenting the Past to the Public: Digging for Truths* is the most recent book to appear.

Editor John H. Jameson, Jr. and a long list of contributors lead the reader through public interpretation, its philosophical tenets, integration into archaeological research, successful projects and programs, and potential hazards. The reader quickly learns that presenting history and archaeology to the public is not as simple as it may seem and "how we involve the public in the rich fabric of the American experience is one of our great challenges as we enter the 21st century" (p. 9).

The public is entitled to know about the past and archaeologists are obligated to share what we