N E V A D A A R C H A E O L O G I S T

VOLUME 27, 2014 A LOOK BACK AT THE *NEVADA ARCHAEOLOGIST*

NEVADA ARCHAEOLOGICAL ASSOCIATION

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Nevada Archaeological Association

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The purpose of the NAA is to preserve Nevada's antiquities, encourage the study of archaeology, and to educate the public to the aims of archaeological research. Members and chapters of the NAA shall:

1. Uphold the purpose and intent of the NAA.
2. Adhere to all antiquities laws.
3. Seek the advice, consent, and assistance of professionals in archaeology and/or history in dealing with artifacts, sites, and other materials relating to antiquities.
4. Assist professionals and educators in accomplishing the objectives of the NAA.
5. Be a personal envoy of the NAA and responsible for conducting themselves in a manner so as to protect the integrity of artifacts, sites, or other materials.

Cover

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Editor's Corner

Geoff Smith

Welcome to the latest edition of the *Nevada Archaeologist*, whose completion was greatly aided by NAA President Jeff Wedding. This is the last volume for which I will serve as editor for the foreseeable future: work and my growing family have taken up most of my time and unfortunately I am unable to continue to devote the time required to produce the journal each fall. I am happy to report that the journal will be in good hands moving forward: Craig Hauer has graciously agreed to take over as editor and will hopefully continue to deliver it on time each year.

I have throughout enjoyed my time as editor and hope that you have enjoyed the volumes I have edited over the past few years (2007 and 2011-14). I have met a number of great people, either in person or via email while formatting submissions, and am proud of the fact that several undergraduate and graduate students published their first papers in the *Nevada Archaeologist* during my time as editor. Many of those folks are now active in the local CRM community or have gone on to pursue additional graduate studies.

As you may have already noticed by glancing at the Table of Contents, Volume 27 is different than previous editions. This year, Nevada celebrates its 150th (i.e., sesquicentennial) anniversary of statehood. As such, we decided that a retrospective issue would be cool – one that features a foreword by longtime and notable Nevada archaeologist Bob Elston, the 2014 recipient of the NAA's Silver Trowel Award.

I selected papers from previous volumes spanning the past 40+ years, beginning with the very first paper to appear in the journal (Volume 1, Number 1, 1972), authored by Mary Rusco. In choosing papers, I attempted to select a wide range of articles that: (1) captured the diverse interests of both authors and audience – in essence, what makes Nevada archaeology so great; (2) highlighted the work of longtime contributors to our field, some of whom are no longer with us; and (3) did not appear in more recent volumes (i.e., post-2007).

In addition to Rusco's (1972) article, which describes an early cooperative effort between a utility company and archaeologists to mitigate the impact of a proposed telephone line (remember those?; now we survey for cell phone towers!) in the Black Rock Desert, this edition also features a short paper about the Black Rock Desert Mammoth by Betty Stout (1986) and Handprint Cave by Ruth Gruhn and Alan Bryan (1988) – two other notable discoveries in northwest Nevada. Donald Tuohy's paper (1981) ponders the enigmatic pebble mounds of Churchill County, a topic on which Stearns and McLane (2007) also focused in their paper published 26 years later and (also see Amy Dansie's [1981] and Ruth Musser-Lopez's [2013] papers on the pebble mounds, which both appeared in past editions of the *Nevada Archaeologist*). Kevin

Rafferty's (1990) article represents a response to a 1988 survey conducted by the Society for American Archaeology in which many respondents expressed a distain for CRM archaeology. In it, he argues that CRM plays a critical role in supporting academic archaeology. Hopefully, the rift between the various kinds of archaeologists is no longer what it once was. James D'Angelo's (1993) paper highlights the complex waterworks associated with a railroad near Argenta, Nevada. Dave Valentine (1996) discusses remaining evidence of the early transcontinental airmail route in Nevada. Alanah Woody and colleagues' (2001) paper describes the early efforts to systematically record Nevada's rock art, which was at that time and is today under threat from urban expansion and increased visitation. Finally, as noted above, Stearns and McLane's (2007) paper reconsiders the pebble mounds of Churchill County.

In looking through the past volumes, I was struck by a few things that I hope are apparent as you read this year's edition. First, the archaeological record of Nevada is diverse and complex, ranging from evidence of the first visitors to North America to Euro-American exploration, settlement, and transportation during more recent times. There is a seemingly endless list of potential research topics, many of which remain understudied despite the fact that archaeology has been conducted in the state for almost a century.

Second, those who study Nevada archaeology are an equally diverse group: past and present contributors to the journal include CRM workers, students and faculty from Nevada's colleges and universities, federal and state land managers, and avocational archaeologists involved in the field for the pure joy of learning about the past.

Finally, the *Nevada Archaeologist* has come a long way since it was first published in 1972. Although there have been a few hiccups along the way, in general the volumes have become larger and filled with a higher quantity and quality of papers. This is due almost completely to the efforts and interests of NAA members, who took time out of their busy lives to craft articles that detail some aspect of our state's cultural resources. Without such contributions, there would be no *Nevada Archaeologist*, and perhaps no NAA. This is <u>your</u> journal, and moving forward, I sincerely hope that you will consider sharing your thoughts and ideas about Nevada archaeology or highlights from recent fieldwork in this journal.

In closing, I want to again thank the authors, reviewers, and everyone who helped to make the past few volumes of the *Nevada Archaeologist* a reality. I look forward to continuing to be a part of the NAA for years to come and hope to see everyone at the next annual meeting. In the meantime, get out there and enjoy Nevada!

GMS
November 11, 2014
Reno, Nevada

Foreword

Robert G. Elston

It is with a lot of satisfaction that I write this forward commemorating the 42 years of *Nevada Archaeologist* (*NA*) publication.

I was a founding member of the Nevada Archaeological Association, and our goal for the organization was to provide a vehicle on which all those with curiosity about Nevada archaeology, (avocational, professional, or just plain interested), could ride. Thus, the very first number of *NA* contained articles by both professional and amateur archaeologists reporting on archaeological projects crewed by both professionals and amateurs. Early on the professional archaeologists tended to be associated with UNR, UNLV, the Nevada State Museum, or the Nevada Archeological Survey, and the avocationals with AmArcs or Archaeo-Nevada. Since then, formation of the Southern Nevada Rock Art Association and the Nevada Rock Art Foundation have provided more opportunities for people interested in Nevada prehistory to participate in its interpretation and preservation.

However, in looking over all the published issues I notice that beginning in the late 1980s, most of the articles in *NA* have been written by professional archaeologists working in a university, state or federal agency, or consulting firm, and most of the projects reported are done in the name of cultural resource management (CRM). I think it is great that *NA* gets so much professional attention, but in the future I hope we can find ways to encourage more of the amateur and avocational archaeologists to publish here.

With a few hesitations over the decades, *NA* has continued to publish articles on a wide variety of archaeological topics: Clovis points, railroad grades and other historic sites, fishing spears and sinkers, historic personal hygiene implements, mammoth skeletons, incised stones, historic cemeteries, lithic technology, pebble mounds, projectile points, and much more. This long series of publications is a record of what Nevada archaeologists were interested in and how they approached a variety of problems, very nicely reflected in the selection of articles for this retrospective volume.

How Much is History Worth?

Mary K. Rusco
Originally published in *Nevada Archaeologist* 1(1) (1972).

How Much is History Worth?

To the Bell System, preserving part of Nevada's irretrievable past is worth $16,000.

That's how much America's biggest telephone company network has invested in an archaeological survey along the right-of-way for the passage of a transcontinental underground telephone cable through Nevada.

The Nevada Archaeological Survey, a cooperative program sponsored jointly by the University of Nevada and the Nevada State Museum, learned in 1970 that 348 miles of cable would be planted in northern Nevada during the early part of this decade.

Members of the survey met with representatives from the Bureau of Land Management and Nevada Bell to iron out an agreement assuring that the cable-laying process would not destroy valuable bits of the state's prehistory.

A federal law known as the Antiquities Act provides that such right-of-ways must be checked for artifacts before the bulldozers move in.

But the Bell System went the Antiquities Act one better: the System offered to invest up to $10,000 in the search. A second clause in the agreement specified that sum could be increased in the event of a major find or if the company changes in the cable's route.

The archaeological survey discovered a site of major importance and the right-of-way has been rerouted 42 miles, making the total cost of the historical salvation $16,000.

"We've covered nearly the entire right-of-way," said Mary Rusco, director of the archaeological project, "and to date we've found 18 prehistoric sites."

In Nevada, "prehistoric" – or before written, recorded history – means prior to 1850, said Mrs. Rusco. The oldest site the survey discovered dates well before the birth of Christ, she said, and could be as old as 4000 B.C.

The site, located at the south end of the Black Rock Desert in Pershing County, rates as a find of major importance for several reasons, said Mrs. Rusco.

It was the only buried site the survey found along the right-of-way. "The fact that it was buried is in itself highly unusual," said Mrs. Rusco. "There's no real soil out there and usually the wind assures that remains are no more than two inches below the surface of the ground."

In addition, while the site may have been settled as long ago as 6,000 years – an exact date won't be determined until a carbon 14 test is taken – It may have been occupied as recently as 2,500 years ago, said Mrs. Rusco.

The survey also identified shells found at the site as having come from the Pacific Ocean along the California coast.

Mrs. Rusco said the survey would complete its salvage of the site this summer.

"I won't say that except for the phone company's financing we wouldn't have been able to do the project," she said, "but the money certainly helped."

"More and more companies are taking our historical and prehistorical heritage into account when they plan to modify the face of the earth."

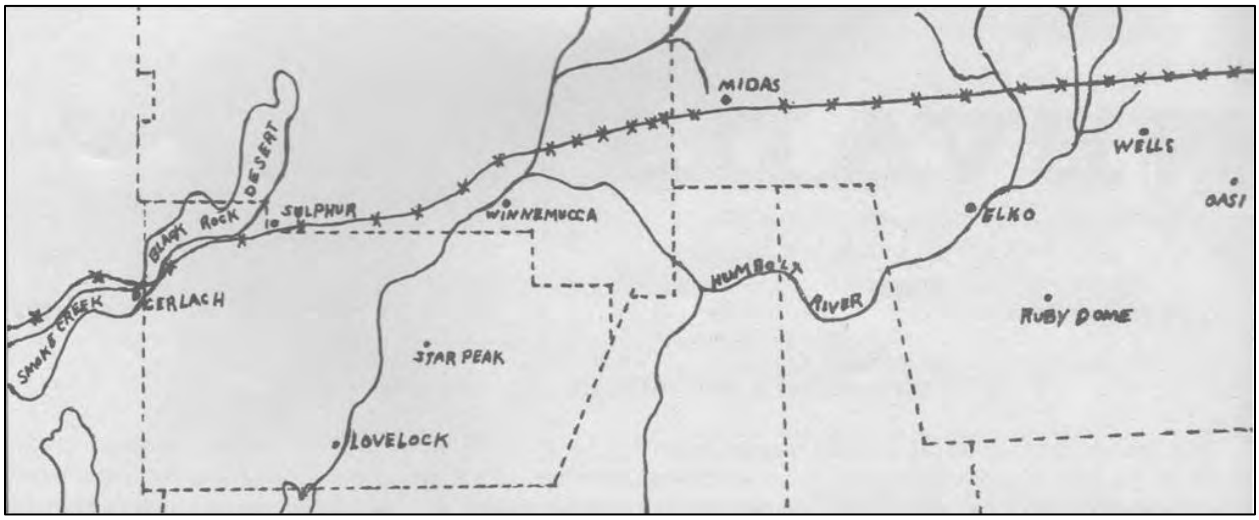
"When a major earth moving project goes through, a certain number of archaeological remains will be ruined. Archaeology exists only once."

Ed Trosi, Nevada Bell right-of-way supervisor, said the cable will be laid through Nevada early next year, well after the archaeological crew has finished its work.

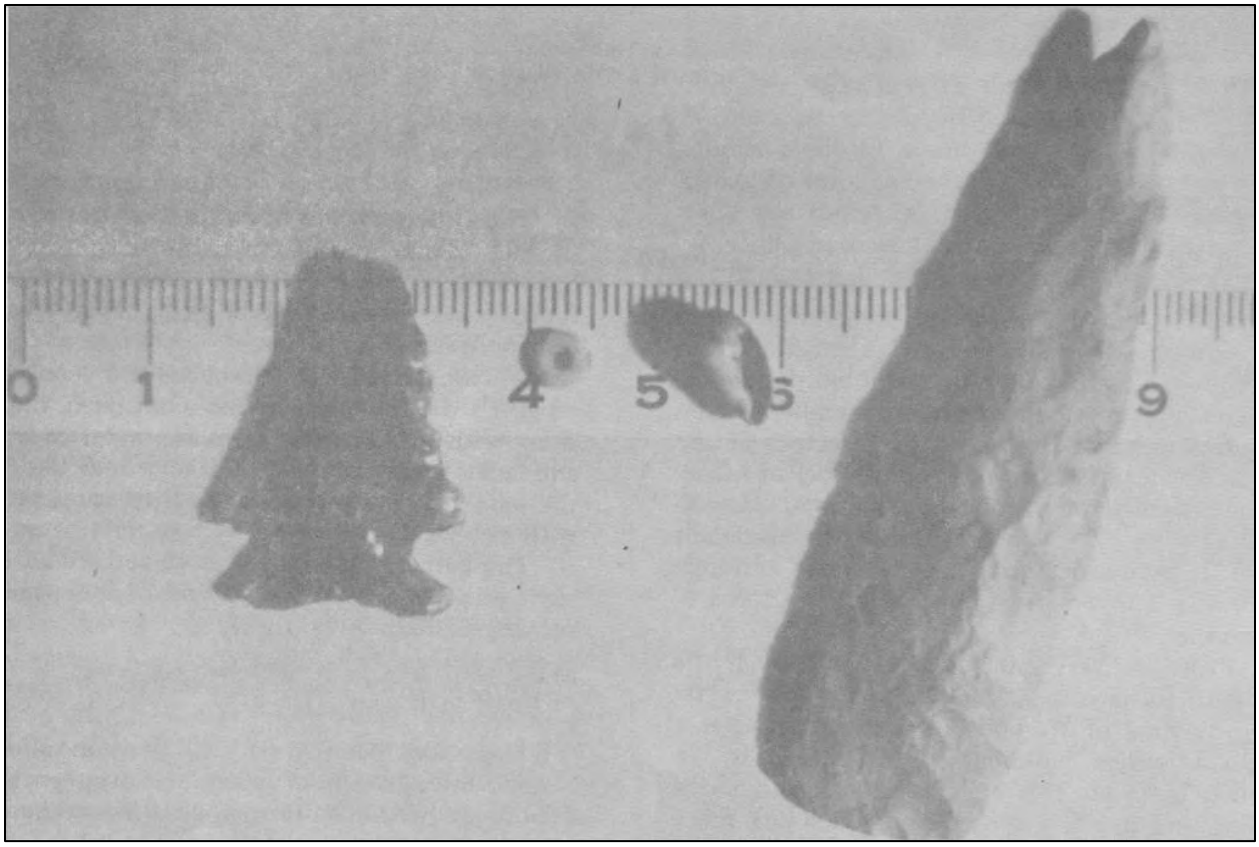
"I'm somewhat of an archaeology buff myself," said Trosi. "I'm glad we were able to help them out." The Bell System has subsidized similar projects in Wyoming and New Mexico, he said.

According to Trosi, the cable will reach the California coast and become operational in 1974. It will be capable of handling a maximum of 36,000 long distance calls at one time. Plans call for an eventual maximum of 90,000 simultaneous calls.

Mrs. Rusco said the survey is also interested in recording and photographing Nevada artifacts in private collections. "If any private collectors are willing to loan their collections for a short time, we'd certainly appreciate it," she said. Mrs. Rusco can be reached at the archaeological survey office on the University of Nevada, Reno campus. (702)784-6846.



The underground transcontinental telephone cable will pass through 348 miles of Nevada. Archaeologists have found 18 prehistoric sites along the route.



The arrowhead, bead, shell, and knife shown here were found by the Nevada Archaeological Survey in a buried site in the Black Rock Desert. The artifacts could date back to 4000 B.C. The scale is in centimeters.

A Brief History of the Discovery and Exploration of Pebble Mounds, Boulder Cairns, and Other Rock Features at the Sadmat Site, Churchill County, Nevada

Donald Tuohy

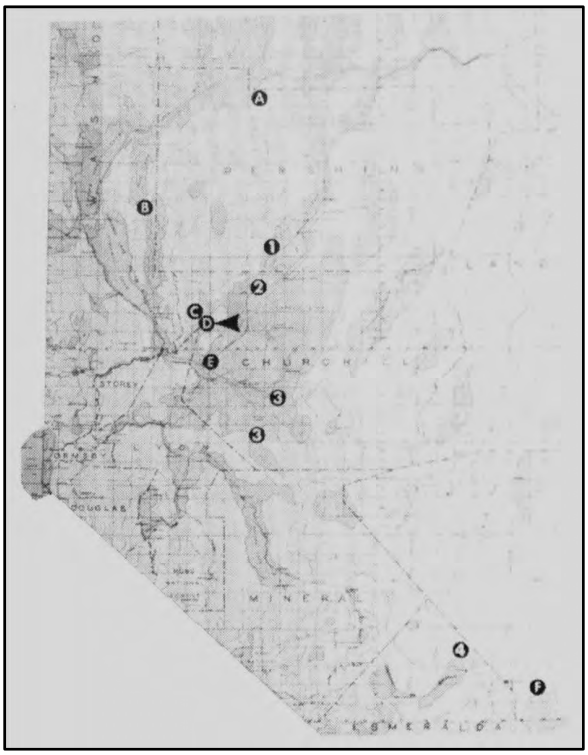
Originally published in *Nevada Archaeologist* 3(1) (1981).

The purpose of this paper is to present a brief history of the discovery of the Sadmat site with its "Early Man" artifacts, pebble mound complex, boulder cairns, and other stone features located in western Churchill County, Nevada. At the same time as providing a short history of the Sadmat site for the ensuing study of pebble mounds by Amy Dansie, this study also serves to underscore the importance of both the site and the locality, and to express the author's continuing research interest in them. The term Sadmat "site" refers to only one site, 26Ch163, the westward most in a group of sites located in western Churchill County near Hazen, Nevada. The term Sadmat "locality" refers to an area twenty to thirty miles long and three to four miles wide located between Hazen and Parran and encompassing all of the sites in the area that have pebble mound complexes (Map 1).

The Sadmat site itself was discovered February, 1965 by two former neighbors who resided in Fallon, Nevada, Mrs. Yvonne Saddler and Mrs. Etta Mae Mateucci. They and their husbands had been driving along a pole line road near Hazen Butte in western Churchill County when they decided to make a rest stop. While walking between the pole line road and the railroad tracks, they noticed and picked up a collection of prehistoric artifacts. Finding the whole area, about two square miles, to be productive of artifacts they returned on successive weekends to gather additional specimens. There was so many that the ladies made canvas bags with shoulder straps to hold and to carry artifacts from the site on weekend forays. When catalogued at the Nevada State Museum several years later, the collection contained over 3,000 specimens.

Realizing the importance of their collection, the ladies first took the artifacts to Mrs. Clara Beatty at the Nevada Historical Society Museum in Reno who suggested they contact Margaret "Peg" Wheat, also a Fallon resident. Mrs. Wheat, at that time, was affiliated with the Nevada State Museum as Research Associate in Ethnology, and had been a member of several archaeological expeditions led by Dr. Richard Shutler, Jr. Mrs. Wheat had a portion of the Saddler and Mateucci collections at the George Whittel estate at Lake Tahoe when I first saw them in 1965. I was struck at the time by the similarities between the artifact classes and types and those reported from several Early Man sites in Nevada and in California such as some of the surface artifacts from Tule

Springs reported by Susia (1964), San Dieguito materials reported by Malcolm Rogers (1939), and the Lake Mohave artifacts reported by Amsden in Campbell and Campbell et al. (1937).



Map 1. A portion of western Nevada showing Pleistocene lakes, and archaeological localities where "Early Man" materials have been recovered. The letters and numerals refer to several such sites; locality "D" with the attached arrow indicates the Sadmat locality. The map was adapted from Snyder, Hardman, and Zdenek (1965).

Both Dr. Wilbur A. "Buck" Davis, who held a joint appointment in the Anthropology Departments at the State Museum and at the University of Nevada, Reno and I became aware of the Sadmat artifact collections roughly at the same time, and immediately asked to be shown the site. Mr. and Mrs. Saddler, Mrs. Mateucci, Mrs. Wheat, and I all visited the site together in June, 1965. At the time, I presumed Dr. Davis had made out a site record form, and he must have presumed the same for me, as it was several years later when I discovered that neither one of us had recorded the site properly. Subsequently, it was recorded, but not mapped, and was given the Smithsonian designator 26Ch163, and the name "Sadmat" from the first three letters of each finder's surname. Dr. Wilbur Davis (1966:149) was the first professional archaeologist to mention the site in the published literature when he noted that early appearing artifact types had been recovered from 3,955 foot beach terraces of Lake Lahontan at Falcon Hill (Tuohy 1970) and from "...the vicinity of Hazen." Since the collections were retained by the finders at separate households in Fallon, Nevada it was difficult to do any kind of analysis and recording of the artifacts. Nevertheless, with the help and cooperation of Mr. Mateucci, Dr. Claude Warren, Anthony Ranere, and I were able to do a study of the artifact types contained in the Mateucci half of the collection in 1966. Dr. Warren was asked to participate in the study because of his intimate knowledge of San Dieguito materials found in San Diego County, California (Warren and True 1961), and because of the presumed resemblance Dieguito assemblages. His interpretations of the Sadmat site and Mateucci collection of artifacts were published in 1968 (Warren and Ranere 1968:6-18). My notes on this study are appended to this report (Appendix 1).

In the same volume (Irwin-Williams 1968) as Warren and Ranere's (1968:6-18)

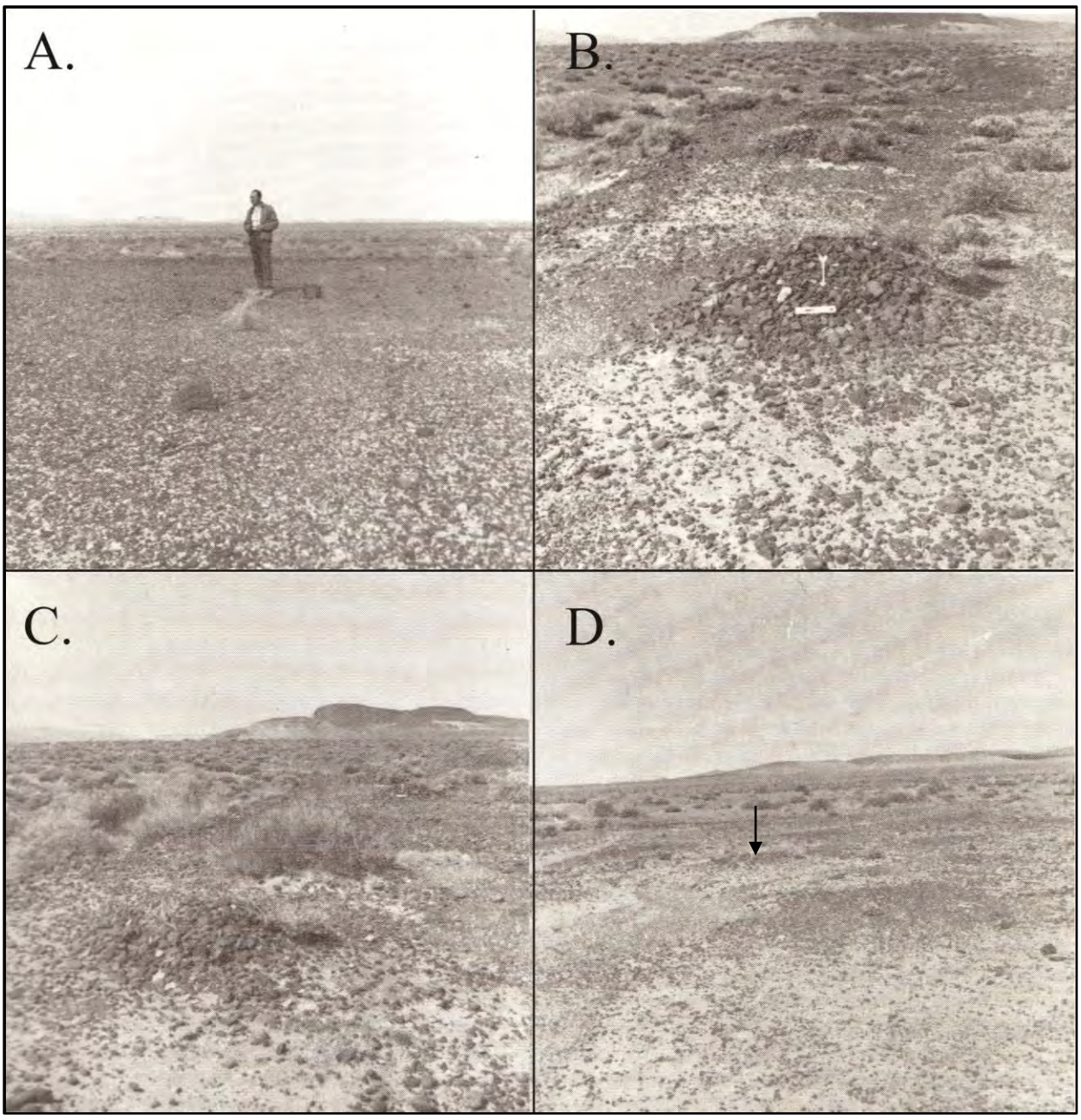


Figure 1. Four views of the Sadmat site (26Ch163): (A) Steve Teiber standing on normal or undisturbed desert pavement at the Sadmat site; (B) Row of pebble mounds located at the west end of the Sadmat site; (C) The same row of pebble mounds with Hazen Butte in the background; (D) Arrow in left center indicates the location of the excavated pebble mound at Sadmat.

paper was published, I summarized sketchy information of some early lithic sites in western Nevada in which mention was made of the Sadmat site and some of its artifact types (Tuohy 1968:27-38). While mention was made of …"San Dieguito-like rock cairns and rock alignments having circular and rectangular configurations" at Sadmat,

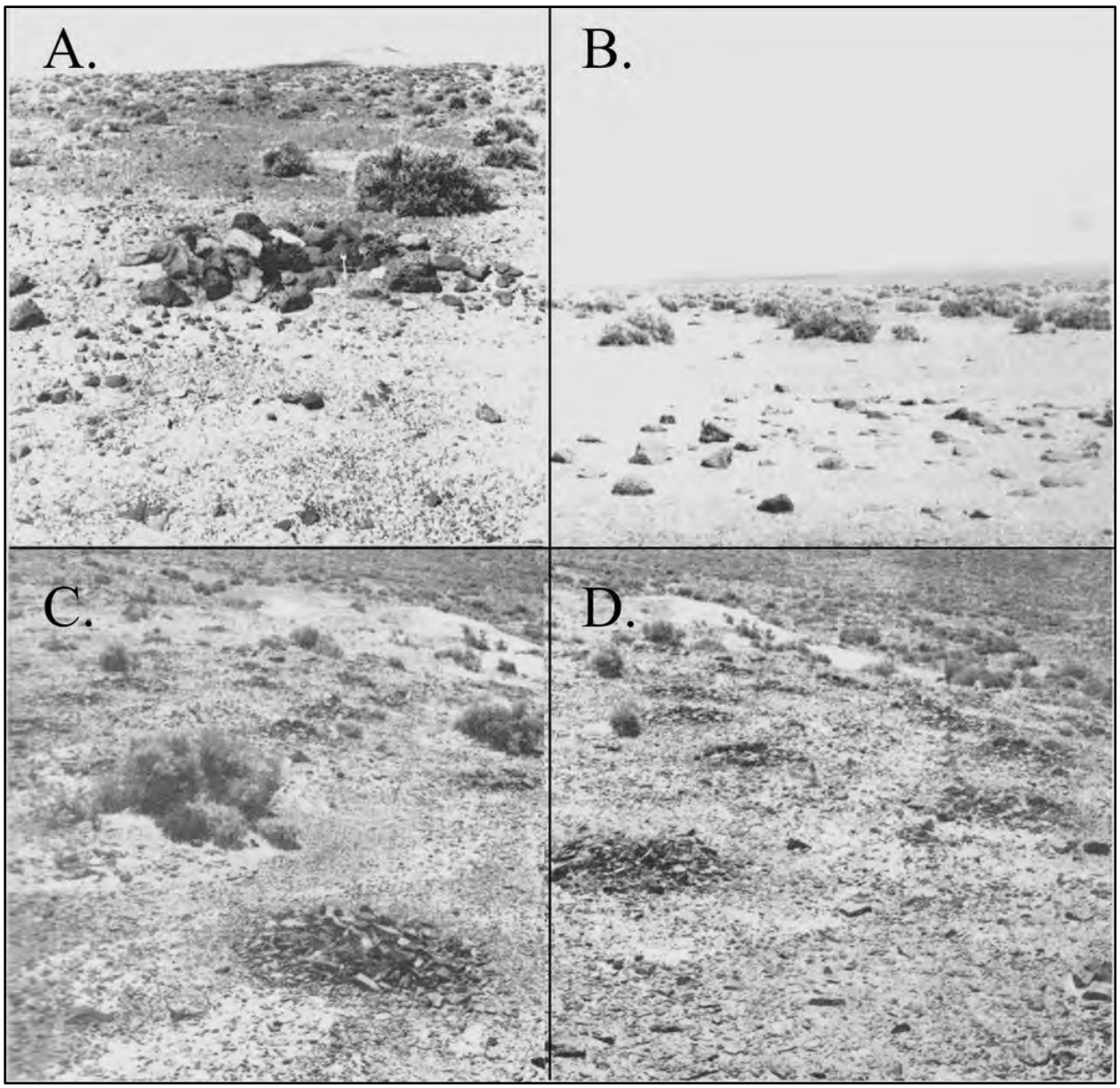


Figure 2. One view of a boulder cairn and a circular or radial grouping of rocks at the Sadmat site, and two views of the Peter Ting, Sr. site located on the Black Rock Desert: (A) A boulder cairn at the Sadmat site; (B) A circular or radial arrangement of stones at the Sadmat site; (C-D) Two views of the Peter Ting, Sr. site (photo courtesy of Peter Ting, Sr.).

the article (Tuohy 1968:27) did not specifically mention the pebble mound complex also found there. A second paper, published the following year (Tuohy 1969:133-144), briefly mentions the Sadmat site and illustrates artifacts from it, but again, the pebble mound complex was not discussed in detail.

Quite early in the history of Sadmat investigations Dr. W. Davis, Dr. Warren and I realized how important it would be to obtain aerial photographs of all the rock alignments at Sadmat. At one time, I had actually put

Figure 3. Projectile points of several types from the Sadmat site: (A) Lake Mohave points and variants are the first five in the top row; the sixth point fragment in the top row and the bottom two rows were classified as Haskett points; (B) Six Lake Mohave points and variants; (C) The two top rows were classified as Bipointed points; they have some overlap with the Lake Mohave style; the bottom row was called Oval-leaf type; (D) Lake Mohave points and Stemmed points of several types.

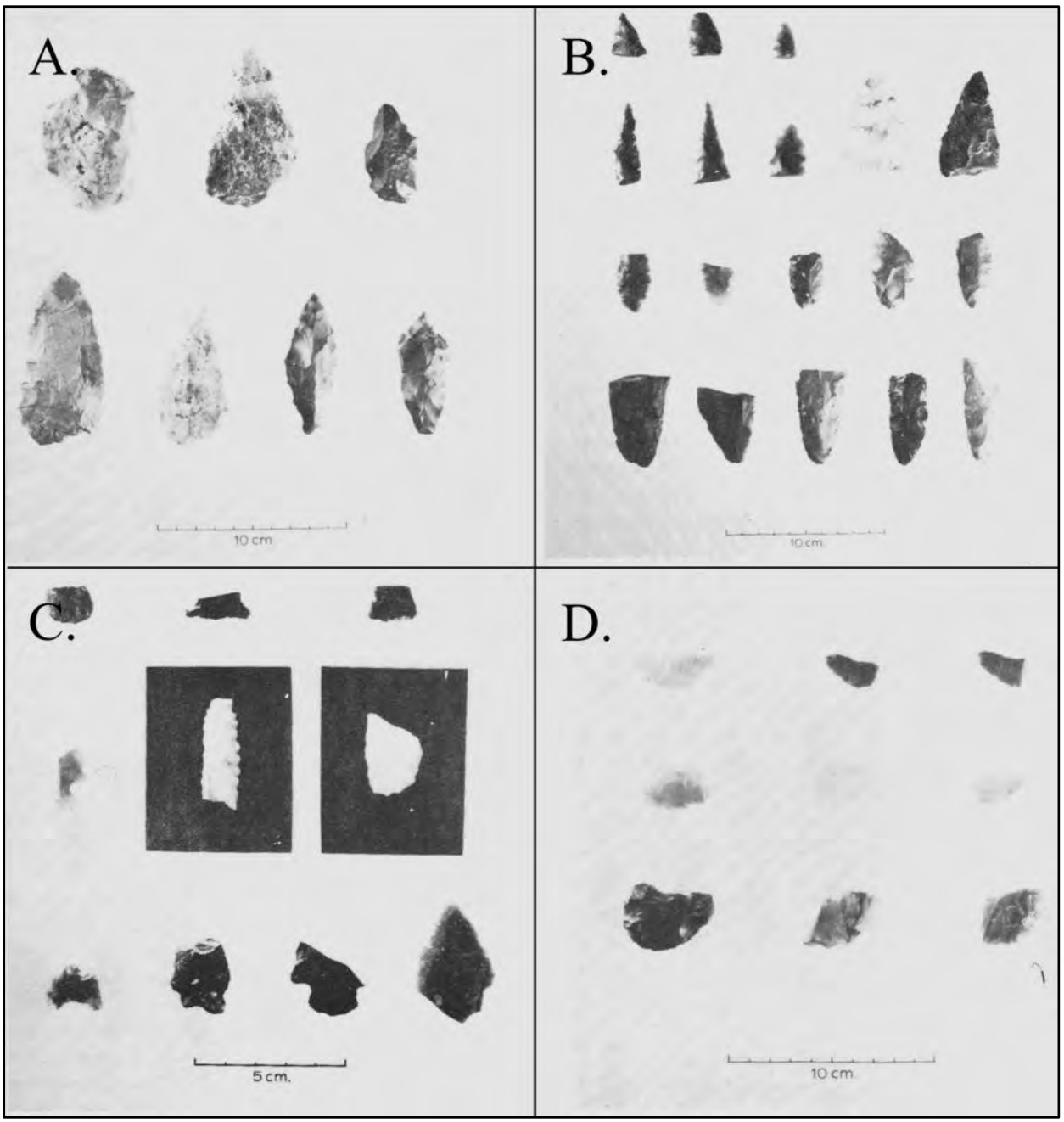


Figure 4. Bifaces, biface fragments, point fragments, and crescents from the Sadmat site: (A) Top row contains roughouts; the bottom row contains incompletely reduced bifaces; (B) Top two rows are pointed biface fragments; the lower two rows are biface fragments with rounded tips; (C) Projectile point fragments of the Triangular, Rose Spring, Pinto, Humboldt, other series of Great Basin points; (D) nine crescents.

ground markers down at both ends of the Sadmat site for use by a photographic reconnaissance unit of the Nevada Air National Guard. They had to postpone the flight because of emergency maneuvers, however, and I never did call them again to renew the

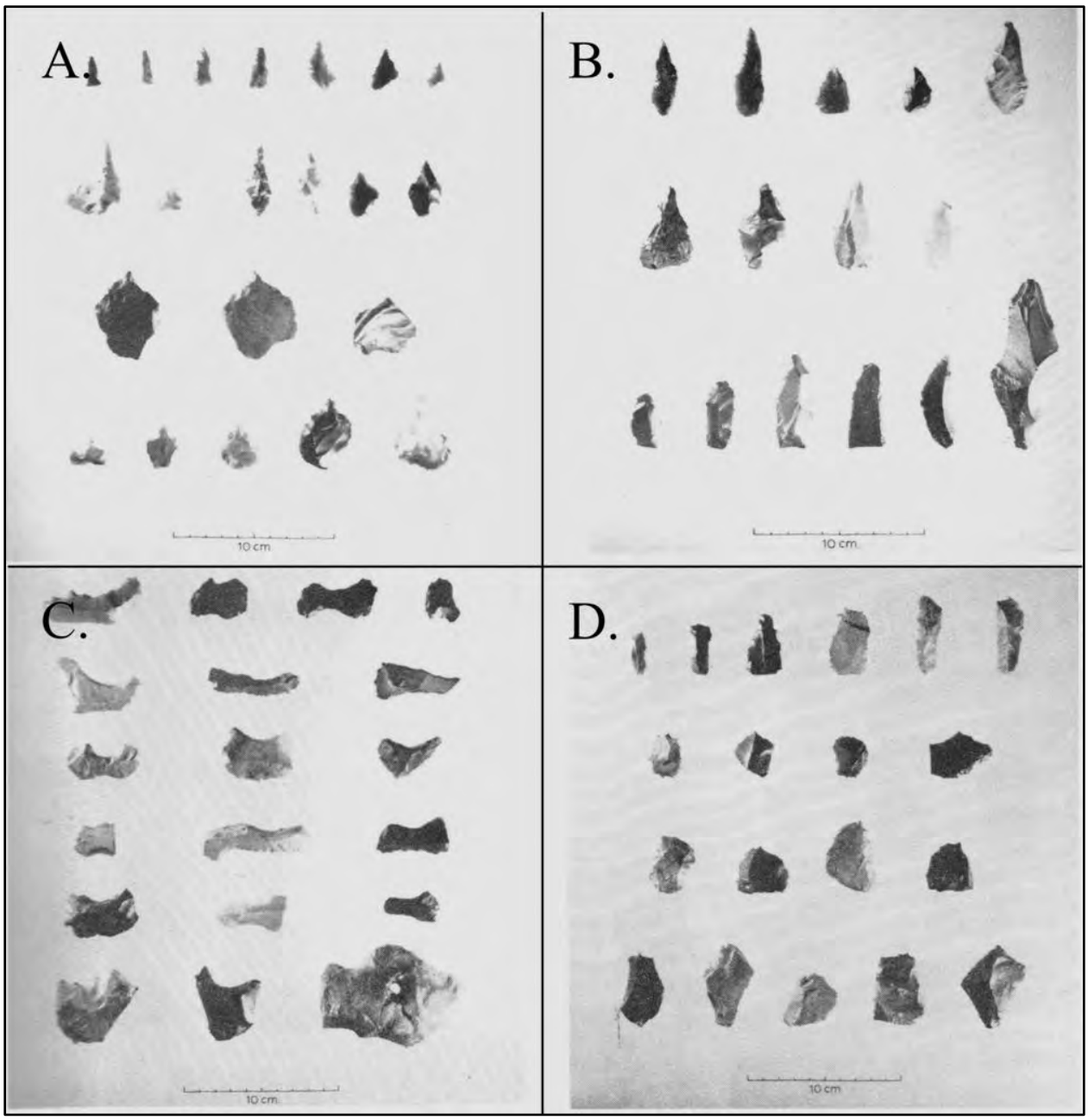


Figure 5. Drills, gravers, pointed scrapers, reamers, scraper-gravers, prismatic blades, concave scrapers and scraper-gravers, and gravers on blades and flakes from the Sadmat site: (A) Drills of various types, top three rows; blunt nose gravers are in bottom row; (B) top two rows, scrapers and reamers; bottom row prismatic blades; (C) concave scraper-gravers and concave scrapers; (D) gravers on blades and flakes.

appointment for the overflight and photography.

Meanwhile the year passed by, and because of the early notoriety the site had received, a number of Nevada amateur archaeologists decided to visit it. I remember one such visit in March, 1968 accompanied by the late Peter Ting, Sr. and Stephen V.

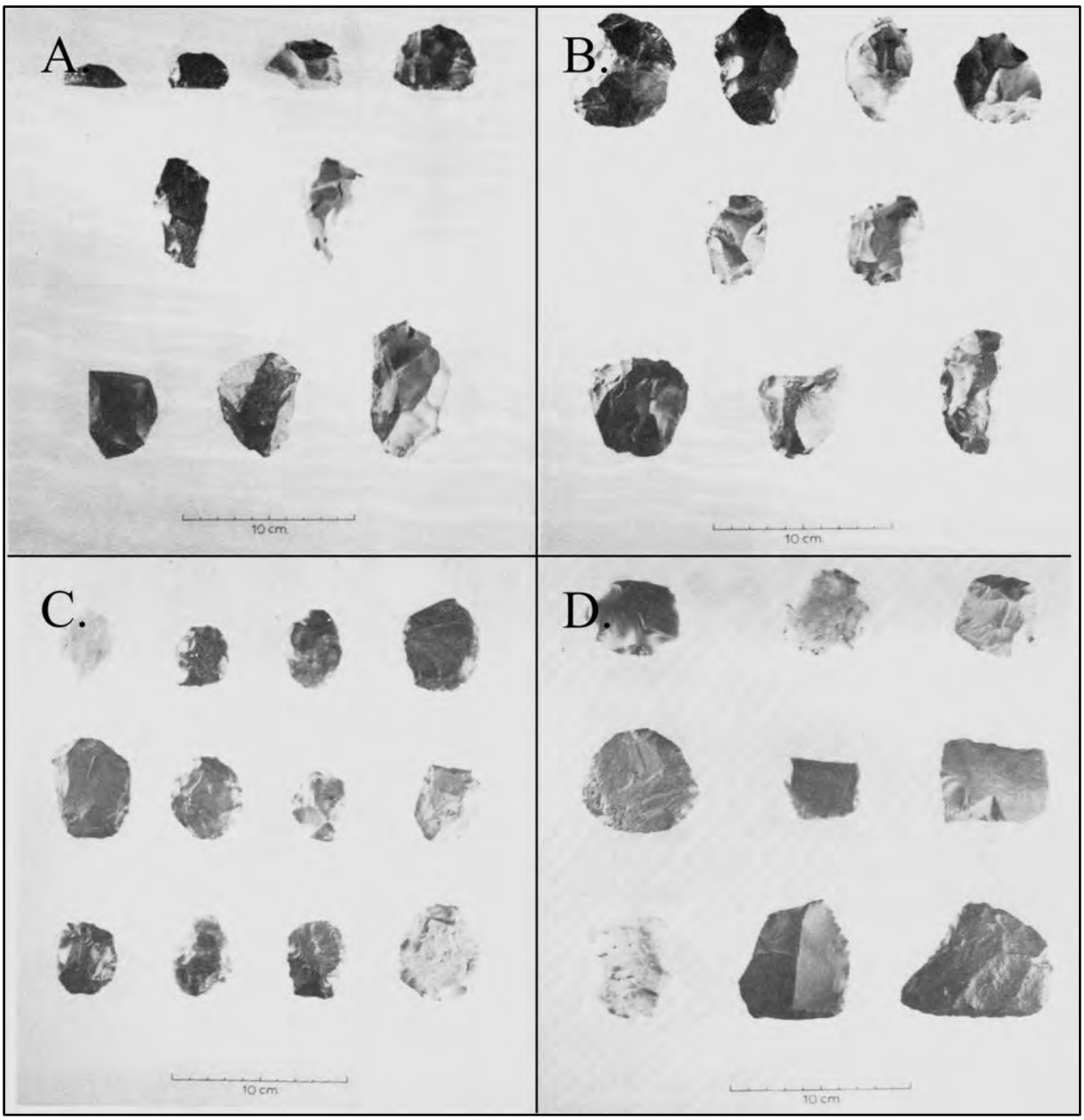


Figure 6. Cores, scrapers, knives, and flake scrapers from the Sadmat site: (A) Tongue-shaped cores, top row; lower two rows are bifacial cores; (B) Platform cores, top row; Irregular cores, second and third rows; (C) Ovate scrapers, top row and first one in second row; Ovate knives, second row, the last two and the bottom row; (D) discoidal scrapers, the top row and the first in the second row; Rectangular scrapers, last two, second row, and the bottom row.

Tieber (Figure 1 a, b, c). They were particularly interested in the row of pebble mounds located near the west end of the site and they called my attention to it. I had noted the row previously, but because of the mounds' modern appearance I assumed that: 1) either

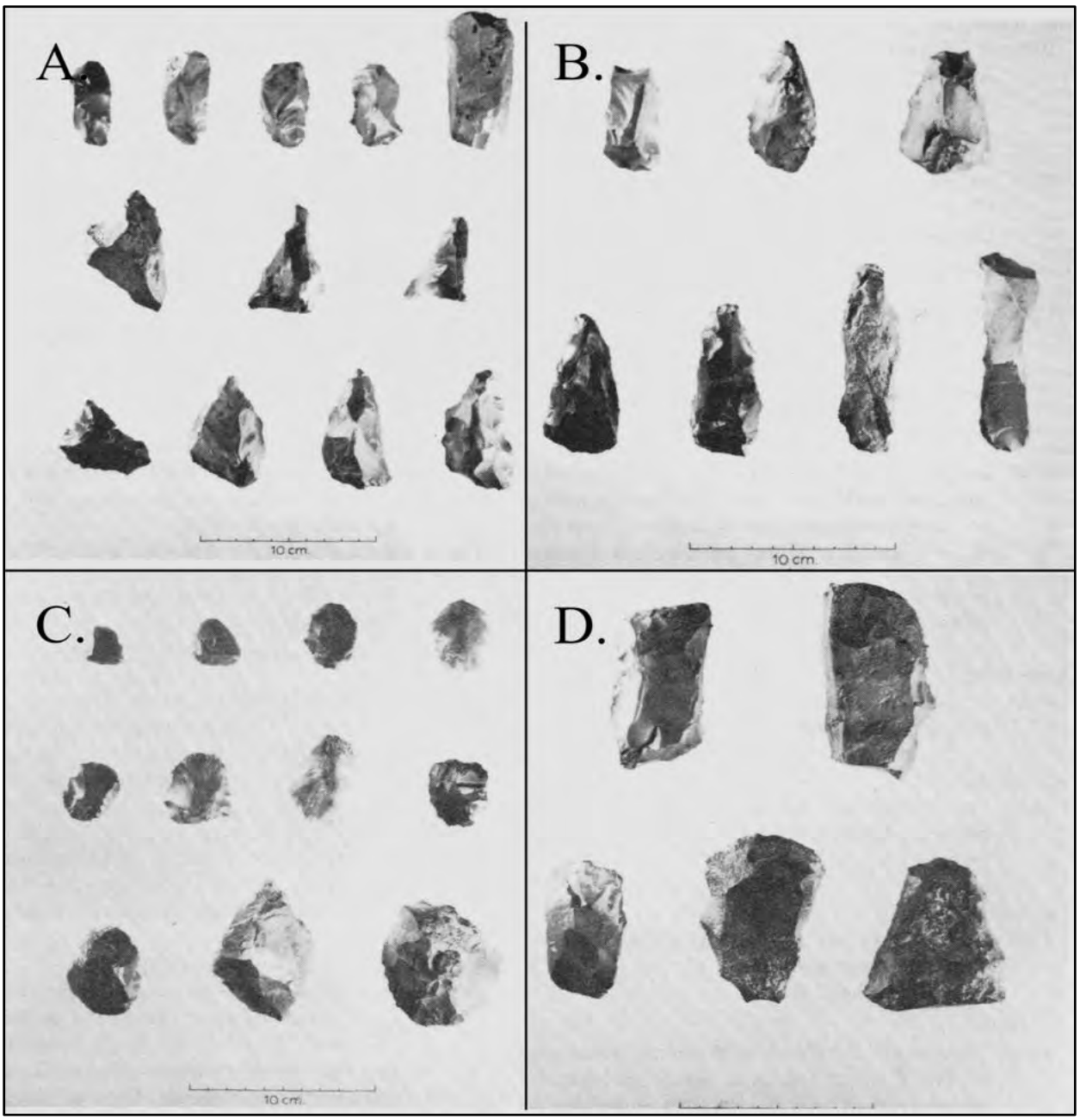


Figure 7. Several varieties of scrapers from the Sadmat site: (A) Top row, keeled and blade end scrapers; bottom two rows, keeled and pointed scrapers; (B) Elongated, keeled scrapers; (C) Top row and first in second row, Tabular, or thumbnail scrapers; Last two in second row and all in bottom row, domed scrapers; (D) Top row, block scrapers; Lower row, block side scrapers.

the ladies had raked up the pebble mounds in the course of their collecting activities, or 2) the pebble mounds were related to construction activities on the nearby railroad grades, either in 1868 or in 1904 (dates from Dansie 1981).

To satisfy my own curiosity about them, I excavated a test excavation pit in one of

them in 1968 (Figure 1d). The pit sliced one of the mounds in half, and my notes state that the pebbles were about the size as might be caught by the tines of modern rake, while adjacent gravels were smaller in all dimensions, and of a size which would pass through the tines. Also, I had noted at the time that the bulk of the pebbles comprising the mound were not pitted or worn from wind erosion (Davis 1967:345-343), as one might expect had the mounds been in existence for six to ten decades or more. In addition, many pebbles in the mound were noted in which the iron stains formerly on the bottom side of the desert pavement were turned face up, and vegetation growing in the mounds appeared to be much younger than larger, nearby plants. Also, there were no waste flakes from stoneworking present in the mound. In all, the pebble mound excavation appeared to confirm my belief in their temporal recency, and I dismissed them from my mind, not even reporting the test excavation.

Seven years later when contract archaeology had come into full flower, Amy Dansie and I did a field reconnaissance of a 6½-mile square area of the Carson Desert area for a proposed site of an electrical power plant. This survey located one site (26Ch190) with a large number of pebble mounds. Both the mounds and the pebbles themselves seemed considerably more robust than those recorded at the Sadmat site (Rusco and Tuohy 1975:15-18). Unquestionably, we were dealing with the same phenomenon in the desert pavement at approximately the same elevation, ca. 4,000 feet, in the Lahontan Basin. But, as yet, we had no idea as to the areal extent, or the total number of pebble mounds at either site.

The next discovery came as a result of the Bureau of Land Management's decision to inventory federal lands for cultural resources before disposing of them. John Roney (1978:6) reported a series of 39 pebble mounds located on a barrier bar above the 4,040 foot contour on the eastern slopes of the Hot Springs Range near Parran, about 20 miles from Sadmat. Found near the pebble mounds were 32 artifacts from lithic scatters near the pebble mounds. The artifacts included Haskett or Cougar Mountain Points, Lake Mohave and variant points, obsidian silicate, and other stone knives and bipoints, gravers, scraper/gravers, scraper planes, and large and small scrapers and other tools identical to types recovered at the Sadmat site (Roney 1977). In short, this site (26Ch510) was estimated to have been occupied between 11,100 and 9,000 years ago on the basis of the artifact types present there (Roney 1978:9). By implication, the pebble mounds at the site were presumed to be of the same age as the artifacts.

One year after Roney (1978) had reported the pebble mounds at the embayment on Hot Springs Mountain, the late Peter Ting, Sr., the amateur archaeologist who had visited and collected artifacts from the Sadmat site, reported to me the presence of pebble mounds in desert pavement on the east side of the Black Rock Desert at an elevation of 3,940 feet. I had asked him to be on the alert for such phenomena because *two separate localities* in northern Nevada with pebble mound complexes would certainly buttress arguments favoring a prehistoric age for them. He reported to me the presence of 302 such mounds covering an area about 300

feet long by 40 feet wide "... placed in linear or fairly straight rows." Unlike the previously reported sites, no artifacts were associated with these pebble mounds. I subsequently reported this site (Figure 2c, d) to the Bureau of Land Management, and it was named the Peter Ting, Sr. site, but, as yet, it has not been given a Smithsonian site designator.

Elsewhere in the Desert West, particularly in the Colorado Desert, Death Valley, and portions of San Bernardino, Riverside, San Diego, and Imperial Counties in California, linear alignments of rock cairns, exact duplicates of the Sadmat and Black Rock Desert localities' pebble mound complexes, have been found and recorded. A short paper published by Wlodarski and Mcintyre (1979:137-142) summarizes available data from some of these sites. The earlier substantive contributions to knowledge of pebble mound complexes in these California Desert areas were made by Rogers (1939:11, 1966:55), Wallace et al. (1958), Hunt (1960:115), Hanenszel (1978), and Begole (1973, 1974, 1976) among others.

Renewed interest in Nevada sites particularly in the Sadmat locality dates from 1980 when Sharon Edaburn, Director of the Churchill County Museum and her pilot friend, Charles Gomes, flew over western Churchill County and rediscovered and photographed the pebble mound complexes from the air. Her aerial photographs combined with ground examinations of the pebble mounds and mapping projects sponsored by the Bureau of Land Management have resulted in new insights into the archaeological phenomena represented by the mounds. Some of these insights were presented at the May, 1981 meeting of the Nevada Archaeological Association (Edaburn, Dansie, Davis, and Roney 1981). The ensuing paper by Amy Dansie explores in detail the many possible functions proposed for sites with pebble mound complexes.

With reference to my own views on the pebble mounds at the Sadmat locality, I am of the opinion that some of the pebble mounds eventually will be shown to be of historic age, and related to the gathering of gravel for use in railroad grade or highway construction, or repair work. The plain fact of the matter is, however, that all of the evidence is not yet in, and one should keep an open mind concerning both the function of, and the age of pebble mounds in western Nevada.

With reference to the Sadmat *site* alone, I should like to make it clear that not only are pebble mounds present there, but many of them appear to be mere remnants of mounds, the pebbles having been scooped up by unknown parties for unknown uses. Also, pebble mounds are not an exclusive type of rock formation of cultural origin at the Sadmat site. There are roughly a dozen boulder cairns of the type illustrated in Figure 2a located at the Sadmat site. There are also an unknown number of other slightly displaced linear, circular, and rectangular rock alignments, one of which is illustrated as Figure 2b, present at the Sadmat site. These features also have not been mapped as yet, but comprise a continuing research concern and interest of mine.

The latter statement is expressed here in print because of the overlapping jurisdictions and research interests of recent archaeological field investigators working at the Sadmat locality. For example, in the vicinity of

the Sadmat site, land ownership is in the "Railroad checkerboard," and there are parcels of Public Domain lands, Bureau of Reclamation withdrawals, and private lands present there. Until recently, there were few section markers, and it was difficult to tie archaeological features to any kind of datum point established by an engineering survey.

Then too, the last of the archaeological collections from both the Sadmat site and the locality have only recently been deposited at the Nevada State Museum. The Peter Ting, Sr. collection of artifacts from the Sadmat locality was accessioned in October, 1980. The Mateucci half of the Sadmat site collection was accessioned in August, 1973. The latter artifacts were the gift of Mrs. Etta Mae Chase (nee, Mateucci). The Saddler half of the Sadmat site collection, of course, was accessioned two years before that in 1971. It was donated to the Nevada State Museum in the memory of Yvonne Saddler's husband, Harry Saddler, now deceased.

Now that the data base for the Sadmat site has stabilized, I am looking forward to future research at the Sadmat locality both in the field and in the laboratory. Studies of the existing artifact collections should enable qualitatively and quantitatively precise studies of the artifacts to emerge. Whether or not the Sadmat site should be included in a "western pluvial lakes tradition" as Bedwell (1973:170-171) has indicated, in the "Hascomat complex" as Warren and Ranere (1968:11) have defined it, or in a Stemmed Point Tradition as Bryan (1979:244) has suggested, needs further review and thought. Certainly, the prehistoric people who lived at the Sadmat site undoubtedly made the boulder cairns and the linear and circular rock alignments, and it is not inconceivable that they were responsible for constructing at least some of the pebble mounds, as well. Amy Dansie's paper, to follow, explores some of these possibilities.

ADDENDUM

Since the above paragraphs were written Alan L. Bryan (1980:77-107) has produced a broadly conceived synthesis which postulates a "Stemmed Point Tradition" for the Intermountain West. Summarizing his conclusions briefly, I quote Bryan (1980:102) who postulates a tradition "...which began in the Great Basin at the end of the Pleistocene as a technological adaptation to the hunting of herbivores, including mountain sheep, bison, camelids, and horses (and) ...it developed at least as early as the Fluted Point Tradition." Surely, Bryan's study (1980) is focused on the larger picture of what happened in western North America on an Early Man time level (13,000 to 7,000 BP). There is no doubt that Bryan's synthesis looks at forests and not trees, but as a regional archaeologist, I think we need to examine the trees (i.e, the Early Man sites, their features, and the artifacts from them) much more closely than we have to date (without becoming myopic), before conclusive evidence supporting half-a-continent-wide tradition can be mustered. On the other hand, perhaps Bryan's "Stemmed Point Tradition" has its merits as an appellation. It certainly seems superior to any of the hyphenated versions suggested so far, including my own postulated "Lake Mohave-Pinto" Tradition (Tuohy 1974:100).

APPENDIX I: NOTES ON THE TYPOLOGY AND TECHNOLOGY OF SADMAT SITE ARTIFACTS

Artifacts from the Mateucci half of the Sadmat collection comprise the sample of specimens illustrated in Figures 3 through 7. Claude Warren (Warren and Ranere 1968:9) had previously noted that there were 75 Haskett and "Haskett-like" points, 15 Lake Mohave points, 25 bipointed leaf-shaped specimens, 40 round-based leaf specimens, and several each or less of more recent types (illustrated in Figure 4 c). He also noted that the collection included lanceolate, leaf-shaped and circular knives and leaf-shaped bifaces with coarser flaking than noted for the projectile points. Scrapers included 72 of the concave type (Figure 5), elongated, keeled and domed scrapers, oval side scrapers, keeled end scrapers, pointed scrapers and retouched blades (Figures 5 through 7). Steep and thumbnail scrapers were present, but not numerous. Gravers and drills (Figure 5) were quite numerous with 185 gravers counted in the Mateucci collection. There were also nine simple crescents (Figure 4d), and a few large, percussion flaked scrapers or choppers as well as cores of various forms (Figure 6). All of the classes of tools in the collection are illustrated except the elongate, flat side scrapers which in plain view look very much like the rectangular scrapers illustrated in Figure 6.

The collateral flaking technology present on the stemmed and lanceolate points from Sadmat was noted by Warren and Ranere (1968:11). They state that the flaking scars were produced by a pressure technique that produces broad, shallow flakes that feather out near the midline in a collateral fashion. Edges are often retouched. This technology was also noted on Haskett and Birch Creek points in Idaho as well as on points from Cougar Mountain Cave in Oregon (Layton 1972:13-19, Figs. 1-7; Cowles 1959), according to Warren and Ranere (1968:11), and they suggest the name "Hascomat complex" for the stemmed points having such collateral flaking scars. A complete study of all specimens from the Sadmat site together with the metrical data may help to resolve questions on the technology of Sadmat artifacts.

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Discovery and C^{14} Dating of the Black Rock Desert Mammoth

Betty Stout
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The searching and digging in Pleistocene sediments in northern Nevada have produced evidence of Early Man in the Black Rock Desert. Several sightings of fragments of fossil bone indicated that prehistoric animals roamed the land. A variety of disciplines were needed to interpret the story these tangible elements were attempting to tell. When two or more scientific disciplines and their practitioners cooperate on a given site, results are dramatic. Such was the case in the summer of 1982 when teams of paleontologists and archaeologists labored together excavating the remains of a mammoth in the Black Rock Desert, Humboldt County, Nevada.

In 1981, under the auspices of the Nevada State Museum, Carson City, Nevada, a scientific excavation was started on the site where a molar of a mammoth had been discovered two years earlier. As work progressed, it was evident that most of the skeletal elements were articulated and were there to be recovered. Also present on the surface and to some depth in the site were flakes of stone indicating the labor of human hands. Hope was running high that man's involvement with the demise of the creature might be established. But man was not the only predator. A deciduous tooth of a saber-toothed cat was found in the northeast corner of the site.

Work was not completed before signs of winter appeared. The site was closed to protect it from vandalism and the forces of nature.

The site was reopened in the summer of 1982. Dr. Ruth Gruhn, University of Edmonton, Alberta, Canada, volunteered her services and directed the continuing work of the excavation. Dr. C. William Clewlow, Jr. and his team of skilled workers, along with Richard Reynolds, paleontologist from the George C. Page Museum, Los Angeles, exhibited their skill at this arduous but rewarding work. The Am-Arcs of Nevada, an organization of amateur archaeologists, also provided welcome assistance. All of the work was done on a volunteer basis. A camper for housing Dr. Gruhn and vehicles for transporting supplies and water were supplied by Dr. Ken Taber, a Reno dentist. An interested observer and of invaluable help in indicating sites for future investigation was Sessions "Buck" Wheeler, well-known educator and western writer.

The Black Rock Desert is not a choice place to be on a hot, summer day. Often the thermometer registered l20°F. in the gridded pit where the workers were excavating their valuable find. Sunset brought blessed relief, and the crews assembled in camp every evening to enjoy the food stored in huge ice-chests which had been transported from Reno, 180 miles away. A sudden violent sand storm one day reduced visibility to zero, but

caused no damage except to human eyes and skin.

Archaeologists and paleontologists, working as a team, carefully applied a hardening agent, a lacquer cement called "Glyptal" mixed with acetone, to each bone as it was uncovered. The larger specimens were jacketed in plaster-soaked burlap to provide immobility in transportation. The enormous cranium, together with the tusks, was too large to jacket as a single unit. The tusks were removed from the cranium and jacketed separately. Every grain of sediment removed from the site was sifted through $^1/_8$" wire mesh screens. Varieties of gastropods were recovered and collected for dating.

When the project was completed, it was estimated the total weight of jacketed and boxed elements was approximately two tons. They were transported to Carson City by a BLM dump truck and the by the State of Nevada to the Stout Laboratory, Anza-Borrego Desert State Park, Borrego Springs, California. There, the bones were prepared and restored for exhibit by Ralph Danklefsen and Betty Stout and various volunteers. Upon completion of their restoration, the bones were returned to the Nevada State Museum, Las Vegas, Nevada, where the tusks and cranium are on display. All the other elements also are catalogued and stored in the museum.

Measurements indicate this animal stood thirteen feet high at the shoulder. It was an adult male *Mammuthus columbi*, Columbia mammoth, one of the largest ever recovered on the North American continent. A sample submitted for Cl4 dating indicates it lived 11,000 years ago (Appendix l).

It is well documented that several cultures of *Homo sapiens* have occupied the area known today as the Black Rock Desert. Evidence of this is obvious when one views the great collections of stone tools manufactured and used by these early people (Clewlow 1968:1-93). Likewise, collections of fossil bones indicate that mammoths, horses, camels, bison and other large vertebrate animals, now extinct, also lived here. Did man and beast share these temperate environs? With today's sophisticated methods of dating, evidence is developing that they did.

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APPENDIX 1: RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No.: GX-11067
Date Received: 04-09-85
Date Reported: 07-22-85
Submitted by: Betty Stout
Sample Name: Pliu 8 (Mammoth). Pleistocene dry lake bed Black Rock Desert, Humboldt County, Nevada.
Age: 11,080±300 C-14 Years B.P. (C-13 corrected)

Description: Sample of bone. Apatite fraction dated, collagen not preserved.

Pretreatment: The bone was thoroughly cleaned and washed with dilute acetic acid to remove surficial carbonates and other adhering material. The bone was then crushed to less than l mm in size. The bone powder was then digested in cold dilute acetic acid with constant agitation for 24 hours to remove normal carbonates. The sample was then hydrolyzed under vacuum with HCl to dissolve bone apatite and evolve its CO_2 for collection and analysis.

NOTES

This date is based upon the Libby half-life (5570 years) for ^{l4}C. The error stated is ±1 as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid. Krueger Enterprises, Inc. 24 Blackstone Street, Cambridge, MA, 02139.

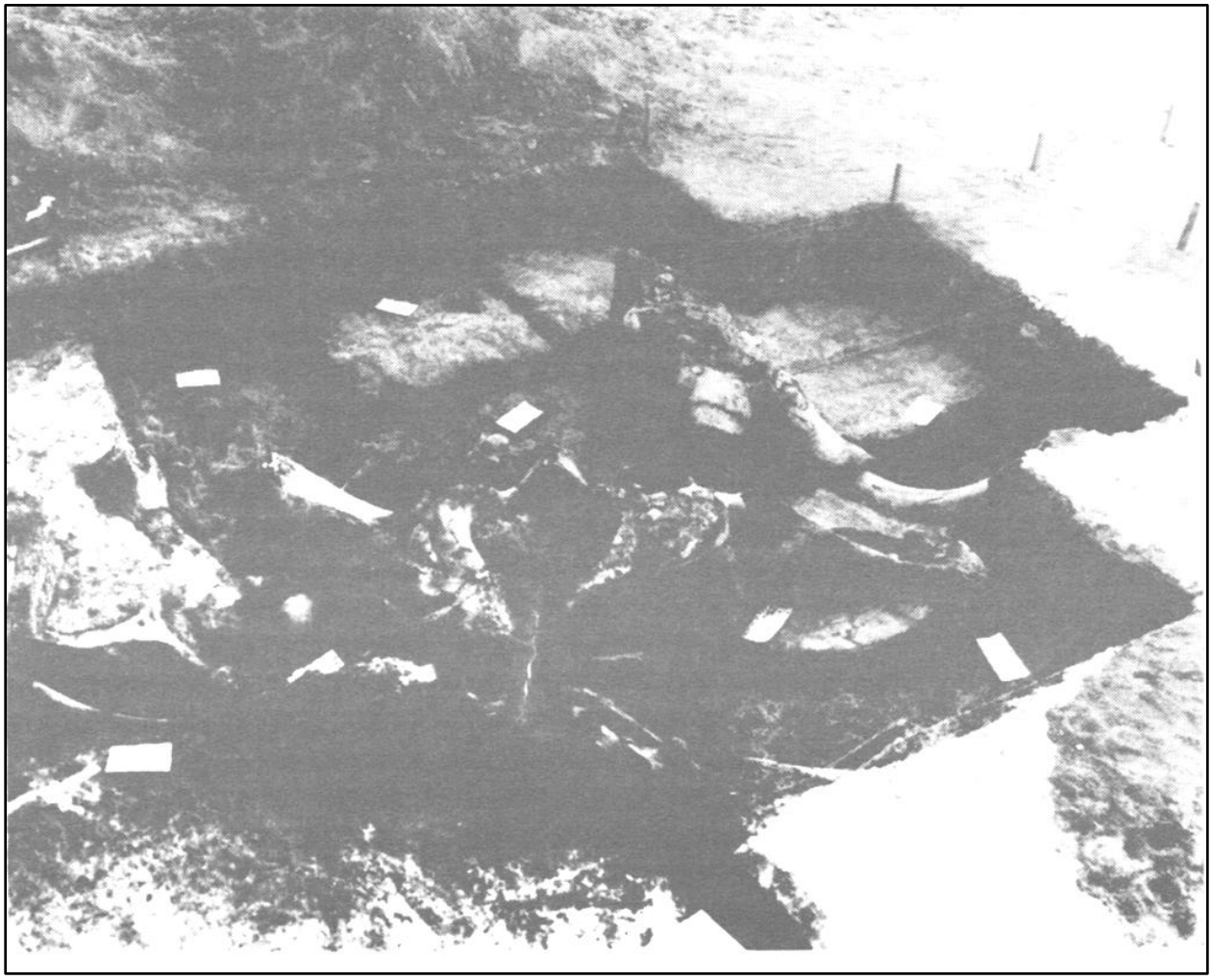


Figure 1. View of the Black Rock Desert mammoth as exposed in 1981.

The 1987 Archeological Fieldwork at Handprint Cave, Nevada

Ruth Gruhn and Alan Bryan
Originally published in *Nevada Archaeologist* 6(2) (1988)

LOCATION AND DESCRIPTION OF THE SITE

Handprint Cave (26Hu1836) is located in northwestern Nevada. The entrance of the cave affords a high lookout, with a large part of the Black Rock Desert in full view. Altimeter readings indicate an elevation of approximately 1,346 meters or 4,416 feet at the entrance to the cave, which is situated at the base of a limestone cliff. Directly below this cliff, a very steep talus slope descends to the level of the expansive alkali flat of the Black Rock Desert, at an approximate elevation of 1,220 meters or 4,000 feet. The highest known level of Pleistocene Lake Lahontan, at approximately 1,330 meters or 4,362 feet (Benson and Thompson 1987), is about 16 meters or 55 feet below the entrance of the cave. At no time was the cave flooded by the Pleistocene lake. Thus, it was reasoned that evidence of Pleistocene human occupation might be found preserved in early deposits.

At the entrance to the cave is a relatively small rockshelter, measuring approximately 8 meters long north-south by 6 meters deep east-west, formed by the smoothly curving roof and walls of a former chamber of the cavern (Fig. la). The roof and walls are jointed and fractured. The surface of the fill, sloping down towards the rear of the shelter, was covered by rock fragments in silt, with large angular boulders embedded in or resting upon the fill. There was little evidence of recent disturbance in the entrance shelter.

Behind a very large boulder in the northeast part of the entrance shelter is the narrow entrance to the present cavern, with a steep irregular route of 18 meters length descending five meters over a massive high flowstone-coated rockfall to an extensive area of silt fill with some rock rubble and much debris of packrat midden (small twigs and dung) on its surface.

The cavern is impressive, with a gabled roof rising an estimated 10 meters over the surface of the silt fill. The area of the silt fill measured approximately 17.5 meters north-south by 12 meters east-west, with a surface sloping down from north to south, and steep cones of silt and packrat midden banked against the flowstone-coated zones of rockfall (Fig. lb). Parts of the silt fill area were recently excavated by bat guano prospectors or arrowhead collectors. Beyond the area of silt fill is another high massive flowstone formation, and beyond and above this flowstone formation are two very small chambers with some silt fill. Bone fragments observed in these small chambers suggest use as animal lairs, although there is no passable

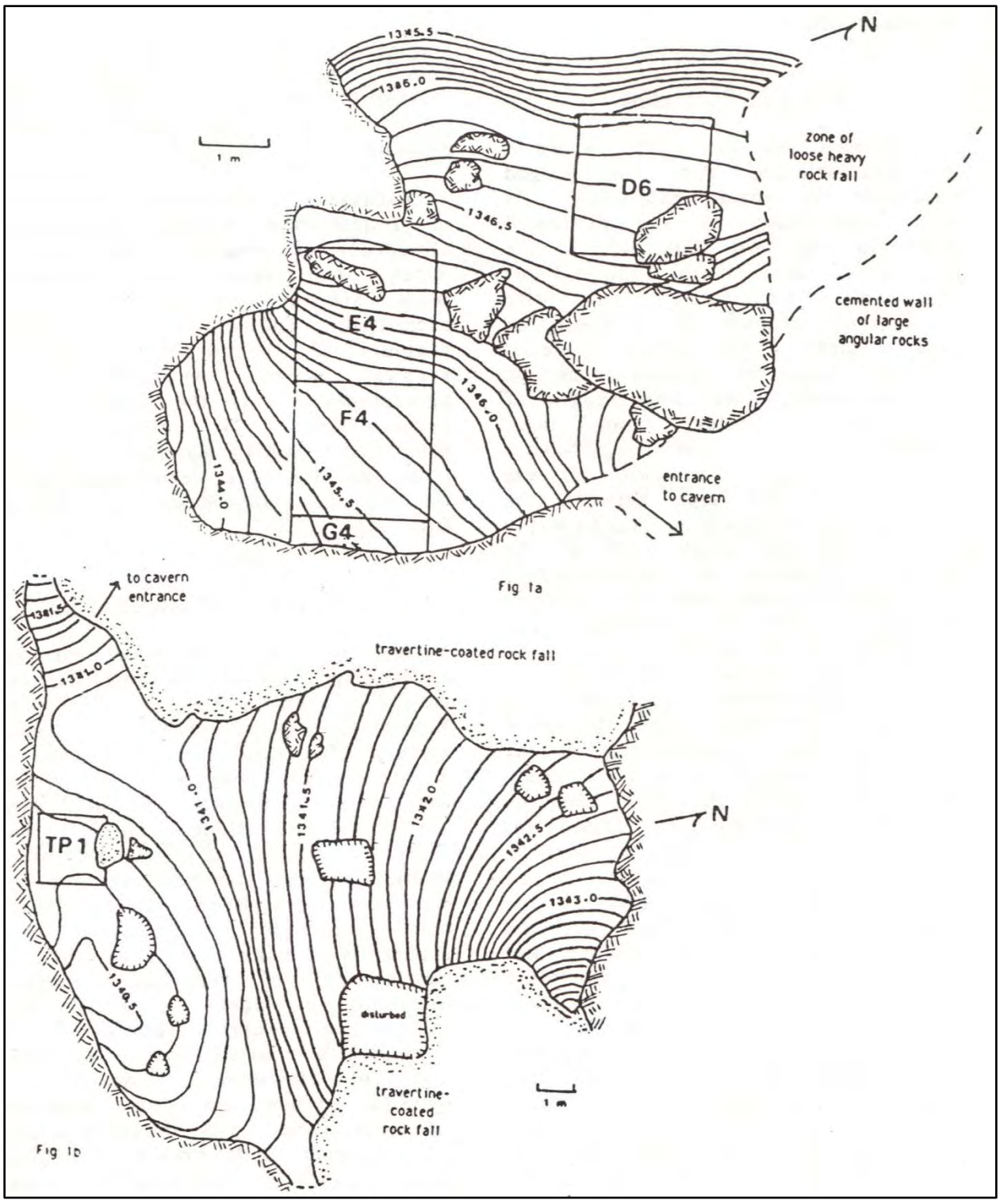


Figure 1a (top): Map of the entrance shelter, Handprint Cave; Figure 1b (bottom): Map of the main chamber in the interior of the cavern. Note variation in scale. Contour interval 10 cm.

rear entrance to the cavern.

In the main chamber of the cavern near the south wall is a large stalagmitic column which had split along its length. On a light smooth surface on the east side of the column is a cluster of about a dozen ovoid smudges of bright red ochre, each roughly about 10 x 12 cm in diameter. Human handprints can also be discerned, a feature that gives the site its name.

METHOD OF EXCAVATION

The main chamber of the cavern is in semi-darkness, and was judged unsuitable for human habitation. As well, examination of the excavated areas in the silt fill within the interior of the cavern indicated no cultural features in the stratigraphy exposed to a depth of over a meter. No cultural material – stone flakes or broken bone of large mammals – was seen on any of the backdirt piles from these excavations. In 1987 a 2-meter square test pit, Test Pit 1, was excavated in the area between the pictograph-bearing stalagmitic column and the south wall of the cavern, to search for any evidence of human activity near this cultural feature, and to examine the stratigraphy of the silt fill.

The excavations conducted in Handprint Cave from 3 June through 1 July 1987 were concentrated in the well-lighted entrance shelter, which should have been the main area of occupation, although no flakes or artifacts were found on the surface. Three 2-meter squares were excavated, one (Square 06) at the edge of the talus slope in the northwest sector of the shelter; and two (Squares E4 and F4) extending eastward from a large rock outcrop at the south end of the shelter into its interior, with an extension (into Square G4) to reach the rear (east) wall of the shelter.

In all areas excavation normally proceeded by use of trowel and dustpan, with materials collected in buckets and screened through ¼-inch mesh. In some instances rock picks were used to loosen materials; and on occasion a fine screen was employed to collect small bone fragments from silt deposits. All bone fragments, coprolites, hair, feathers, and vegetal materials were collected, and are now awaiting analysis.

Excavation procedures attempted to follow the natural stratigraphy as closely as possible. In cases in which stratigraphic zones appeared thick, arbitrary 10 cm units were excavated, following the surface contours of the deposit. Exposed strata were profiled and photographed. At the conclusion of excavation all units were backfilled. All materials collected from the site have been deposited in the Nevada State Museum in Carson City.

NATURAL STRATIGRAPHY

At the front of the entrance shelter, in Squares O6 and E4, the major stratigraphic features encountered were zones of rock rubble in a silt matrix, pockets of disintegrating rock, and a basal zone of very heavy rockfall often coated with flowstone (Fig. 2). The bedrock floor of the entrance shelter was not reached even at the maximum depth of excavation, 360 cm below surface in Square E4, apparently being covered by a massive fall of very large angular limestone

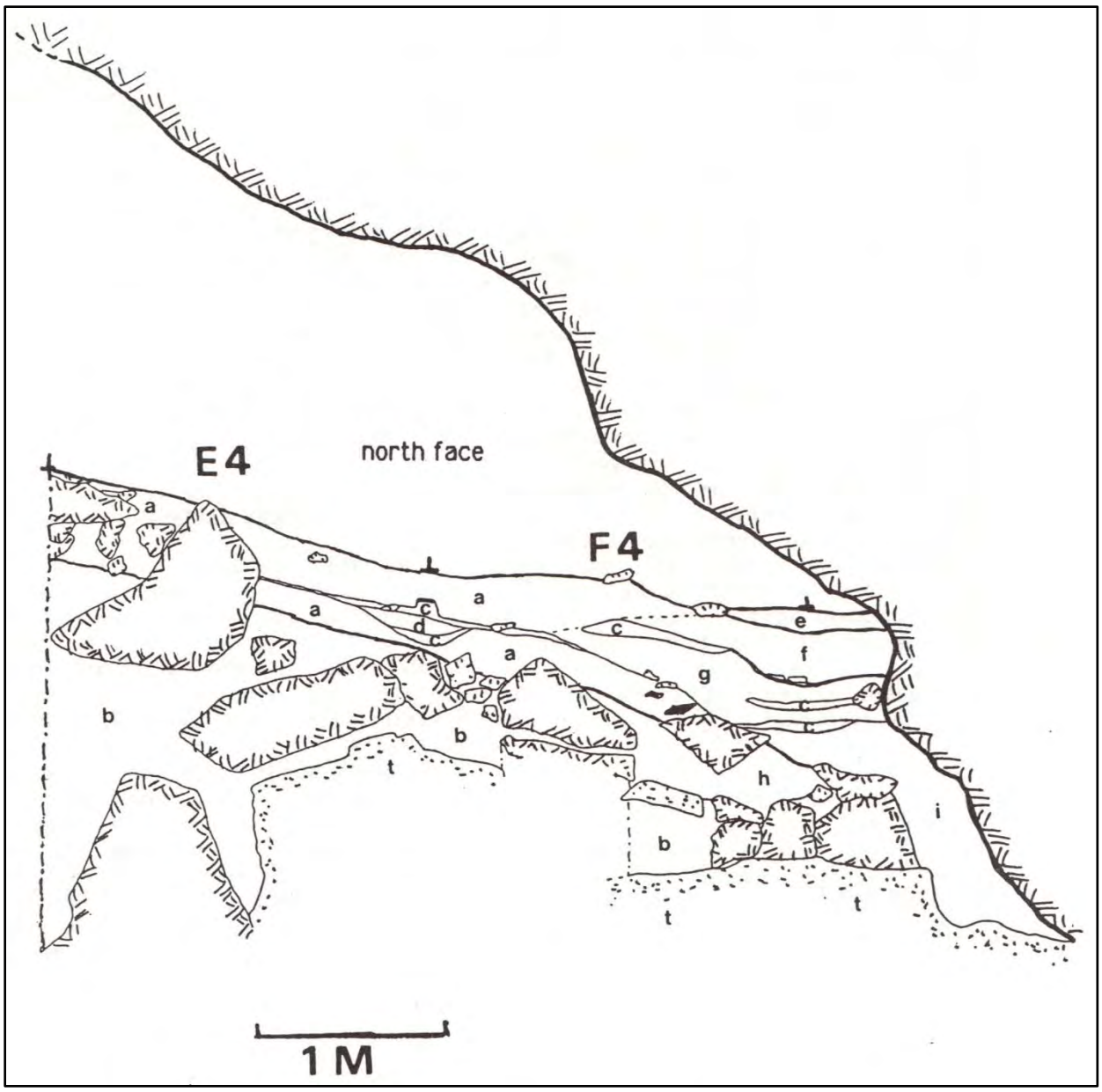


Figure 2. Profile of the north face of the main trench in the entrance shelter, Handprint Cave: (a) rock rubble in brown silt; (b) rock rubble in orange/brown silt; (c) dark grey silt; (d) grey/brown silt; (e) dry buff silt with rubble; (f) grey silt and sheep dung pellets; (g) dark orange/brown silt and rubble; (h) soft orange/brown silt and rubble; (i) soft light orange/brown silt and rubble; (t) travertine-coated rock.

boulders. This first massive irregular rockfall was subsequently coated with a thick layer of flowstone. Later heavy rockfalls broke up this irregular flowstone cover, and crevices among the boulders and broken flowstone filled with disintegrated rock, limestone and travertine fragments, in a matrix of orange/brown silt. Small open voids remained among the rocks in many cases. Later, a zone of rubble in a brown silt ma-

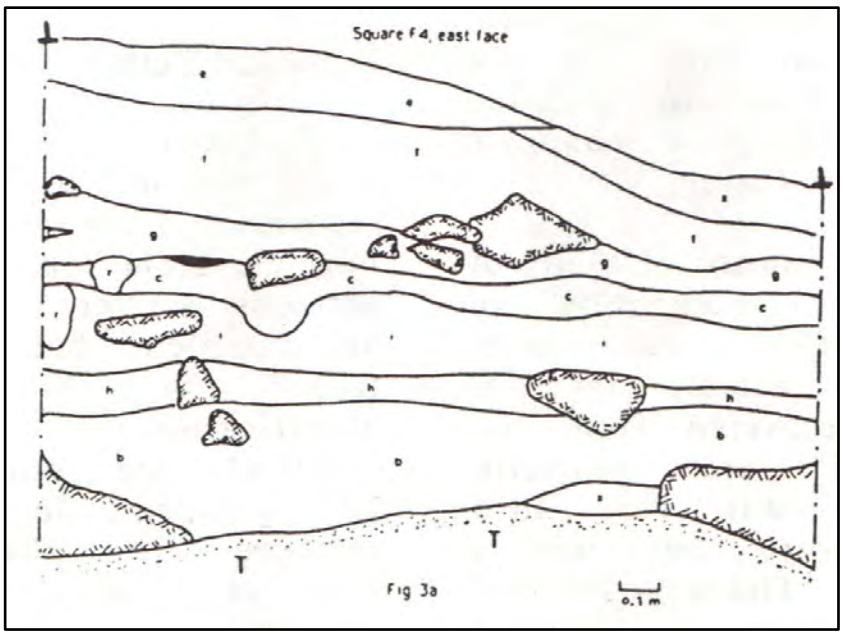
trix, incorporating occasional large boulders accumulated over the zone of heavy rockfall.

Farther toward the rear of the entrance shelter, in Square F4, there was also evidence of an initial massive rock fall coated with flowstone, subsequently broken up by heavy rock fall, with loose limestone or travertine rubble in a matrix of orange/brown silt in the crevices among the large rocks. Near the rear of the shelter, in the east part of Square F4 and in adjacent Square G4, under a very low ceiling, there were overlying deposits of lighter orange/brown silt or grey silt which contained much less rubble (Fig. 3a). Mountain sheep apparently sheltered frequently under the rear wall of the shelter. Sheep dung pellets were abundant in the upper 30 cm of the deposits in this area, and were found occasionally preserved underneath rocks to a depth of 120 cm below surface.

In Test Pit 1, in the interior of the cavern between the stalagmitic column and the south wall of the cavern, the natural stratigraphy was quite different from that in the entrance shelter (Fig. 3b). The upper 50-70 cm of deposit consisted of a fine soft buff silt with very little rubble content. Below this soft fine silt was a deep zone of evidently waterlaid silts and clays. The upper 20-30 cm of this zone displayed fine laminations, but the lower 40-50 cm was very compact grey sandy silt with only a few laminations of reddish clay. A massive rippled dome-like flowstone formation underlay the waterlaid silt, and sloped sharply east and south to the cavern wall. Close to the south cavern wall was a 10-15 cm thick layer of limestone and travertine rubble in a yellow/brown silt matrix, underlying the waterlaid silt and directly overlying the basal flowstone formation. This thin zone of rubble may possibly be related to the second massive rockfall near the entrance to the cavern, and the deep waterlaid silts and clays overlying might represent intervals of ponding in this part of the interior of the cave. The soft buff silt in the upper levels evidently is largely derived from the waterlaid silt zone, with erosion and extensive animal burrowing indicated by the irregular upper surface of the zone of waterlaid silt.

CULTURAL FEATURES

In the entrance shelter, the major areas of human occupation appeared to be situated towards the rear of the shelter, in the more level areas in the southeast zone. In the central part of this area, several small thin lenses of dark-colored silt incorporating occasional small charcoal fragments were exposed in the matrix of rock rubble and brown silt at intervals in the upper 40 cm (Fig. 2); and towards the rear of the shelter there is evidence of ash mixed with dark grey silt or orange/brown silt to a depth of about 85 cm (Fig. 3a). However, definite discrete occupation levels were impossible to identify in the unsorted rubble, and only small concentrations of artifacts were noted. One such concentration of artifacts, all found at a depth of 50-60 cm below surface in the east part of Square F4 and in adjacent Square G4, consisted of two corner-notched points with split stems, a fragmentary corner-notched point, a concave-based point, a drill point, two possible limestone hammerstones, a possible



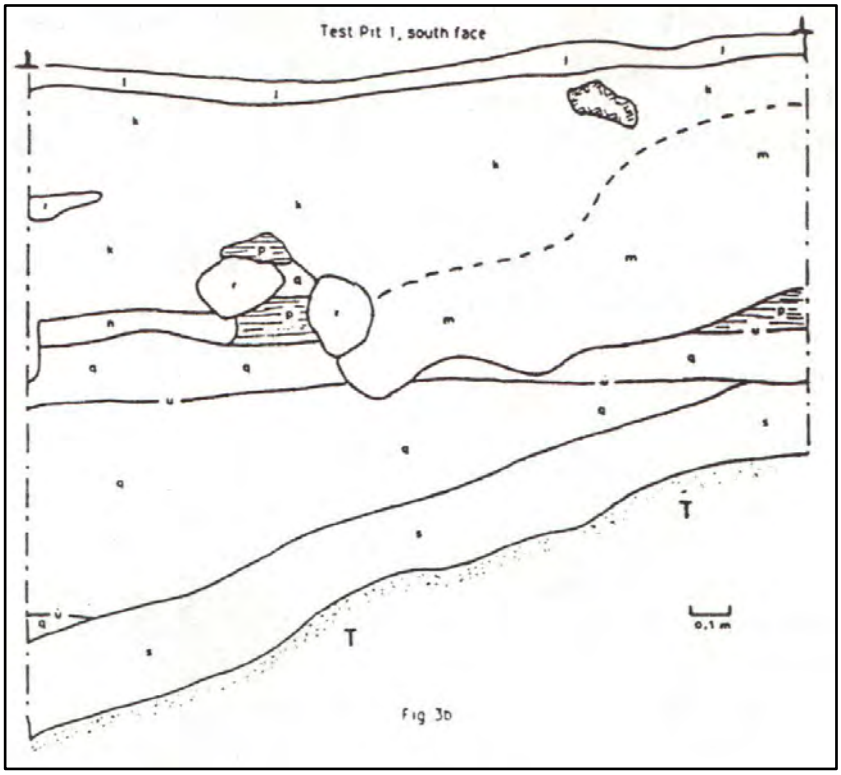


Figure 3a (top): Profile of east face of Square F4, entrance shelter. b, rock rubble in orange/brown silt; c, dark gray silt; e, dry buff silt with rubble; f, grey silt and sheep dung pellets; g, dark orange /brown silt and rubble; h, soft orange/brown silt and rubble; i, soft light orange/brown silt and rubble; r, rodent hole; x, disintegrated rock; T, travertine-coated rock. Figure 3 b (bottom): Profile of south face of Test Pit 1, main chamber of interior cave. j, soft brown silt with some rubble and rodent dung; k, soft buff silt; m, soft brown silt; n, dark brown silt; p, finely laminated grey and reddish silt; q, compact coarse grey silt; u, lines of red clay; s, loose fine rubble in yellow/brown silt; T, flowstone formation.

travertine chopper, and a spall from a waterworn pebble hammerstone. Most finds in the entrance shelter, however, occurred in the rubble, to a maximum depth of 115 cm below surface.

Judging by the small amount of artifactual material, occupation of the entrance shelter was never intensive. It is notable that of the 23 artifacts recovered from this area, over half are projectile points; and there was very little flaking debitage, with only half a dozen unmodified flakes recovered from the site. Bone scrap which could be attributed to human activity is rare – most of the bone fragments recovered are of small mammals and birds, likely the byproducts of raptor activity. We found very few fragments of bone from large or medium-sized mammals.

As mentioned, there was no indication that the earlier excavations made by collectors or prospectors had found traces of prehistoric human habitation within the semi-dark interior of the cavern; and only the pictographs indicated perhaps an artistic or religious use of this area. The soft buff silt in the upper 30 cm of the test pit placed near the pictographs, however, did yield evidence of human activity in the form of much charred wood, hair from a bovid (presumably bison) and a human (Mongoloid) (identified by L. Ozetsky of the Hair and Fibers Division, Forensic Laboratory, Royal Canadian Mounted Police, Edmonton), and two exceptionally fine artifacts: a beautiful stemmed projectile point of white agate, and a large retouched blade-like flake of translucent yellow chalcedony.

ARTIFACTS

Projectile Points

Fourteen projectile points or fragments of projectile points were recovered from Handprint Cave, all but one from the rubble zones in the entrance shelter. Only three points are complete, but only one tip end (found in the backdirt) defies classification. Although none are identical, the projectile points can be grouped in four categories, relating to the technique of hafting: corner-notched with indented or split stem; corner-notched; concave based; or stemmed.

One obsidian point, found in a soft yellow/brown silt lens at a depth of 30 cm in the northwest quarter of Square F4, is most similar to the Elko Eared type (cf. Pendleton 1985: fig 59d). Measuring 34 x 24 x 4 mm, it has a triangular body with serrated edges, marked barbs, and an expanding stem with a deep basal notch (Fig. 4a).

Three obsidian points resemble the Gatecliff Split Stem type (Thomas 1981: fig. 9; Thomas and Bierwirth 1983: fig. 82). These three points, which range in size from 41 x 21 x 4 mm to 34 x 24 x 4 mm, feature a triangular body with straight serrated notches. The stem may be parallel-sided or expanding towards the base, which has a marked indentation or notch. Two of these points came from a depth of about 55 cm below surface in a dark orange/ brown silt and rubble zone in the east part of Square F4 and adjacent Square G4 at the rear of the entrance shelter; one was found in the backdirt.

Two obsidian corner-notched points are too badly broken to ascertain clearly the form of the base; but one with a triangular

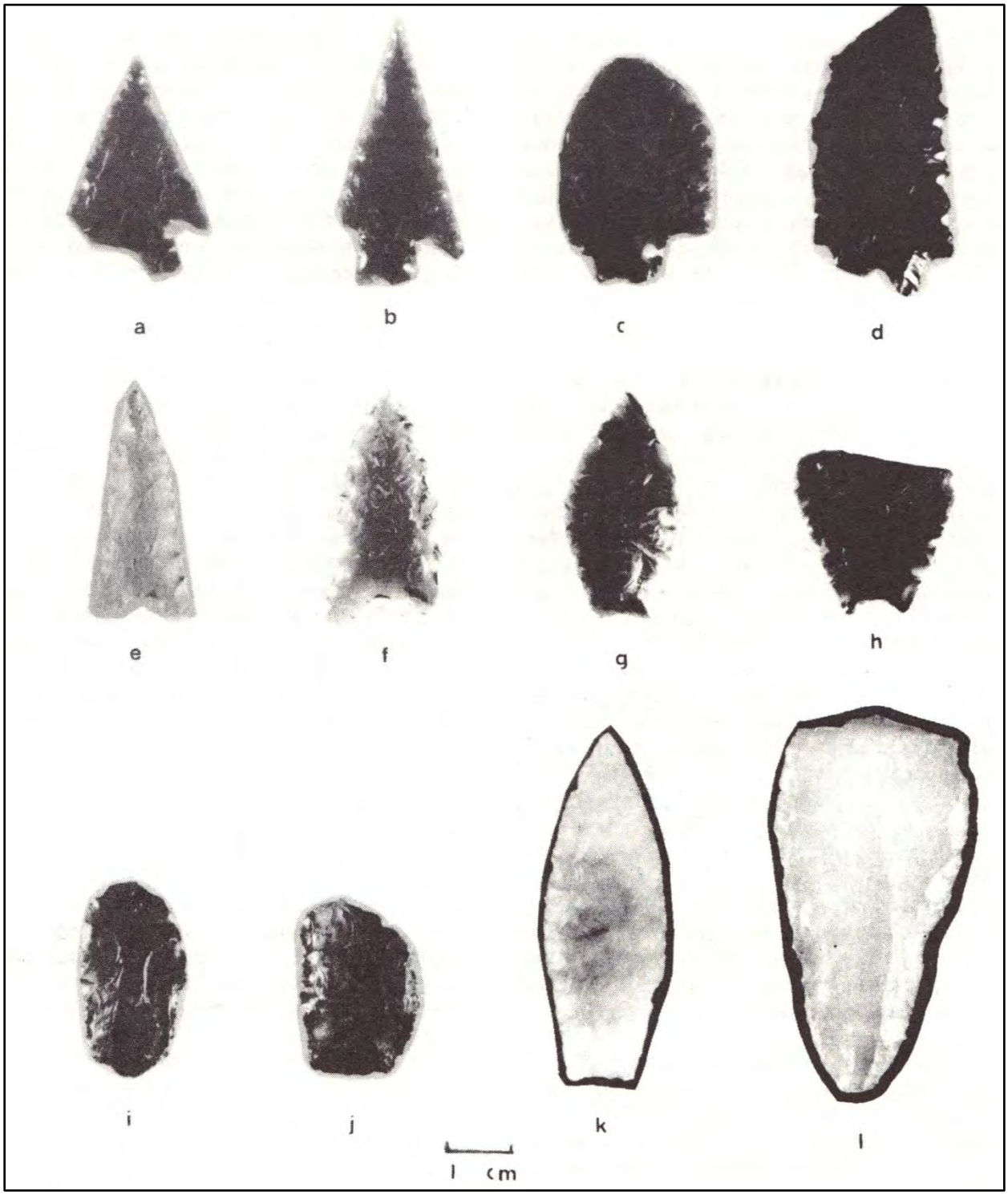


Figure 4. Artifacts from Handprint Cave. a-j, projectile points from the rubble zones in the entrance shelter; k-l, artifacts from the buff zone in Test Pit 1 in the main chamber of the interior of the cavern.

body, serrated edges, and sharp barbs may have had a split stem. It was also found at the 55 cm level in a dark orange/brown silt and rubble zone in Square G4. The other corner-notched point, a smaller specimen which retains only one small sharp barb, came from a depth of 10-20 cm in a brown silt and rubble zone on the west side of Square E4.

Two concave-based projectile points may be assigned to the Humboldt Basal-notched type (Thomas 1981: fig. 5a-k). One, made of a buff-colored chert or rhyolite (?), features a features a narrow triangular body with straight denticulated edges (Fig. 4e). It has a deep basal indentation, and the barbs are slightly asymmetrical. This specimen, which measures 35 x 15 x 4 mm, was recovered from a depth of 35 cm below surface in a brown silt and rubble zone in the northwest quarter of Square E4. The other point, made of obsidian, was found a depth of 95 cm below surface in an orange/brown silt and rubble zone in the northeast quarter of Square F4. Measuring 40 x 18 x 5 mm, it features a triangular body with slightly convex serrated edges (Fig. 4f). It has a deep broad basal indentation, and large slightly flaring squared barbs.

Another obsidian ovate-shaped concave based point, recovered from a depth of 55 cm below surface in a dark orange/brown silt and rubble zone in the northwest quarter of Square F4, may also pertain to the Humboldt series. Measuring 46 x 18 x 6 mm, the ovate body is widest bear the centerline; but abruptly tapers to a very sharp tip. The concave base is shallow, without marked spurs (Fig. 4g).

The basal half of an unusual concave-based obsidian point was the deepest artifact recovered in the entrance shelter, found at a depth of 115 cm below surface in a soft orange/brown silt deposit among large rocks in the northwest quarter of Square F4. Measuring 25 x 25 x 5 mm, it features a very broad ovate body tapering to a narrow base, with a shallow basal concavity and two sharp basal spurs (Fig. 4h).

The category of stemmed projectile points includes three different specimens. One, from a depth of 30 cm below surface at the base of the brown silt and rubble zone in the northwest quarter of Square E4, is a short, thick, blunt ignimbrite point (Fig. 4i), badly impact-shattered and burinated. It appears to have been shouldered, at least on one side, with a round base. It measures only 31 x 16 x 6 mm. Another specimen is the broken basal end of a square-based ignimbrite point, measuring 28 x 19 x 6 mm. One corner of the base is squared; the other is asymmetrical (Fig. 4j). This basal fragment was also found at the base of the brown silt and rubble zone, at a depth of 40 cm below surface in the northeast corner of Square F4. These two specimens might possibly be assigned to the Parman Stemmed type (Layton 1970: fig. 33).

The third stemmed point is a beautifully flaked complete point of white agate which was found in Test Pit 1 in the interior of the cavern at a depth of 0-10 cm in soft dry buff silt. It is lanceolate and symmetrical, with excurvate edges, slight bilateral shoulders, and a slightly concave base (Fig. 4k). There is no basal grinding. The point was shaped by very fine lateral pressure flaking, producing a thin biconvex cross-section. The point is small, measuring 54 x 6

mm, virtually a miniature. It would also seem to fall within Parman Stemmed type.

To summarize, a variety of projectile points was recovered from the rubble zones in the entrance shelter. Three specimens resemble Gatecliff Split Stem points. Two of these points were found at the 55 cm level in dark orange/brown silt with rubble near the rear of the entrance shelter. Another broken corner-notched point which may have had a split stem came from the same horizon. An Elko Eared point was recovered from a depth of 30 cm in the brown silt and rubble zone, and a small broken corner-notched point was recovered from a depth of 10-20 cm in the same zone. Three lanceolate points with concave bases appear to pertain to the Humboldt series. These points were distributed from 35 cm to 95 cm depth in the rubble zones of the entrance shelter. One other broad concave-based point fragment was found at 115 cm depth in orange/brown silt and rubble. There was also a small thick single-shouldered point found at a depth of 30 cm, and a base of a square-based recovered from a depth of 40 cm, both at the base of the brown silt and rubble zone towards the front of the entrance shelter. These stemmed points may be related to the Parman Stemmed type. The fine agate stemmed point from a depth of 0-10 cm in soft buff silt in Test Pit l in the interior of the cavern is also Parman-like.

Drill Point

A drill point made of buff chert, with base missing, was found in dark orange/brown silt and rubble at as depth of 52 cm below surface in the northwest part of Square G4. The tip end has been carefully retouched bidirectionally to form a squared chisel bit, but neither the bit nor the sharp serrated lateral edges exhibit any use wear. The artifact is 44 mm long, with a thick biconvex section, varying in diameter from 8 mm at the base to mm near the tip.

Thin Biface Midsection

A midsection of a thin biface of red-speckled bluish-grey agate was found at a depth of 25 cm below surface in a lens of dark grey silt in the central part of Square F4. Measuring 49 x 33 x 6 mm, the artifact has a flattened biconvex cross-section. It is asymmetrical in outline, as if the original piece had one shoulder.

Retouched Flake-Blade

A translucent lemon-yellow chalcedony flake-blade with bilateral retouch was found in soft dry buff silt at a depth of 14 cm below surface in Test Pit 1 in the interior of the cavern. The flake-blade, which measures 69 x 31 x 6 mm, was evidently removed from a polyhedral core, as there is a central ridge, and the flake-blade abruptly curves inward at the distal end (Fig. 4l). The striking platform is ground. Both lateral edges, which converge toward the proximal end, are steeply retouched, unidirectionally on one edge and bidirectionally on the other.

Retouched or Utilized Flakes

Four of the ten obsidian or ignimbrite flakes recovered from Handprint Cave displayed evidence of retouch or utilization on one or

more edges. These four flakes range in size from 44 x 36 x 5 mm to 33 x 22 x 4 mm. Three were recovered from depths ranging from 10 cm to 70 cm below surface in the rubble zones in the entrance shelter; and one was found in the surface debris in Test Pit 1 in the interior of the cavern.

Possible Limestone/Travertine Tools

Two possible limestone hammerstones or choppers were recovered at a depth of 50-55 cm in an orange/brown silt and rubble zone in the east-central part of Square F4, near the rear of the entrance shelter. These are irregular angular chunks of limestone, measuring 101 x 62 x 73 mm and 118 x 68 x 64 mm, which have evidence of heavy battering or step-flaking on sections of edges. A possible chopper of travertine, found in the same area, is irregular in form, measuring 87 x 74 x 26 mm. Portions of two right-angled edges have been battered. Another possible travertine chopper was found at a depth of 20 cm below surface in a lens of dark grey silt in the northwest quarter of Square F4. This specimen is a rectangular chunk of flowstone measuring 80 x 63 x 64 mm; the cortex has been removed from all areas except the central portion of one face, and one end is heavily battered. Test Pit 1 in the interior of the cavern yielded another possible travertine chopper from a depth of 25 cm below surface, in dry buff silt. This rectangular chunk of flowstone, measuring 81 x 56 x 26 mm, has a plano-convex cross-section and a slightly excurvate edge which has been slightly battered.

Waterworn Pebble Fragment

A spall of waterworn pebble or exotic unidentified material may have been spalled from a hammerstone, as there is a small pecked depression on one smooth face adjacent to the fractured surface. The fragment, which measures 43 x 30 x 11 mm, was found at a depth of 55 cm below surface in orange/brown silt and rubble in the northeast quarter of Square F4.

Modified Wood

Two modified wooden shafts were found on the surface in the interior of the cavern. One is a straight cylindrical wooden shaft (262 mm long and 6 mm in diameter), with one end broken off and the other symmetrically dowelled a distance of 14 mm. The other wooden shaft, 878 mm long with a diameter of 9-11 mm, is a curved cylindrical stick with both ends. broken off rather squarely, and the surface apparently scraped. Despite its curve, the piece would seem too weak to have been used as a bow.

DISCUSSION

Any Pleistocene deposits which might exist in Handprint Cave could not be definitely identified in the 1987 excavations, and no evidence of a late Pleistocene human occupation of this high cave was found. The presence of abundant flowstone in the entrance shelter suggests that the original entrance to the cavern, which would not be likely to have active flowstone, may have collapsed and been transported down the

talus by early Holocene times. After the collapse, there may have been too much heavy rockfall for a comfortable occupation area at the entrance. To judge from the Gatecliff Split Stem and Humboldt series projectile point styles represented in the artifact assemblage recovered from the rubble zones, the major period of occupation of the entrance shelter was late middle Holocene, about 5,000-3,000 years B.P. (Thomas 1981); although two Parman Stemmed points suggest earlier occupations (cf. Layton 1987: Fig. 4; Layton 1972). The stratigraphy in the entrance shelter is complex, and the projectile point sequence is not clearly defined.

A radiocarbon date of 4480±105 B.P. (Beta-22961/ETH-3398) was obtained on charcoal from a depth of approximately 60 cm below surface in the northeast quarter of Square F4 near the rear of the entrance shelter in Handprint Cave. This date relates to the small artifact assemblage which features Gatecliff Split Stem and Humboldt series projectile points.

The nature of the cultural materials recovered suggests that the entrance shelter functioned as an occasional lookout for hunters, who may have rearmed their projectile shafts on the spot but did very little flaking in the shelter. The very low frequency of other kinds of artifacts, as well as the lack of bone refuse, probably indicates that the site was never intensively occupied or utilized by family groups. After the late middle Holocene period it may have been too high for easy access from important activity areas on the valley floor.

The pictographs of a rare type – red handprints – on a stalagmitic column in the semi-dark interior of the cavern are intriguing. A radiocarbon assay of the charcoal from the 10-20 cm level of the adjacent test pit resulted in a date of 10,740±70 years B.P. (Beta-21885). It is possible to speculate that this date indicates the age of this cultural feature, as well as the age of the two fine artifacts which may have been offerings at this special place.

ACKNOWLEDGEMENTS

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CRM Archaeology and the Southern Great Basin

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I read with great interest a recent Society for American Archeology (SAA) Bulletin article by Dincauze (1988) concerning various aspects of the self-study survey of the SAA. Most troubling was her comment that a large percentage of individuals responded with a feeling of hostility and what can be best described as condescension towards practitioners of public or Cultural Resource Management (CRM) archeology. This attitude has been expressed, and reinforced, in print and at professional meetings. Raab et al. (1980) and Wendorf (1979) have described the potential pitfalls and problems of CRM archeology in no uncertain terms. At the 1989 SAA meeting in Phoenix, out of a total of 76 symposia, only two – one on human remains and one on public education – could be said to have originated from the public or CRM side of the profession. In total number of papers, as determined from institutional affiliations of authors, only 7.6% (49 of 641) were either solely or senior-authored by individuals affiliated with CRM firms. Even after adding the government affiliations, CRM-related papers comprised only 14.3% (92 of 641) of the papers presented. This is from an organization whose membership is composed of at least 36% CRM/public archeologists. The message is clear: Public archeologists are second-class citizens at the major professional meetings.

Fortunately, Dincauze (1988) points out several ways in which public archeology supports scholarship and academic archeology:

1) Providing protection for archeological resources;
2) Performing large-scale inventories that no academic institution could provide;
3) Developing funding for new methods of fieldwork and analysis;
4) Testing models developed in academia of past human lifeways against large new data bases;
5) Providing provenienced artifact collections for academia to use in teaching and research;
6) Providing training and employment for a new generation of students in academia;
7) Providing career tracks and opportunities that academia cannot accomplish; and
8) Creating new interest and awareness among the public, thus providing archeology with a new constituency.

The purpose of this paper is to present data from the southern Nevada region in specific support of some of Dincauze's contentions. Data from the Nevada Department of Transportation (NDOT) and the Division of Anthropological Studies (DAS) of the

Environmental Research Center, University of Nevada, Las Vegas, will form the backbone of this paper. These two organizations conduct a great deal of the archeological research in southern Nevada. Additionally, the author is most familiar with these organizations. For support of my propositions I also refer to work in southern Nevada by other firms, most prominently the Desert Research Institute (DRI) of the University of Nevada System and Intermountain Research (IMR) in Silver City, Nevada.

THE ORGANIZATIONS

Southern Nevada is herein arbitrarily defined as consisting of Clark, Lincoln, Nye and Esmeralda Counties. This actually extends the study area into central Nevada, and covers about one-third of the state.

The NDOT, although a state agency, operates much like an independent contractor. It is mandated by federal law to inventory cultural resources on public lands within highway rights-of-way. At the present time, NDOT hires archeologists on a contract basis, placing them under contract to NDOT but not making them permanent state employees. Thus NDOT combines features of both private contracting firms and government CRM specialists.

The DAS, although attached to the University of Nevada, Las Vegas, survives solely on its ability to bid on and win contracts. DAS also serves as southern Nevada's center for reports and site records, and curates in UNLV's Museum of Natural History the artifacts collected during testing and excavation projects.

THE DATA

The time frame for this paper consists of 1983-1988, a period chosen because it coincides with my term as Director of DAS, and is the period for which I am familiar with the scope and quality of work conducted there. Also the records for these years are in particularly good shape for both organizations and thus serve as a good baseline data set for this study.

In this period, NDOT has surveyed approximately 40,095 acres of highway right-of-way in southern Nevada. The acreage ranged from a low of 2,686 acres in 1987 to a high of 14,159 acres in 1984. In this period 262 archeological sites were recorded. Of this total, 233 were prehistoric, ranging in age from the Lake Mojave period (ca. 12,000-7,000 yrs. B.P.) to the late Paiute/Numic period (ca. 850-100 yrs. B.P.). Site types included isolated artifacts, small and large lithic scatters, base camps, rockshelters, rock feature sites, pithouses, roasting pits, quarries, hunting blinds and petroglyphs. Sites have been recorded in every floral and biotic community ranging in elevation from valley floor (Creosote bush/Sagebrush) to higher elevations (Pinyon/Juniper). In addition, 29 historic sites have been recorded, including railroad construction camps, railroad berms, dumps, towns or sidings, cabins, graves, mining camps, roads and isolated artifacts.

NDOT has not been involved merely in a mindless search for locations, but has undertaken three testing programs in this period. The first was at Mainline Junction or Millers, in Esmeralda County, a site associated with the Tonopah and Goldfield Rail-

road around the beginning of the twentieth century (1907-1914). Although aimed mainly at determining the eligibility of the site for nomination to the National Register, NDOT archeologists attempted to deal with problems such as evidence of possible ethnicity at the site and the physical and cultural make-up of a typical "company town" associated with western railroads at this time (Knight 1985).

The second site, Skylight Shelter (Matranga 1985), was a small rockshelter located in a highway right-of-way in Nye County. It was tested because of potential impacts to the site, and to determine its eligibility to the National Register of Historic Places (NRHP). It was discovered that the site contained a Fremont component, which raised some interesting questions concerning the presence of Fremont peoples in central Nevada. The NDOT project also considered questions of chronology, site function and settlement and subsistence.

The third project consisted of a testing program at a site called Bead Bench, in Lincoln County. This Fremont village site, not completely written up yet, is capable of shedding more light on the Fremont occupation of eastern Nevada, and should make interesting reading.

In this same period, DAS has surveyed 19,493 acres in southern Nevada, in projects ranging in size from small drill pads to large-scale sample surveys in the Las Vegas Valley and eastern Clark County. Yearly totals ranged from a low of 849 acres in 1988 to a high of 5,870 acres in 1986. A total of 424 sites were recorded, the overwhelming percentage of which are prehistoric, ranging in age from Lake Mojave to the late Paiute/Numic period. Types of sites include all the same type as were recorded by NDOT, and in nearly every conceivable biotic zone in southern Nevada except for alpine and tundra. In addition to the surveys, testing or data recovery for the purpose of the mitigation of negative impacts was conducted at 41 sites.

A number of the projects run by DAS had wider goals in mind than just clearances. A three year survey of portions of the northern and southern Las Vegas Valley was concerned with discerning the settlement/subsistence patterns of the prehistoric inhabitants of the region through time. Year 1 examined mainly Virgin Anasazi and Paiute and Lower Colorado River groups that resided in the area. Year 2 concentrated on the Lake Mojave period, while Year 3 examined potential patterns of resource exploitation and residence in the northern valley (see Rafferty 1986 for a summary). These survey data have where possible been amalgamated with data from other projects in the Las Vegas Valley. All of this work has aided in expanding our knowledge of the Las Vegas Valley and patterns of prehistoric activity in the region (see also Rafferty and Blair 1984a, 1984b, 1987).

DAS and NDOT are not the only organizations doing work in the region. As of 1984, the Desert Research Institute's work on the Nevada Test Site had surveyed 10,790 acres, recorded 178 prehistoric and 6 historic sites, and tested 30 of these for chronology, subsistence, resource procurement, trade and other problems (Pippin 1984). In addition, DRI's survey of the Groom Mountain Range area that was originally illegally seized by the Air Force re-

sulted in 13,600 acres being surveyed and 265 prehistoric and historic sites being recorded (Reno and Pippin 1986).

Archeological Research Services surveyed portions of the Mormon Mountains, examining 15,040 acres and recording 239 sites (Rusco and Munoz 1983). In addition, IMR excavated seven sites in the Panaca Summit area of eastern Lincoln County, examining site function, artifact variety and patterning, settlement/subsistence patterns, chronology and trade. This area was exploited by Fremont groups, and the research shed new light on the functioning of this culture in the eastern Great Basin (Elston and Juell 1987).

There have been other large projects that have covered major areas of the study zone. Most prominent, and most unfortunate, were the MX surveys which covered 8,480 acres, recording 77 sites and 138 isolated artifacts. Due to the failure of the Air Force to commit itself to a proper analysis and write-up of the data, a full examination of the data and its implications for our understanding the prehistory of southern Nevada have not been realized (Holmer 1983).

This cursory overview reveals that CRM has more than satisfied several of Dincauze's (1988) criteria: Large scale resource surveys, new or more detailed methods of fieldwork and analysis, the examination of models concerning human lifeways, training students, and employing archeologists who otherwise would be unemployed. Contract archeology and contract archeologists have recorded the grand majority of sites in southern Nevada, which are plentiful: 4,099 in Clark County, 799 in Esmeralda County, 5,585 in Nye County, and 3,864 in Lincoln County. These data are available for use by academics, students and other researchers. In fact, several Master's theses from the Department of Anthropology at UNLV have employed portions of the data quite fruitfully (cf. Blair 1986; Myhrer 1986; Tullis 1984). This is just a small example of what CRM or public archeology can offer academia.

SOLVING THE PROBLEMS BETWEEN ACADEMIA AND PUBLIC ARCHEOLOGY

The data base and health of the profession depends in a large way on the health and vitality of the public archeology sector. All of us can recite the legends about poorly conducted or incompetently executed work conducted by contractors. By the same token, many academic projects suffer from the same level of poor execution, and it is not unheard of for artifacts from sites to collect dust in academic institutions for 10-15 years before they are analyzed and written up. As Fowler (1986:176) eloquently wrote "We've learned to our sorrow, if not our surprise, that bad archeology is bad archeology, whether done under the guise of academia, or of CRM."

What can be done to at least reduce the problems between the two sectors of our profession? Others have written about the need for more detailed training, particularly in theory and ethics, and these suggestions are all fine and good. But the problem is more basic than that; it is one of respect. First, I believe that some academics need to realize that in many cases the public arche-

ologists out there are their students who received their first training and grounding at the very institutions where it is fashionable to bemoan the sorry state of public archeology. If some contractors show little or no technical competence and just as little theoretical expertise, it should be remembered who put them out there in the first place. It can and should be a humbling experience.

Secondly, additional training not traditional to archeology should be instituted. Courses in CRM, proposal writing, environmental and archeological law, administration and business management would be most useful. With 36 percent of the membership of the SAA being in public archeology, and fewer job opportunities in academia opening up, the need for this type of training increases every year (cf. Schuldenrein 1988). Particularly, courses in ethics and archeological professionalism to reinforce the SAA/SOPA codes are needed desperately.

Thirdly, students should be encouraged to take summer jobs or part-time jobs with CRM firms or government agencies, if possible, and incorporate those experiences into the academic side of their training. A detailed examination of these experiences by the students and their mentors would be invaluable in defining new roles in archeology, dealing with unexpected and difficult ethical situations that occur, and would provide both student and professor with invaluable experiences. The Department of Anthropology at UNLV has recently instituted an internship program in conjunction with the local BLM office, granting students academic credit for work accomplished. This is an excellent start that could be applied at many other schools, particularly in times of tight federal budgets. Federal agencies are continually short-handed and understaffed, and would welcome such arrangements that would help them to accomplish their missions.

Academics and CRM specialists should also interact on the teaching level. Every department of anthropology should make use of CRM contractors and government archeologists as guest lecturers or adjunct faculty to talk with students about the benefits and pitfalls of contracting. In these times of tight budgets and reduced teaching staff, the contract archeologist could prove to be invaluable in passing on knowledge to a new generation of students.

In conjunction with the above approach, academic archeologists should make more effort to use the data generated by CRM archeologists. Every state in the west has a single repository, or series of repositories, in which report and site data are stored. Almost every BLM, Forest Service and other federal agency office also contains records pertinent to their management area. Contractors are required by their federal permits to deposit reports from their work with the relevant federal office in a timely manner. The data are available to all qualified archeologists, with relatively little effort. If more attempts were made by academic archeologists to employ the data, they would soon come to realize how valuable the data gathered by public archeology truly are.

These are just a few suggestions that I believe can help make all of our lives easier and foster greater understanding between the two sectors of our profession. It would be tragic if this rift, real or imagined, were to

be allowed to continue. We need all the members of our profession to be united in order to deal with all the challenges currently facing us. If we are not united, then our enemies in congress, state legislatures and the business community that we know we have will walk over us and render us impotent. As Lincoln said, a house divided against itself cannot stand. Our internal bickering threatens to undo the progress of the last twenty years, and if that happens, we need look no further than ourselves to determine who the culprits are.

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Railroad Waterworks at Argenta, Nevada

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During the course of a cultural resource survey conducted in the vicinity of Argenta, Eureka County, Nevada, for Gold Fields Mining Corporation, an old water works system was recorded in Water Canyon. The system is alluded to in a 1903 survey as supplying the Southern Pacific Railroad which came through the area in November of 1868. The gravity-feed system consists of a water source at a spring in the canyon, a sedimentation box, and associated iron pipe. Archaeological investigation of railroad resources can help us "understand the construction methods and maintenance requirements of railroads operating in Nevada's hostile environment" (Adkins 1991:8-49). The system represents water works engineering principles adapted to a local situation, and may be the only recorded example of its type from this period of early railroading in Nevada.

INTRODUCTION

The discovery of gold in California in 1848 and subsequently of gold and silver in Nevada in the 1860s, coupled with the westward migration of easterners, created the need for a transcontinental railroad. Five likely routes were surveyed between 1853 and 1856 resulting in a comprehensive study of 13 volumes. By 1861, the need became urgent with the advent of the Civil War. The Central Pacific Railroad Company of California was incorporated in June of 1861 and, in November of 1862, only four months after President Lincoln signed the Pacific Railroad Act, a contract was signed between the United States Government and the Central Pacific for the construction of a railroad line over the Sierra Nevada and across the Great Basin (Earl 1991; Myrick 1962).

Railroad service was established between Reno and Sacramento on July 6, 1968. In 1868, stations were established at Winnemucca in October, and at Reese River Station (Battle Mountain), Argenta, and Carlin between November and December. In December of 1868, the Central Pacific established an eating station at Argenta.

Silver was discovered in the vicinity of Argenta about 1867, but a limited amount of mining activities were carried out at the north end of the Shoshone Range where the Argenta mining district is located. With the completion of the Central Pacific to this point, a post office was established at Argenta. A town began to develop at the site (Stager 1977), and the Central Pacific began an overland freight line to Austin (Paher 1984). However, the Reese River siding, located about 5 miles west of Argenta station, proved to be more advantageously located to serve the mining districts of the

Reese River Valley and particularly the operations at Austin. In 1870, the entire town of Argenta, buildings and all, were moved to the vicinity of the Reese River siding, to be known thereafter as Battle Mountain. Nevertheless, Argenta remained as a siding on the Southern Pacific Railroad, serving as a loading point for barite ore (Stager 1977).

During the course of a cultural resource survey for the Gold Fields Mining Corporation, the remains of a water works that supplied water to the siding at Argenta was identified and recorded. In the field notes of Henry Turtell's 1903 Survey 229, he commented that the "mountain range is drained by a deep canyon in the western part and a small creek utilized by the S. P. Railroad Company to pipe water to its tank in Section 5" (1903:138).

SITE DESCRIPTION AND DISCUSSION

The site (CRNV-12-10848 [BLM]) is situated in and along the lower reaches of the main drainage in Water Canyon (Figure 1), and consists of the historic water works, as well as a prospect with associated trash, and a sparse to medium lithic scatter composed of basalt, chert and obsidian debitage, tools, groundstone, and two rock alignment features whose historic or prehistoric affiliation is uncertain.

The prospect is located at the lower (north) end of the site and consists of the sampling of a rock outcrop and trash that includes seven tin cans, six fragments of glass, milled lumber fragments, a smashed, gray enamel-ware basin, and bailing or electrical/telegraph wire. One intact condensed milk can be dated to 1915-1930, and a clear glass jar bottom contains the trademark for the American Bottle Co. at Streator, Ill., which used this particular trademark between 1905 and 1916.

At the upper (south) end of the site is Feature 3, a mound constructed of earth and rock (Figures 2 and 3). It is situated on the east side of the stream. There is a 3" diameter iron pipe (Pipe "B") protruding from the mound and pointing downstream. In front of and below the pipe is a horizontal iron grate that measures 21" x 60" and is perforated with 0.5" diameter holes. Beneath the grate is a silted-in "cistern," of unknown depth. A 3" diameter section of pipe (Pipe "A"), which may be connected to the cistern, can be seen rising vertically from the creek about three feet downstream. Pipe "B" rests on a section of 3" diameter pipe (Pipe "C"). Another section of pipe (Pipe "D") lies atop these. A trowel probe immediately in back (south) of where Pipe "B" exits the mound revealed that Pipe "B" extends into the mound at least 30".

It's placement and the placement of rocks around it suggests that this configuration is intentional. Pipe "C" appears to be part of this configuration serving as a support for Pipe "B". However, Pipe "D" appears not to be *in situ.* Still another pipe, located on the upper part (eastern side) of the mound, has been placed in the ground vertically and is thought to be associated with another feature, Feature 2.

Feature 2 is a fence constructed of used sections of 2.13", 3", and 3.75" diameter pipe strung with barbed wire. Consisting of two parallel rows of pipe, it runs on both

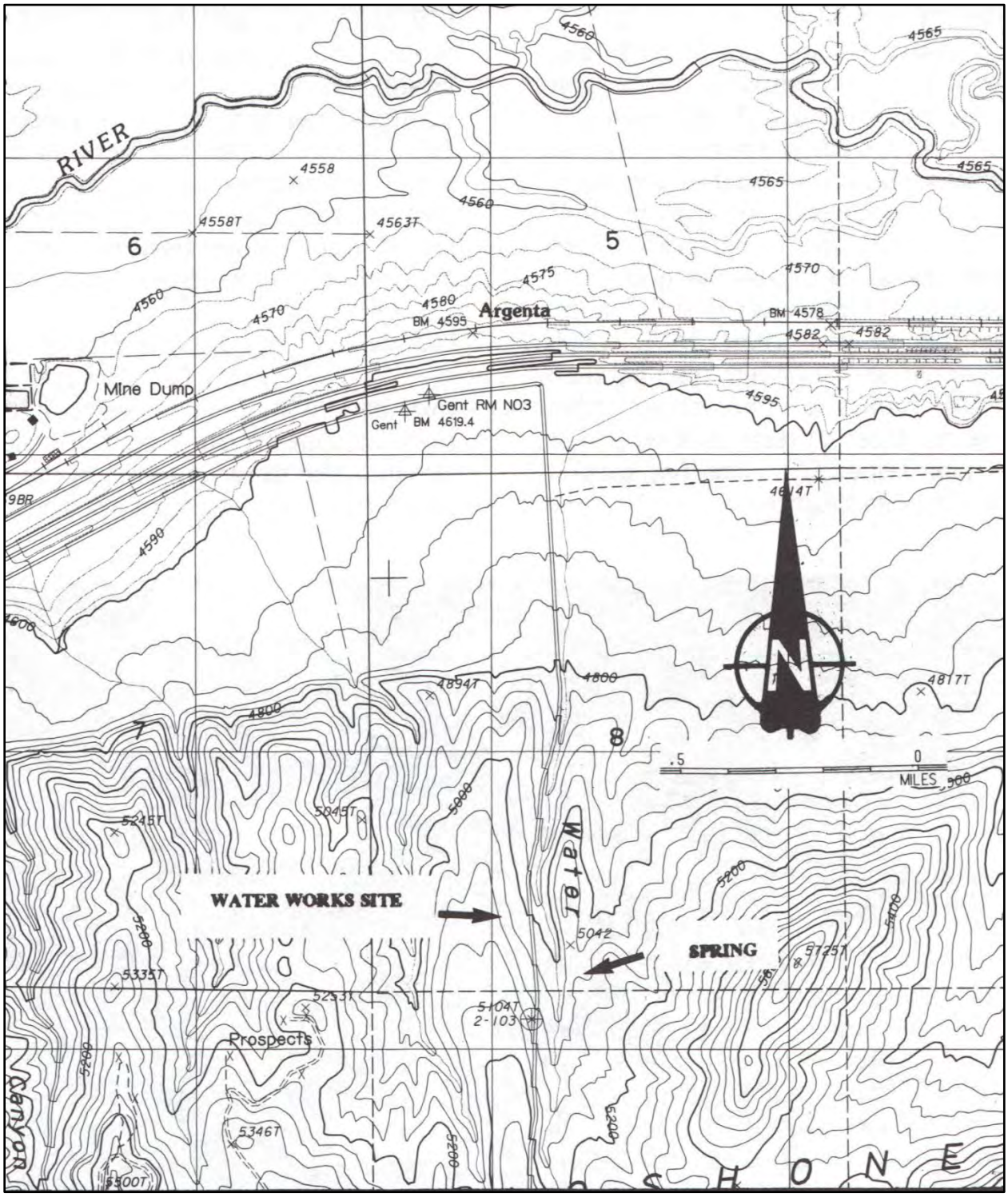

Figure 1. Topographic location of water works site and Argenta Station. Argenta NV., USGS 7.5', 1985.

Figure 2. Feature 3, view south showing modified spring with outlet pipe (B) and grate that covers "cistern." Scale: 30 cm.

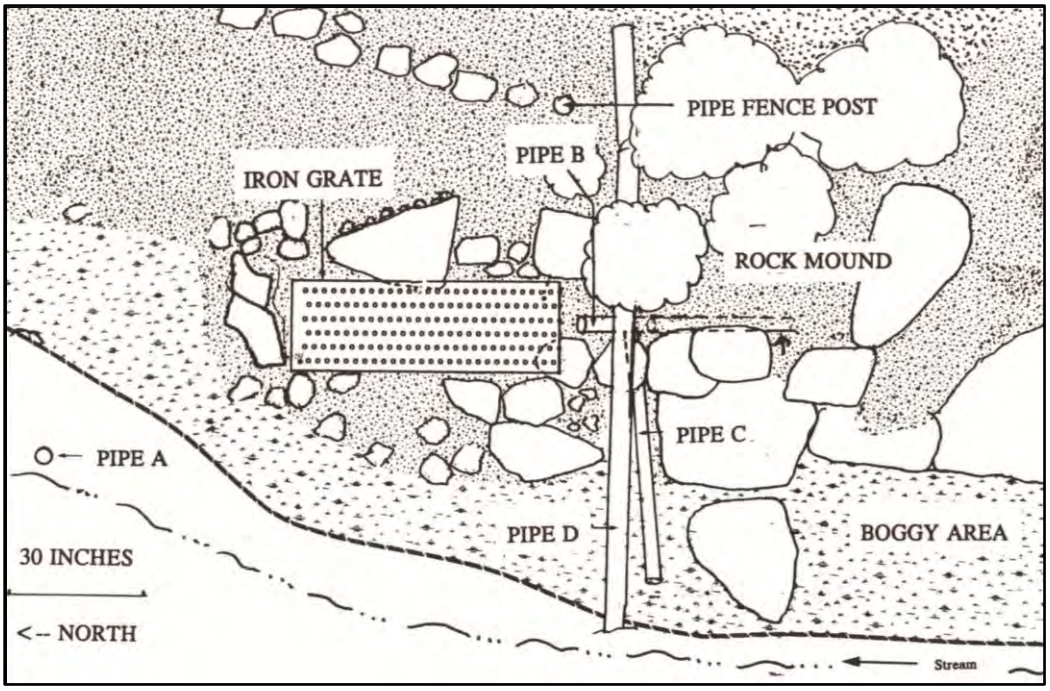

Figure 3. Planview of Feature 3.

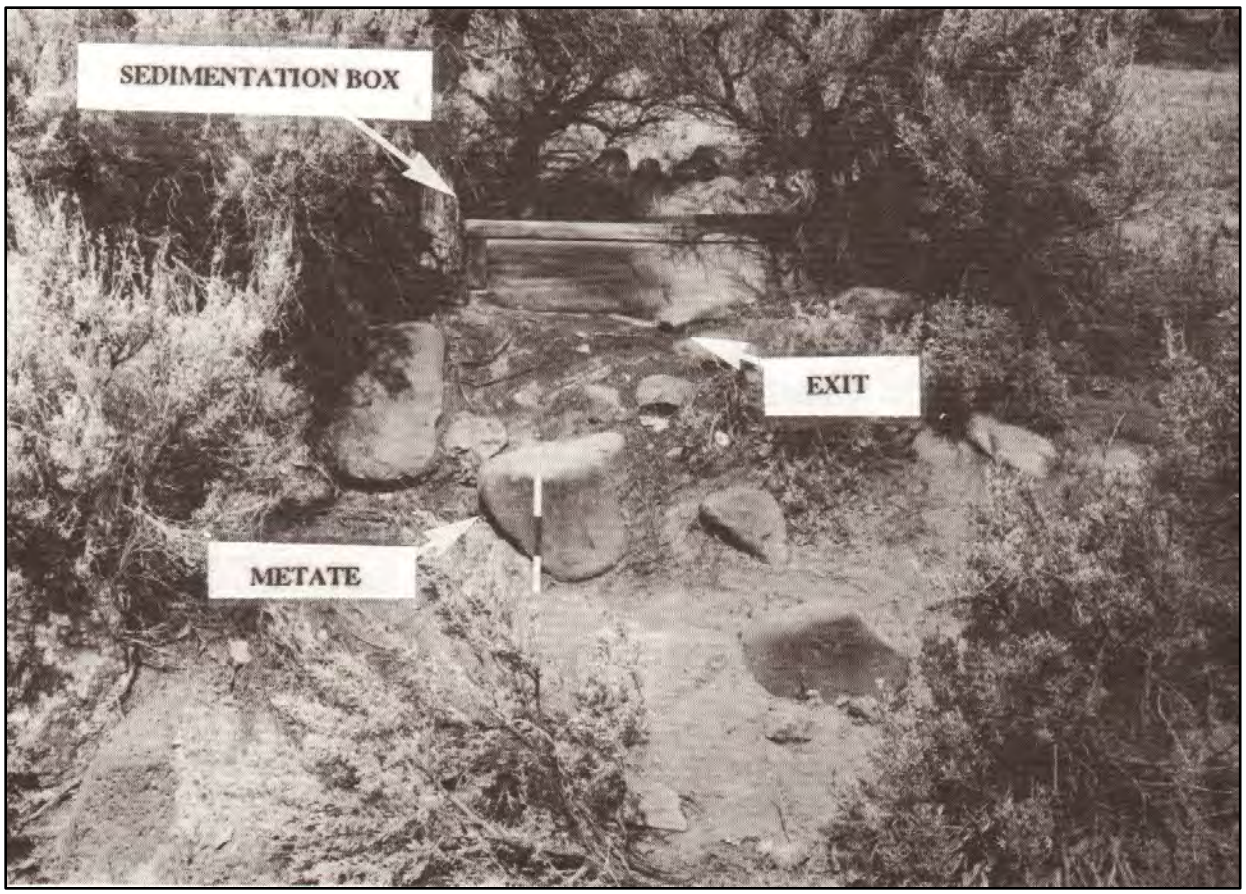

Figure 4. Feature 1, view west showing sedimentation box, exit hole, and stone-lined embankment including boulder metate. Scale: 30 cm.

sides of the stream. The distance between the two rows is only 6 to 9 feet. It begins just above (south of) Feature 3, and continues downstream for about 65 meters. Twenty-one pipe segments are still *in situ.* At the lower end of this feature the direction of the steam bends slightly to the east, and several such lengths of pipe are scattered along the drainage for another 40 meters. Some of this pipe is 3.75" diameter riveted iron pipe fabricated from 24" segments and coupled with a sleeve, while the majority is threaded iron pipe, using threaded couplings and having a visible longitudinal seam.

Feature 1 is a large wooden box, sections of iron pipe and associated trash located on the west side of the drainage at the point where the stream bends to the east before resuming its north-trending flow. Trash associated with this feature consists of a sieve or filter made from a flattened tin can and measuring 8" x 14" with holes made with a knife; a tar container made from a 10" diameter can with a makeshift bailing wire handle; a modified single lap seam 603x700 (#10) tin can with 0.13" wire handle used for a bucket; milled wood fragments; and sections of iron pipe including one wrapped

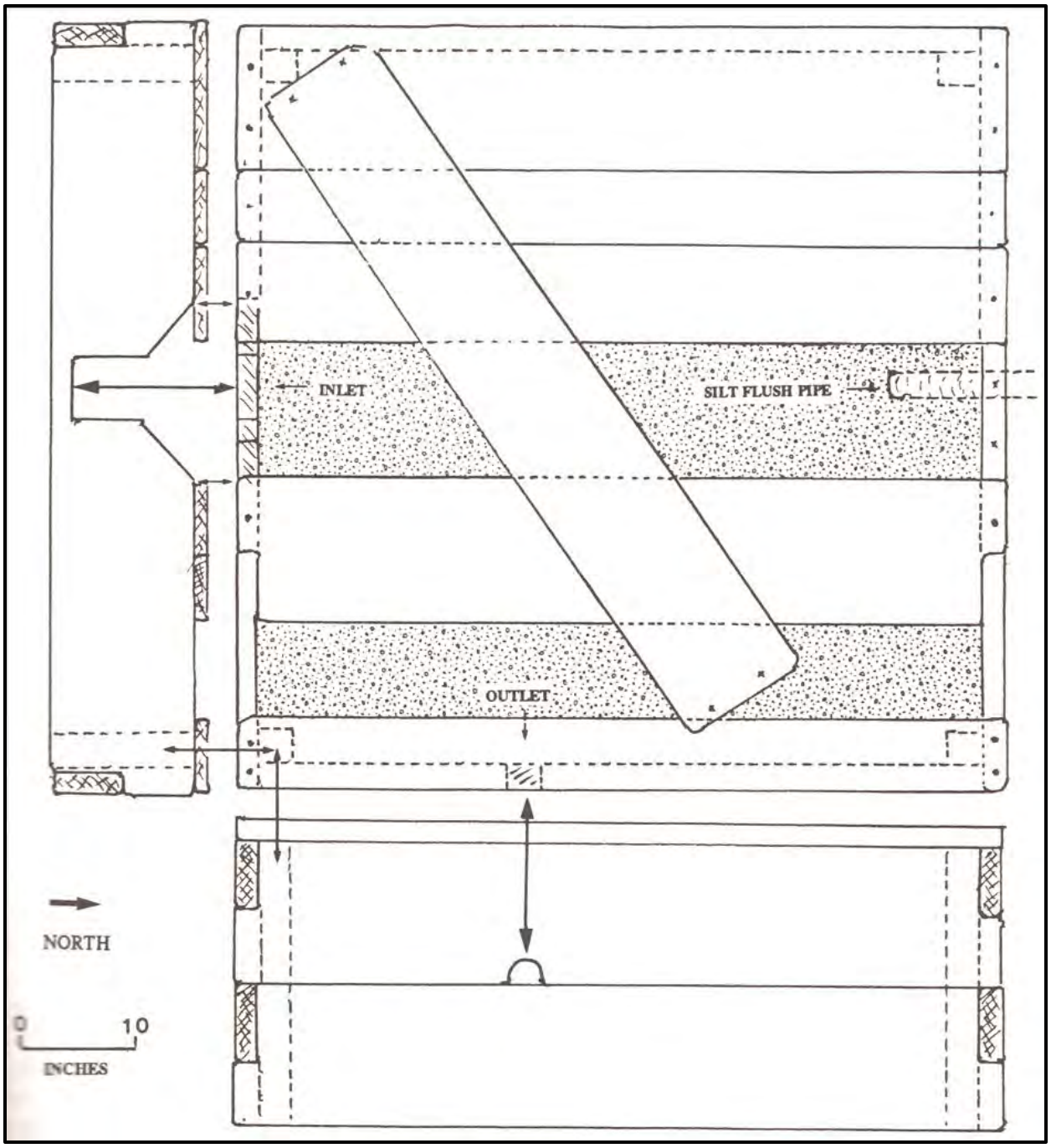

Figure 5. Feature 1, planview of sedimentation box depicting south (inlet) and east (outlet) facing sides.

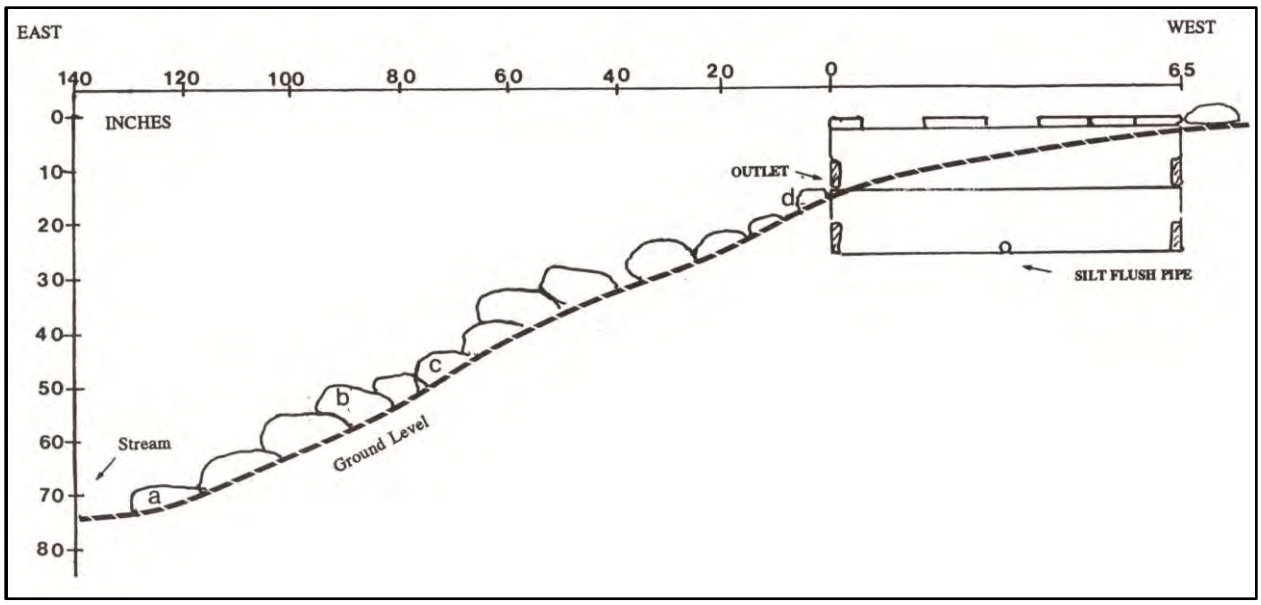

Figure 6. Feature 1, elevation of sedimentation box depicting outlet, flush pipe, and stone-lined embankment.

with rubber and wire. Tar was noted on some of the pipe joints.

The box is built into the cutbank and is constructed from 2" planks having widths of 12", 8.5", and 6.5" (Figures 4 and 5). The planks have been cut with either a longsaw or, more likely, a reciprocating millsaw. The covered box measures 66" x 65" x 24" deep and has an earthen bottom. On the south face, facing up stream towards Feature 3, is a notch cut to accommodate up to a 5" diameter pipe. The base of this pipe would be 10" from the top of the box. A trowel probe revealed a section of iron pipe, probably 3" in diameter, running from the bottom of the interior of the box to somewhere downstream (north) of the box. All nails appear to be 3.38" or 4.5" wire nails. Set around the box is a structure of boulders leading downslope to the level of the stream bed. Included among these boulders is a boulder metate.

Features 1 and 3 are apparently components of an old water works system that is alluded to in the 1903 Turtell survey and which served a water tank at the foot force of water falling from a given height). However, based on an informal calculation using a contractor's transit and tape measure, the sediment box is 18.04 feet below Feature 3.

The flow of water in a head race is controlled at the mill end with a gate. When the gate is closed there is no appreciable flow because the raceway has a zero-degree grade. When the gate is opened, the water flows at a rate dictated by how much water is allowed to flow through the gate. The gate at the end of a raceway is a hand operated "valve." The water works supplying the Southern Pacific Railroad water tank appears to have been designed to operate continuously, unmanned, except for occasional maintenance. Thus, a grade to the supply pipe of more than zero degrees was necessary in order to ensure continuous flow, but it could not have a pitch equal to the actual fall of the river between those two points,

which is about 23 feet.

In order for the box at Feature 1 to function as a sediment settling tank, water flowing into it had to replace water flowing out of it without churning up the sediments which were settling to the bottom. The inlet pipe on the south side of the box would be two inches higher than the outlet pipe coming out of the east side of the box (refer to Figure 5). Apparently it was also significantly larger in diameter. This configuration would guarantee that the water level in the box would be just above the outlet pipe. In fact it would seem, given the 18 foot fall and relatively large diameter of the inlet pipe, that too much water would enter the box. But, since the outlet pipe ran from the box down to the railroad's water tank, a fall of about four hundred feet over approximately 1.3 miles, a siphon effect might have balanced the system. In addition, the pipe located at the bottom of the box on its north face also drew off some water.

Apparently this lower pipe is similar to the arrangement on many mill pond dams which not only have a gate at the top of the dam to supply a flume or head race, but one at the very bottom through which sediments collecting at the bottom of the mill pond can be "blown" out. Again, such a purge gate on a mill dam is operated manually and only occasionally. The lower pipe on the inside of the box had no valve but was just open. Though it passed out of the downstream (north) side of the box underground, it appeared to be more or less level. Such a configuration would guarantee the relatively slow but continuous purging of sediments from the bottom of the box. The exit end of this pipe was not located but would have to be far enough downstream from the box that it would not undermine the embankment near the box or, if near the box, would have to spill down a rock-lined embankment for the same reason. Thus, the whole sediment purging operation would also be automatic.

Streams are notorious for eroding their banks. Most water-powered mills constructed along the banks of streams or rivers make use of rock bulwarks to retard such erosion. The rock structures associated with the sediment box is such a bulwark. Zero-grade earthen head races also have an overflow spillway, similar in principle to the design of bathroom sinks, to ensure that water in the raceway does not overflow and erode its sides. Water from the "silt flush pipe" may have been channeled back to the creek through rocks a-c illustrated in Figure 6. Indeed, the rocks and earth mound at Feature 3 was probably built to protect the spring and pipe against the rampages of the Water Canyon drainage.

The presence of riveted and continuous seam iron pipe point to the likelihood that pipe was replaced during the period this site was in operation. Riveted pipe is common to 19th century sites, while welded, continuous seam, threaded pipe is later. The fence built of discarded pipe sections is curious. The fact that it surrounds and then continues downstream from Feature 3 suggests that it was built to protect the water source, perhaps from the destructive roaming of cattle. It was obviously built later than the original water works, but it is not clear whether it was built to protect the water works while it was in service, or for some other reason.

Except for erosion due to the periodic rampages of the Water Canyon creek, the

water works components are surprisingly intact. Only the pipeline, sections of which are strewn all the way down the drainage to the valley floor, has been destroyed. What does remain is two of the three main components of the system, the pipeline being the third. They represent the adaptation of unchanging engineering principles to the ever-changing demands of the local situation. As with mill sites, in terms of these principles, such sites are all the same. But the differences in topography, distances to be covered, available building materials, and types of water sources, and so on, no two are the same.

SUMMARY

Adkins (1991:8-49) states that archaeological investigations of railroad resources can help us "understand the construction methods and maintenance requirements of railroads operating in Nevada's hostile environment." As a fairly well preserved example of early water works engineering and construction associated with the Southern Pacific, if not the original Central Pacific Railroad, this site embodies distinctive characteristics of a type, period and method of construction associated with an important moment in Nevada and American history, and can yield information important to an understanding of early water-technology, especially in the context of a hostile environment.

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Archaeology from Thin Air

David W. Valentine
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Early air mail flights were restricted to daylight hours due to the primitive nature of early airplanes and navigation equipment. The United States Postal Service realized that the only way to make airmail work was to fly planes around the clock. Borrowing technology from the Bureau of Light Houses, the Postal Service, and later the Department of Commerce, began constructing series of lighted beacons, known as airways, to guide pilots flying in the dark and inclement weather. The first transcontinental airway ran from San Francisco to New York City through northern Nevada in areas administered by the U.S. Bureau of Land Management, Winnemucca District. Changes in technology resulted in the abandonment of lighted airways, but information about these early navigation features is preserved in the archaeological record.

REDISCOVERY OF AIRWAYS

In 1993 the hazardous materials coordinator for the U.S. Bureau of Land Management, Winnemucca District Office, discovered an underground storage tank at a mining mill site in the Sonoma-Gerlach Resource Area (SGRA) in northwestern Nevada. Conversations with the mill operator indicated that the storage tank was associated with an abandoned landing field. A check of the Master Title Plats showed that the site was withdrawn in 1928 as an air navigation site, and that there were several other sites in the immediate vicinity.

It was determined that the air navigation sites were associated with the Department of Commerce as part of an airway. Airways were constructed to aid in the night flying of planes delivering mail and other cargo. Field investigations at air navigation sites identified several type of features associated with airways. The purpose of this paper is to describe the types of historic sites encountered along the airway identified in north-central Nevada.

HISTORIC BACKGROUND

After the Wright brothers' public demonstration of the viability of heavier than air craft in 1908 (Holmes 1981), not much thought was given in the United States to the potential economic development of the airplane. Many individuals thought the airplane was a toy for the adventurous, and money earned by pilots was from selling rides, demonstration flights given at county fairs, or early air races. These endeavors did little to demonstrate the potential of the airplane as a serious tool for the delivery of goods and services.

For several years airplanes were not

flown in Nevada, since it was believed that the thin air over the high deserts was not capable of providing sufficient lift. It was not until 1910, after some improvements in airplane design, that the first airplane was flown in a demonstration flight near Carson City (Earl 1979).

In spite of the general attitude towards the airplane as a machine for the thrill seeker, far sighted individuals in the United States Postal Service realized its potential. In 1911, the first airmail demonstration flights were given between Long Island and Mineola, New York. Many pieces of mail were successfully delivered. Prying funding out of a stingy Congress proved to be a different matter, and it wasn't until 1916 that money was appropriated for airmail contracts. Businesses were unwilling to sink money into buying aircraft for what was perceived as a risky venture, and the contracts were never let (Holmes 1981; Komons 1989; Leary 1985).

With United States involvement in the First World War, many Americans were exposed to the varied uses of aircraft. This added fuel to the Postal Service's arguments that airplanes were a viable mail delivery alternative. Involvement in the War also trained many pilots, and resulted in a glut of surplus aircraft after the end of the War. In 1918 Congress gave the Postal Service $100,000 to establish their own airmail route. This first route was established between New York City and Washington D.C., with a stop in Philadelphia. The army provided the pilots and planes for the first three months of operation. The route was not a financial success, but mail was delivered in a timely manner and it was thought to be an operational success. The Postal Service began planning for a transcontinental route between New York City and San Francisco (Holmes 1981; Leary 1985; Komons 1989).

The first leg of this route, between Cleveland and Chicago, was established in 1919. Later that year, it was expanded to New York. The route reached Nevada in 1920 with stops in Elko and Reno. By the end of the year it had reached Sacramento, California (Holmes 1981; Komons 1989; Leary 1985).

Early planes did not have much in the way of navigational gear. They were equipped with compasses, which often never stopped spinning, and altimeters, which were more useful as barometers than indicators of elevation. Radios were uncommon. There were no navigational charts, instead the post office provided Postal Service road maps. These maps did not show communities without post offices or potential hazards such as mountain peaks or church spires. The pilots were reduced to navigating by visible landmarks, which meant flying only in good weather. Because of this, airmail routes followed railroads (Holmes 1981; Komons 1989; Leary 1985).

Mail planes would fly until dark, land, and unload the mail on the first train heading in the same direction. A few sacks would be unloaded off a train the next morning, and flown on until dark. This leapfrogging of a minor amount of mail was more of a novelty than an actual benefit. The Postal Service quickly deduced that continuous movement of airmail was needed. To do so, flights needed to operate 24 hours a day, and would need ground based assistance to do so safely (Holmes 1981; Komons 1989; Leary 1985).

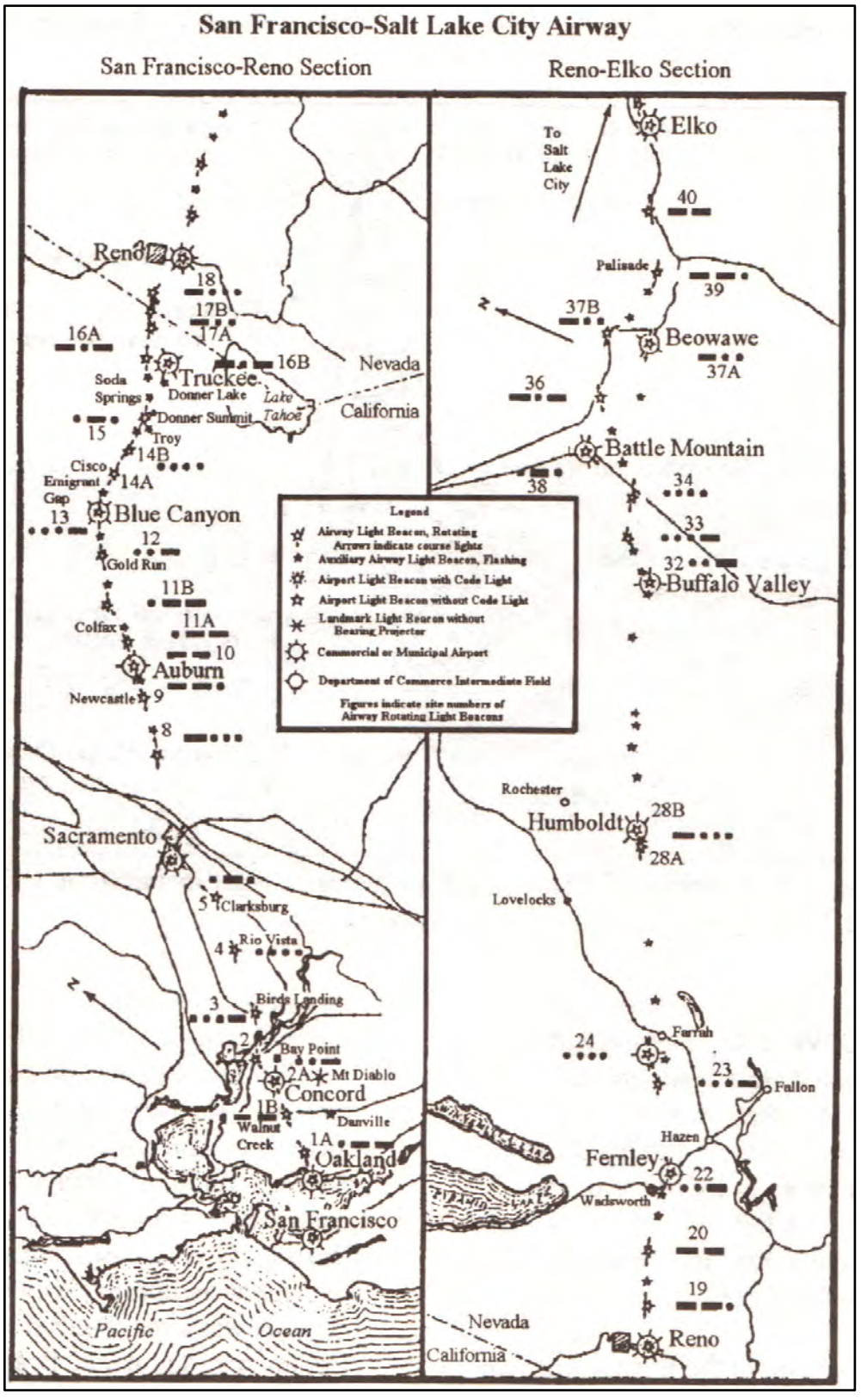

Figure 1. Map of the San Francisco-Salt Lake City Airway covering the Parran-Beowawe segment (USDC, AB 1932).

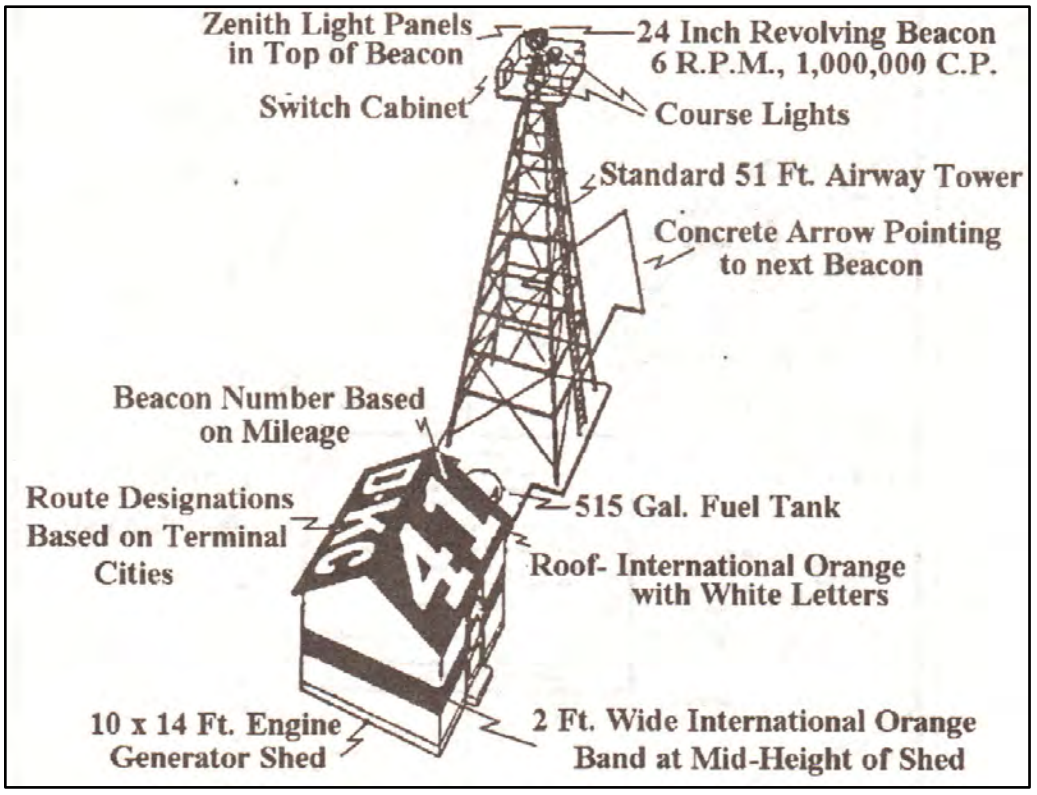

Figure 2. Diagram of a typical rotating beacon light installation (USDC, AB 1932: Figure 13).

Figure 3. Overview of concrete arrow foundation.

The army had some experience with night flying. During World War I they had marked runways with bonfires for night landings. Using this idea, the army then established an airway with lighted beacons, flashing markers and flood lighted runways that allowed for night flying. The Postal Service experimented with this military technology, and decided it was suitable for their needs (Holmes 1981; Komons 1989; Leary 1985).

In 1924 the first section of the transcontinental air mail route between Chicago, Illinois and Cheyenne, Wyoming was lighted. Later in the year, lighting was expanded to Cleveland, Ohio and Rock Springs, Wyoming. In 1925 the section between Cleveland and New York City was lighted. The year 1925 also saw the passage of the Air Mail Act, which required the Postal Service to contract flights instead of using their own planes and pilots (Holmes 1981; Komons 1989; Leary 1985).

In 1926 the Air Commerce Act was passed. This act gave the Secretary of Commerce the responsibility for fostering air commerce by issuing and enforcing air traffic rules, licensing and certification of pilots and planes, and establishing airways. The Department of Commerce took over airway construction and maintenance from the Postal Service. Initially, airways were maintained and constructed under the Airways Division of the Bureau of Lighthouses, since people from this division were familiar with beacon technology. The division was later changed to the Department of Commerce, Aeronautic Branch and later the Bureau of Air Commerce.

In 1938 the Civil Aeronautics Authority was created. In 1940, the Civil Aeronautics Board (CAB) and the Civil Aeronautics Administration (CAA) were created from the Civil Aeronautics Authority. The CAA had the responsibility for creation and maintenance of airways and airports, while the CAB created rules and regulations. The Federal Aviation Agency was created in 1958 as an independent agency, and took over the duties of both the CAA and CAB. In 1967 the Department of Transportation was created and the Federal Aviation Agency was reorganized within the Department of Transportation as the Federal Aviation Administration (United States Department of Transportation, Federal Aviation Administration 1991).

The Department of Commerce began expanding the airway system and lighting all of the routes. They also determined that following the railroad, and hence the Humboldt River through northern Nevada, added an extra 120 miles to the transcontinental route. A cutoff between Beowawe and Parran was established and lighted during the winter of 1928-1929 (Komons 1989).

ARCHAEOLOGICAL INVESTIGATIONS

The Beowawe-Parran cutoff route was the focus of the fieldwork for this paper. Twenty-three (23) sites along the Beowawe-Parran route were identified in the SGRA from master title plats and old United States Geological Survey maps. Thirteen of these sites were visited. Ideal Department of Commerce standards required placement of an electrified rotating beacon every 10 to 15 miles. At

first, the beacon was a 24 inch, rotating two lamp searchlight using 110 volt, 1,000 watt lamps that generated 1,000,000 candlepower (Young et al. 1931). Later, this was upgraded to a 36 inch, rotating, 110 volt, 1,000 watt incandescent lamp generating 1 million candlepower (United States Department of Commerce, Aeronautics Branch [USDC, AB] 1932).

One lamp was clear, while one was green if there was a landing field, or red if there was no landing field. Rotation was such to show six clear flashes per minute. Colored lamps were aimed in such a manner to flash a code identifying the beacon. Lamps were aimed 2½ degrees above the horizon. These rotating lamps were placed on steel skeletal towers, 20 to 87 feet high, with a standard height of 51 feet. Also on the towers were two course lights, consisting of red or green 500 watt searchlight projectors. Towers were placed in the center of a concrete directional arrow pointing towards the next beacon. A power house/storage shed was built at the end of the arrow, with the beacon designation painted on top (USDC, AB 1932; Young et al. 1931). At first, towers were painted alternating chrome yellow and black. This was later changed to international orange and black (USDC, AB 1932) and more recently to red and white.

In Nevada, these beacons were placed at points of easy access where commercial electrical power was available. These types of beacons were identified at three locations. All of the towers have been decommissioned and dismantled. Only the concrete arrow foundations, or fragments of them, remain. Artifacts commonly found at these sites include: burned out 1,000 and 500 watt bulbs, beacon glass, and paint brushes and cans. Two of these sites are located at, or near, landing fields.

In more inaccessible areas, or as a supplement to rotating beacons in mountainous terrain, Acetylene Flashing Beacons were used. Acetylene Flashing Beacons, or Blinkers, had two fixed clear lamps, 20 to 22 inches in diameter that flashed 20 times per minute (Young et al. 1931). The lamps were placed on 20 to 22 feet high skeletal steel towers. The towers were placed on wooden beam foundations with anchor bolts. The bottom of the tower was enclosed with sheet metal to form a shed for housing acetylene tanks. The acetylene tanks required refilling every six months. Painting schemes are the same as those for the larger electric beacons.

Much of the Parran-Beowawe cutoff is remote and mountainous, so it is no surprise that nine of the locations visited were blinker sites. All of the blinker sites have been decommissioned, and most of the blinker towers have been removed. At least one of the towers was reused to construct a windmill on a nearby ranch, but most appear to have been salvaged for scrap iron – a process that claimed a tower as late as 1991.

Two blinker towers are still standing in remote areas in the study area. Much of the acetylene delivery system has been removed from the towers, and in one case the lamp glass has been shot out, but both towers are in good shape. Where the towers have been removed, a leveled area is often found. Occasionally wooden beam foundations, or their remains, are present. Very few artifacts are found at these sites – anchor bolts; nuts, bolts, angle iron and sheet metal from the

Figure 4. Standing blinking beacon.

Figure 5. Typical site where a blinker beacon has been removed.

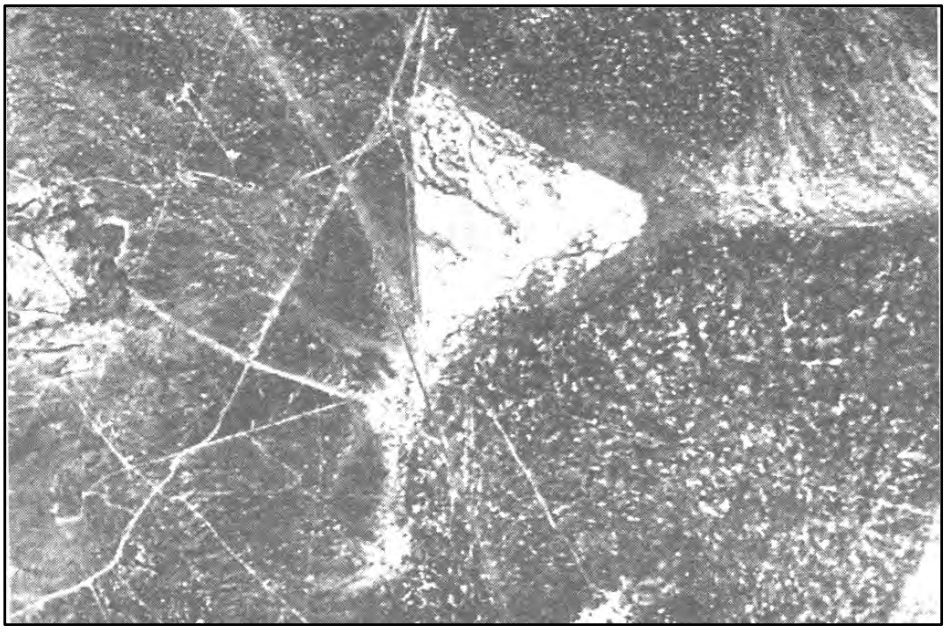

Figure 6. Aerial view of an intermediate landing field.

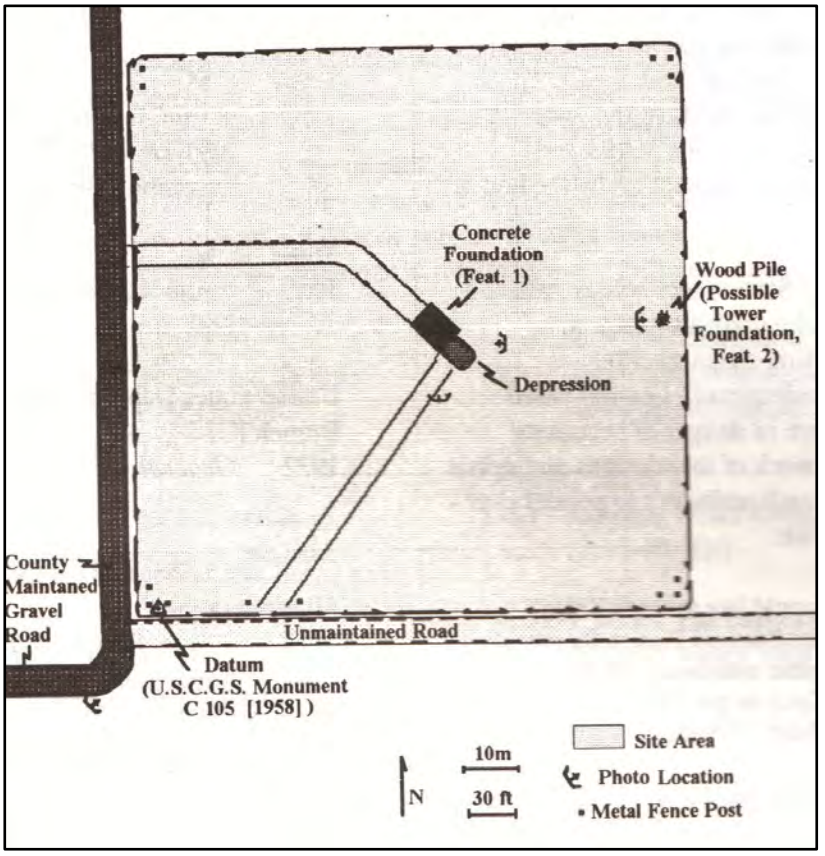

Figure 7. Sketch map of the Lovelock Radio Range Site.

tower and shed; and lamp cover glass.

Due to the unreliability of the early planes, auxiliary landing fields were constructed every 30 to 50 miles along an airway. T, L, or X shaped landing strips were built. The strips were 2,500 ft. to 3,000 ft. long. Intersections of the strips were marked with 50 ft. diameter white circles with 20 ft. colored panels running out into the runway. Strip boundaries were marked with 60 ft. orange markers at the corners and every, 600 ft. along the boundary. Boundaries were also illuminated with globe lights every 300 ft. around the field perimeter, or in remote areas with acetylene blinkers at field corners and centers of the sides (Jackson 1970; Young et al. 1931).

Two auxiliary landing fields are in the SGRA. Both of these fields were abandoned by 1950, as were most fields in the United States. The landing fields are difficult to spot from the ground, but the general outline shows up on air photos. One landing field is shaped like a large coffin, approximately 4,400 feet long by 1,900 feet at the widest point. The second landing field is an equilateral triangle with rounded corners, roughly 3,100 feet on a side. No indication of the runway configuration remains at these sites. Both locations have can dumps and other evidence of camp sites and/or temporary quarters. The trash dates back to 1928-1929, when the Parran-Beowawe cutoff was constructed, on up into the 1940s. Both sites also have wells and fuel storage tanks. Even though lighted beacons were useful for night flying, they were not especially useful in rain, snow or fog. The Department of Commerce was charged with developing directional radio facilities to guide aircraft in poor weather (Komons 1989).

The United States Signal Corps had developed the Four Course Range or Radio Range in 1923 based on the German Telefunken radio compass. A radio range:

> "...consists of a tone-modulating transmitter working alternately into two crossed vertical loop antennas displaced by 90 degrees. The radio frequency field pattern radiated from each loop is a figure-8 pattern. The intersection of the two figure 8 patterns produces four zones of equal field intensities of courses approximately 3 degrees wide. The letter A (· -) is transmitted by one loop, and the reciprocal letter N (- ·) is transmitted by the other loop. These letters are interlocked so that continuous dash is received when along the radial of equal field intensities. On either side of the course, the N or A signal will predominate over the background signal, indicating to the pilot which side of the course he is on (Jackson 1970)."

The Department of Commerce began installing radio ranges on the New York to Cleveland Route in 1928, and had installed radio ranges on all the major airways over the next five years (Komons 1978). In 1935, a fifth tower was installed on radio ranges to broadcast weather information (Jackson 1970). In the late 1930's, the ranges began to use Very High Frequency (VHF) radio signals and were known as VARs. VARs,

because of the overlapping figure 8 patterns, allowed pilots to navigate from a fixed point while not on an airway (Jackson 1970, Stuart 1943).

One radio range was identified on the Winnemucca District. This facility, known as the Lovelock Radio Range, was decommissioned by 1966 (Master Title Plat file Nev-051771). The site consists of a square cleared and leveled area, 293 feet on a side. The corners of the site are marked by tower anchor bolts. A two room concrete foundation is near the center. A light scatter of electronic debris and beacon glass covers the site. A bulldozed wooden beam foundation indicates that a blinker beacon operated at this location before construction of the radio range.

A supplement to the radio range is the homing beacon, also known as a homer, nondirectional beacon or H facility. A homer is an antenna emitting a continuous carrier, low to medium frequency radio wave in an omnidirectional pattern. The first was commissioned in 1924. In 1965 there were 439 homers in use on the nation's airways, but a program for decommissioning was already in place.

One homing beacon site was identified near McKinney Pass. Remains include a concrete foundation with tower anchor bolts, a second foundation with raised mounts and two trash dumps. One of the dumps contains air and oil filters, antifreeze cans, and motor gaskets. This indicates that electrical power for the facility was provided by a diesel generator. A depression near one of the foundations may be the site of an underground fuel storage tank. This power source also made it possible to change the nearby Pleasant Valley beacon over from a blinker beacon to a rotating beacon; however, no concrete arrow foundation was constructed for the upgrade.

Starting in 1947, new technology began to replace the VARs. A device known as the VHF Omnidirectional Radio Range (VOR) was developed, and radar stations began to play an ever increasing role in air navigation (Jackson 1970). These facilities are placed far apart and pilots are no longer restricted to narrow, lighted airways to be able to navigate from one point to the other. While VORs are located in the Winnemucca District, none are on the older Parran-Beowawe airway segment.

CONCLUSION

From 1924 up into the 1940s, lighted airways played a very important role in aviation in the United States. They made it possible to transport airmail, and later freight and passengers, in a safe and timely manner through the dark of night and in adverse weather conditions.

Continuously improving and expanding technologies decreased the reliance on airways. As the importance of the lighted beacon and early radio beacons began to wane, the Department of Commerce and successor agencies began a program of decommissioning beacons.

The maximum number of lighted beacons (2,274) in operation was in 1941. After that year the number kept in operation began to decline (Jackson 1970: Table 1). While rotating beacons are still used to mark airports, the last airway beacon was decommissioned in 1973 (Cheskaty 1973). By 1950 all of the intermediate fields in the lower 48

States were abandoned. All of the VARs and Homing Beacons were out of operation by the end of the 1960s.

Global Positioning System technology, where a location on, or above, the earth's surface is triangulated from orbiting space satellites, is becoming ever more widespread. Ground based navigational systems are in danger of becoming obsolete, leaving a network of foundations and debris for present and future archaeologists to ponder over – archaeology from thin air.

ACKNOWLEDGMENTS

I would like to thank Robert Lawson and *FAA* historian Edmund Preston for providing reference materials and other assistance. BLM archaeologist Peggy McGuckian provided encouragement and greatly appreciated field assistance.

(ORIGINAL) EDITOR'S NOTE

The author informed me as this was going to press that the remaining lamp on the airway blinker beacon at Jerzey Wash had been removed by someone who had taken great effort to get a vehicle to the location.

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The Nevada Rock Art Documentation Project

Alanah Woody, Eva Jensen, Jack and Elaine Holmes, and Anne McConnell
Originally published in *Nevada Archaeologist* 19 (2001)

Nevada's rock art is under increasing threat from urban sprawl and increased site visitation. Most rock art sites are undocumented and most professional archaeologists are unable to undertake this daunting task due to lack of funds and personnel. An educated public may be the best hope for documentation and preservation of rock art and other archaeological sites in the future. The Nevada Rock Art Documentation Project aims to document rock art sites throughout the state of Nevada by combining the efforts of both professional and avocational archaeologists.

INTRODUCTION

Rock art has been of little archaeological interest for many years simply because it couldn't be dated or "read" (Whitley and Loendorf 1994). With some notable exceptions, rock art was the province of avocational archaeologists. In some ways, this attitude contributed to rock art's marginalization as a professional domain of study. For years, dedicated non-professionals recorded rock art sites, funded only with their own money. These individuals attempted to understand rock art's place in prehistoric life, devoting vacations and weekends to their research. Problems with dating and interpretation remain, but in general, rock art research is now becoming the focus of professional archaeologists. One point we wish to make is that in spite of the growing professional interest in rock art dedicated avocationals can still make important contributions.

Working in conjunction with scientists, their efforts benefit both land managers and professionals. Land managers gain valuable information necessary for management and planning decisions. Avocationals also add to the data professionals use to develop and test hypotheses and theories.

Nevada has more than 1,000 known rock art sites (Woody 2000), but of that number little more than half can be plotted even to Township and Range. Fewer still have accurate Universal Transverse Mercator (UTM) coordinates. Even fewer include adequate records regarding type of rock art, motifs or associated archaeological materials. This information could aid in our understanding of the behaviors associated with rock art's use and production. The number of rock art sites recorded to today's high standards can be counted on only a few hands. The few adequately and accurately documented sites serve for future rock art recording efforts.

Concerned citizens often provide the impetus for professional recording. For example, the Harry Reid Center for Environmental Studies thoroughly recorded and mapped the Sloan Canyon site. "The Friends

of Sloan Petroglyphs," who brought attention to the problems of increased site visitation and urban development, played a key role initiating this action. Additionally, plans exist for professional recording of a small number of sites on lands administered by the Bureau of Land Management (BLM) in near future. The excellent work carried out by research institutions, contract firms, and land managing agencies in documenting sites on public and private lands should be applauded. It is very encouraging to those of us who feel that rock art deserves special attention and protection.

Nevertheless, the fact remains that most rock art sites will never be recorded, even marginally. Countless others will be vandalized or weather away without notice. So many other critical cultural resources are under threat, that there simply is not the time or funding available for professional archaeologists to do it all. Rock art is of course a priority to land managers, but the reality of the federal and state budgets often makes one or two individuals responsible for managing tens of thousands of acres. Choices must be made and in many cases, the immediate threat to other resources takes precedence. As professional recognition of rock art's importance grows, grant writing and fund raising for recording projects becomes essential. It is sometimes difficult to convince employers/professionals of the need for these projects since rock art sites comprise just one component of the archaeological record. With so many competing priorities, archaeologists can only devote a small portion of their time to rock art resources. A deep commitment to preserving rock art leads many archaeologists to volunteer their professional expertise during vacations and weekends for recording projects.

WORKSHOP

These problems seem almost insurmountable with land managers and professional archaeologists simply unable to devote the time and resources to rock art – so many sites and so little time or money. For the last several years a small group of people, both professional and avocational have been commiserating about this very problem. Most are long term members of rock art research organizations. They love rock art for both its beauty and its potential to answer questions regarding prehistoric human behavior. Tired of standing by and watching with a feeling of helplessness, these like-minded individuals decided to take action. Driven by a desire to help land managers and contribute to our understanding of rock art, they created The Nevada Rock Art Documentation Project. The need for more and better documentation of rock art is clear, and there is a large pool of avocational people who are willing to do the work. We organized a workshop to identify those who, like us, were tired of sitting on the sidelines and wanted to contribute. The invitation-only workshop was targeted to professionals and avocationalists with an interest in rock art that might be willing to provide either organizational expertise or training.

The successful workshop attracted 40 participants including, professional land managers, archaeologists and avocational rock art researchers. Held at the Old Logandale Historic School, the Lost City Museum

hosted the workshop. The Museum also provided a venue for meals and socializing, and gave workshop participants a chance to view artifacts from sites in the area.

Workshop presentations covered a variety of subjects necessary for starting a successful recording program. Dave Valentine, at that time working for the Bureau of Reclamation, discussed how rock art sites might qualify for protection under Federal regulations including Section 106 of the National Historic Preservation Act. Diana Hawks of the BLM in Arizona, sent information about a successful rock art project using Sierra Club volunteers. Helen Mortensen discussed the Site Steward program under consideration by the Nevada State Legislature. This bill supports public archaeology "watch" activities, advocates training and promotes participation by concerned citizens. Robert Mark discussed high tech methods to enhance photographic images of rock art motifs that may have faded in the field or on older photographs. Terri Robertson gave a presentation about her work to save the Sloan Canyon area. She is a perfect example of what an individual passionate about a cause can accomplish with hard work and persistence. Don Christensen provided the final presentation. An avocational, he recorded rock art for many years. His insight into successful partnerships with land managers was a valuable contribution to the workshop.

An important part of the workshop was an open discussion that allowed participants to voice concerns and exchange ideas. Many of these were incorporated into the procedures of the Nevada Rock Art Documentation Project. Everyone agreed that land managers do not have the time to train volunteers. Many have had bad experiences with volunteers who did not deliver the paperwork or who were more trouble than they were worth! Because documentation is crucial, land managers must receive original site records for deposition in the appropriate repository. It is also important that a duplicate copy of the records be stored at an alternative location. The Lost City Museum agreed to serve as the recipient of duplicate records for rock art sites in the southern part of Nevada.

Prior to the workshop, organizers created a list of endangered sites. Some have been recorded while some are already for professional recording. The participants reviewed all the sites on the original list, however one site warranted special attention. Within a few miles of a proposed community development on private land, the Wildcat Wash site looked like a good candidate for the first group project. The site's original documentation provided very limited information about the rock art and archaeology. The small size of Wildcat Wash was also advantageous in the first effort to train volunteers to record rock art and recognize archaeological features and artifacts. Sites not chosen will be reserved for future efforts as the group refines their approach. Additional input will be sought from the land managers throughout the state for further projects.

RECORDING

The recording project was a great success. Volunteers came from southern Nevada and California spending two full days drawing,

photographing and measuring distances between panels. Good things do indeed come in small packages. Wildcat Wash, chosen partly for the small size and "manageability", provided some wonderful surprises for volunteers and the professional archaeologists alike. The first day started with a bang when a small, incised stone was found (Figure 1). That was the first but not the last of the artifacts documented.

To streamline recording efforts we divided into several task groups. One group began numbering rock art panels, while other volunteers climbed to the tops of the canyon walls to scout for high panels and artifacts or sites. One team recorded vegetation at each panel and throughout the surrounding area. Experienced volunteers taught others to draw the numbered panels using a string grid to insure accuracy. The mapping team took GPS readings for panels and artifacts as well as measuring distances between each panel. Most of the rock art imagery was non-representational (Figure 2), but there were some motifs that may have been anthropomorphs (Figure 3). Others have been images of horned snakes or "serpents" (Figure 4). The field crew also identified three rock shelters. One shelter contained Puebloan and Paiute pottery along with a dark midden deposit. Two corncobs were noted in other shallow shelter areas. Exploring teams found one site high above the canyon floor consisting of several courses of stacked stone, interpreted as a hunting blind. Two locations in the canyon contained six deadfall trap sticks. At one location a bundle of cordage was found with five of the sticks, while the remaining stick was found in the other location. The volunteers identified only a few lithic artifacts and ground stone pieces scattered throughout the canyon.

At the end of the second day, 68 panels had been drawn and photographed, and 22 artifacts located and photographed. The "small" canyon revealed a wealth of information about past behaviors. Many individuals had come to the canyon and one tired crew left with a feeling of great accomplishment. More projects are currently in the planning stages and the Nevada Rock Art Documentation is off to a great start.

CONCLUSION

Since the Wildcat Wash recording project was completed, the Nevada Rock Art Documentation Project has been merged with the newly formed Nevada Rock Art Foundation. The goals and objectives remain the same, but the Foundation is a tax-exempt organization which allows donations made to be tax deductible. The Foundation's Board of Directors and Advisory Board include both professional anthropologists and archaeologists, but also concerned citizens who want to make a difference. Future plans include, in addition to rock art recording projects, a statewide educational program for kids and adults, publications, and continuing advocacy for archaeological site protection.

We wish to make it clear that we do not in any way condone large numbers of people invading rock art sites or support the open disclosure of sensitive site locations to each and every citizen who demands it. What we are advocating is thorough training for volunteers by professional archaeologists.

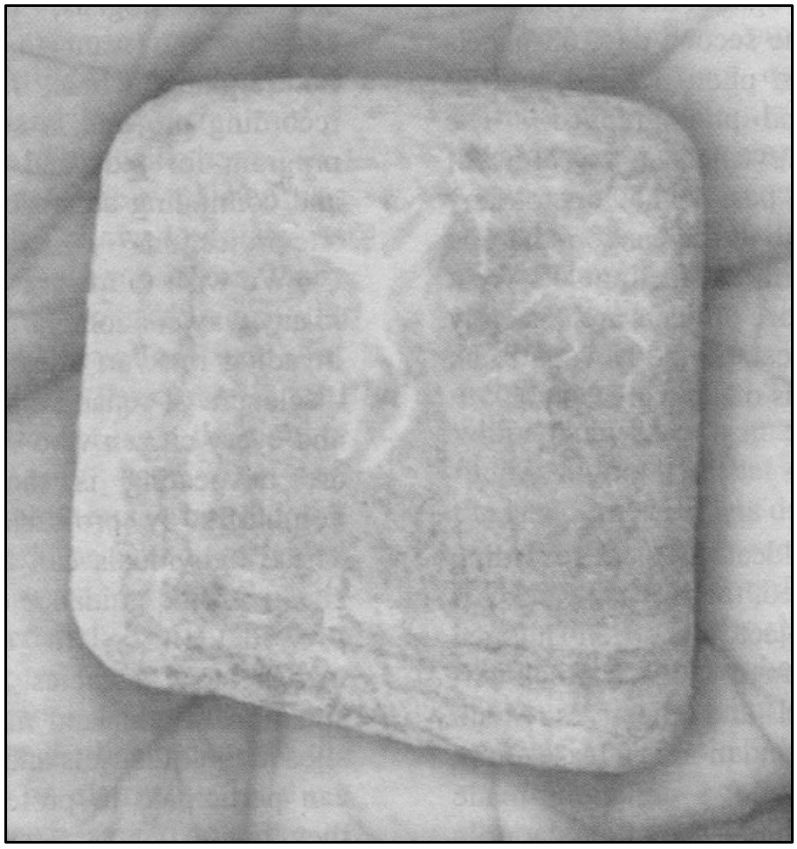

Figure 1. Small incised stone.

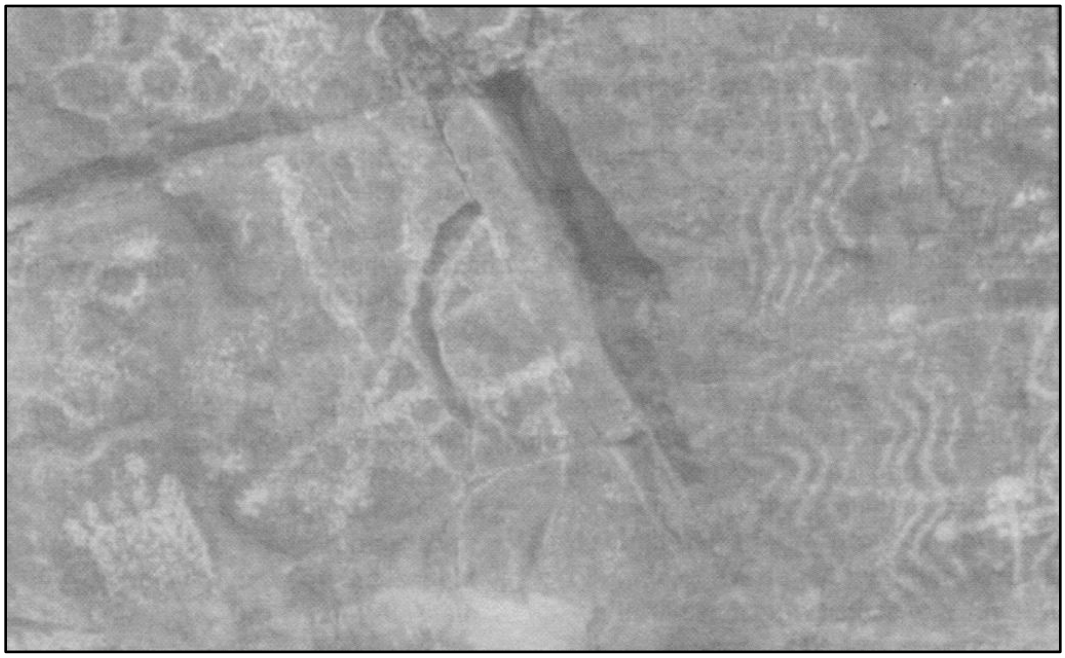

Figure 2. Non-representational motifs.

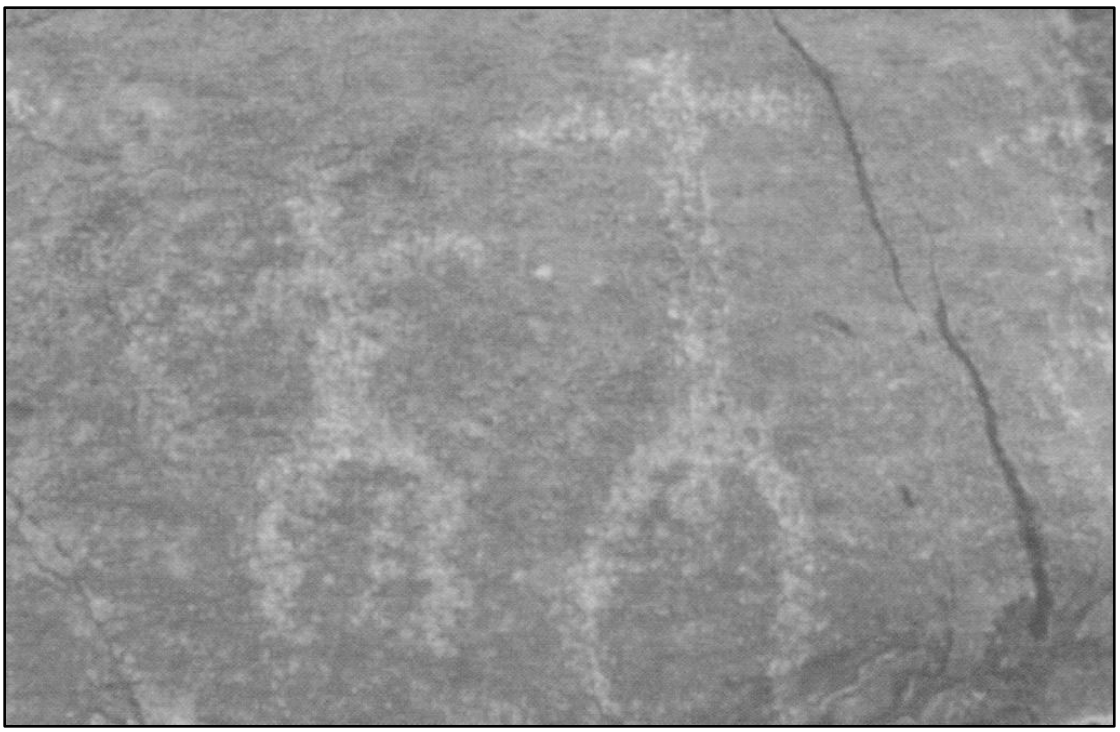

Figure 3. Anthropomorphic motifs.

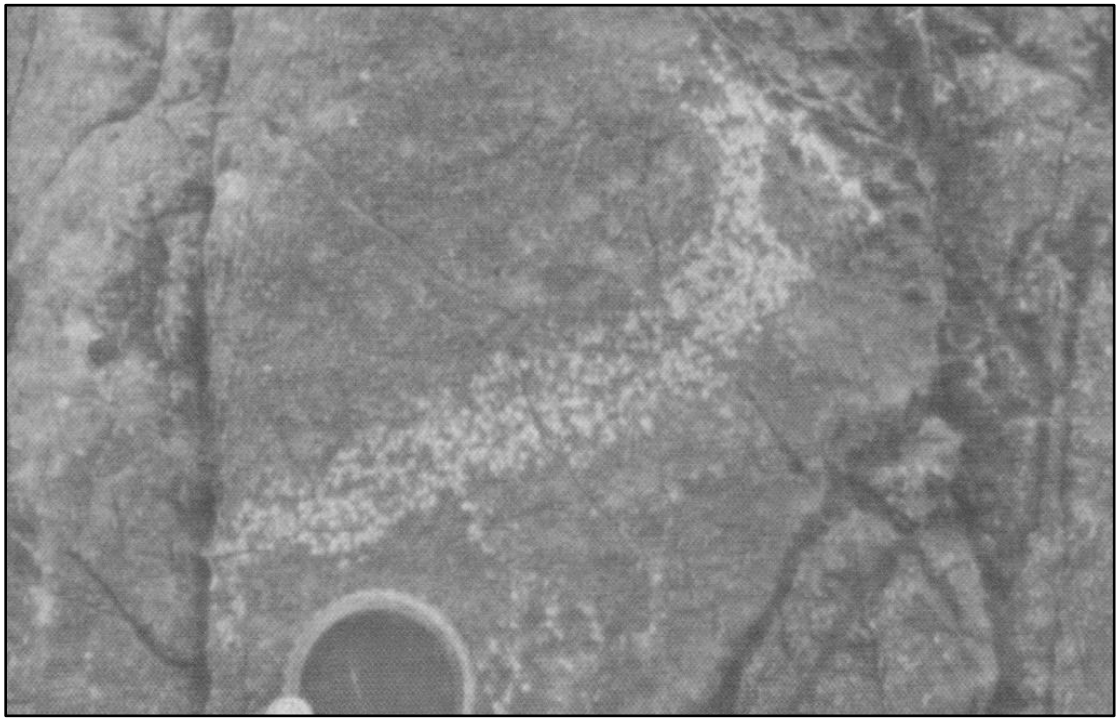

Figure 4. Horned serpent.

These individuals can then record rock art sites with the guidance of professionals and provide those to appropriate land management agencies. This is a win-win situation, where land managers get data on sites in their districts and rock art enthusiasts can participate in protecting the sites that they love.

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A Pebble Mound/Railroad Ballast Harvesting Site Near Hazen, Churchill County, Nevada

Steven Stearns and Alvin R. McLane
Originally published in *Nevada Archaeologist* 22 (2007)

A pebble mound site (26CH2335) recorded in March 2005, northeast of Hazen, Nevada has shed some light on the function of one of these enigmatic sites. The spacing of the rock rows of cobbles, raked pebble piles (some of which have been wholly or partially removed), and an approximately 100-year-old shovel blade found associated with one of the pebble mounds make a case for ballast harvesting during the 1901-1903 construction of the Hazen branch of the Southern Pacific Railroad (Myrick 1962). This is not a new proposal of their function but provides further credence to earlier proposals for the function of pebble mounds in this area.

Pebble mounds which include boulder/cobble cairns features along old beach terraces have been recorded in the vicinity of Hazen, Nevada. The Peg Wheat and Sadmat sites (26Ch190 and 26Ch163, respectively) are two better-known sites containing these mound features, but others have also been identified in Nevada and in the southern California desert such as in Silver Lake and Death Valley (Taylor et al. 1985; Wlodarski and Mcintyre 1979). Typically, these "pebble mound complexes" can be described as a series of patterned low-lying semi-circular mounds. "Pebbles" comprise rounded to subangular gravel averaging 2 to 7 cm in size. Sometimes, small rock cairns (comprising large cobbles and small boulders) as well as linear cobble rows or alignments are also found on these sites. Site size ranges from under an acre to near 100 acres with hundreds of pebble mounds present. Generally, these pebble mound/cobble cairn sites have the following characteristics:

- Associated with Pluvial lake terraces/beach features with some dissected by an erosional drainage feature – elevations in the Lahontan Basin are ca. 4,000 ft above sea level.
- Abundant gravel, cobbles, and boulders are associated with these terraces.
- Pebble mounds are circular to oval piles of well-sorted gravel ranging in diameter from ca. 1 to 1.5 m and generally they are less than 30 cm high.
- Cobble piles ("cairns") and linear, circular, and curvilinear cobble patterns found on these sites are similar to some geoglyphs. On many sites pebble mound spacing is symmetrical.
- Patinated artifacts and projectile points assigned to the Western Pluvial Lakes Tradition (12,000 to 8,000 years B.P.) are sometimes associated with these features (most pebble mounds features,

however, are absent of prehistoric artifacts).

- Few historic items are found on these sites.
- An historical railroad is usually found within a few miles or less in these areas.

Estimated age of the pebble mounds by archaeologists vary from historic times to over 8,000+ years. The historic date has been speculated by their presence near railroads or historic artifacts associated with these sites (see below). Prehistoric dating has been suggested by stemmed points and similar rock features found on Western Pluvial Lake Tradition and Archaic period sites (Irwin-Williams et al. 1986).

PEBBLE MOUND FUNCTION

Initially, pebble mound/cairns were first noted during studies in the desert areas of California and were later found in Nevada (Tuohy 1981). In California, rock mounds or cairns are associated with shallow burials, food caches, mining, erosional features, and trial-side shrines (Laylander 1996; Taylor et al. 1985:2-4). One of the earliest accounts of these features was by Rogers (1939) during his early man (San Dieguito) studies (similar rock piles were later found in southern Nevada at Tule Springs [Susia 1964]). In northern Nevada pebble mounds were first recorded along the ancient Lake Lahontan shoreline that also contained artifacts associated with Western Pluvial Lakes Tradition. As a result they, too, were thought to be prehistoric.

Studies by the Desert Research Institute (DRI) by Irwin-Williams et al. (1986) focused on techniques of gathering rainwater runoff using constructed pebble mounds near the Hazen area (their mock site is in the vicinity of26Ch163 and 26Ch190). In their view, the raked pebble mounds enhanced water runoff that in turn could be collected or diverted to important subsistence plant species. They also draw from the analogous pebble mound features found in the Israeli Negev Desert where they are used to successfully water a variety of crops. The Negev area also receives rainfall amounts similar to northern Nevada. DRI's experimental use of pebble mounds as water harvesting devices proved successful-pebble mounds significantly increased water runoff. However, the possible advantage of constructing pebble mounds on either the Sadmat or Peg Wheat sites for water gathering is questionable due to the accessibility of perennial water from the nearby Truckee or Carson rivers.

An historic link between the pebble mounds and the railroad was proposed by Tuohy (1981) and Dansie (1981). Touhy (1981:8) in his reference to the Sadmat site states:

> "...I should like to make it clear that not only are pebble mounds present there, but many of them appear to be mere remnants of mounds, the pebbles having been scooped up by unknown parties for unknown uses."

He (Tuohy 1981:8) also inserts his take on the function of the pebble mounds at the Sadmat site:

> "...I am of the opinion that some of the pebble mounds eventually will be shown to be of historic age, and related to the gathering of gravel for use in railroad grade or highway construction or repair work."

Dansie (1981:21) also saw a possibility for an historic connection:

> "most of these sites are located from one to three miles from the railroad. ...what look like typical mound complexes from the air, but which on the ground show that mounds seem to have been removed... Some of these are located near railroad grades."

She also suggests the possibility of pebble mounds having been used for the nearby emigrant wagon road improvements. However, she discounts their use for this purpose because of the intensive labor required to rake the rock piles and construct or improve this trail because of the overall physical condition of the emigrants at this point of their journey (having just crossed the exhausting Forty Mile Desert).

A railroad pebble mound connection has been in existence for a few decades, but convincing archaeological evidence for railroad construction or maintenance activities have not been presented. Recently, an intensive examination of site 26Ch2335 has furthered evidence for ballast harvesting in connection to the nearby Hazen line. The site and description of its features and historical connection follows.

SITE 26CH2335

Site 26Ch2335 was first identified on private land in conjunction with the development of a Nevada Department of Transportation (NDOT) material pit. Upon its discovery it was initially labeled as a geoglyph. This was based on multiple circular rock patterns 3 to 5 min diameter and linear alignments of several meters (Figures 1, 2, and 3). At first, remnant pebble piles were difficult to see on this site. This was in part due to juxtaposition of the cobble patterns (Figure 2) that dominated the landscape. In fact, these pebble piles were revealed only after a second visit to the site. Because it was first identified as a geoglyph, Alvin McLane, a Nevada rock art and geoglyph specialist, was asked to visit the site and provide his assessment of this feature. At this time, he also concurred with its identification as a geoglyph; however, he was puzzled by its complexity and size (it measured ca. 300 m x 100 m along a Lahontan beach terrace). This led him to return a few days later and, with the aid of Steve Glotfelty, they intensively studied these geometric features and expanded the survey area following this terrace to the northeast and southwest[1]. As a result, the site's boundaries enlarged as they located a total of seven areas containing rock alignments. The expansion of this site, over two miles to the southwest of the NDOT project, incorporates the Sadmat Site[2]. They found linear, raked rows of harvested pebbles several hundred feet long (Figure 4) and many remnant pebble mounds located adjacent to them. Also, at one of these remnant mounds is a ca. 100-year-old shovel blade (Figure 5). It was evident that the classification of this

site as a geoglyph was wrong. Instead site function focused on the historical harvesting of pebbles for ballast during the construction of the Southern Pacific/Hazen line railroad (Myrick 1962) located less than one-half mile away.

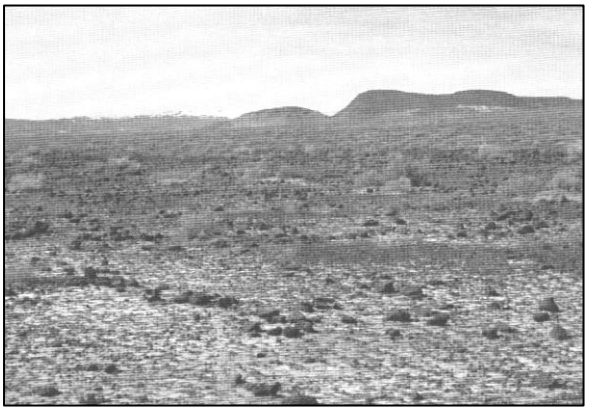

Figure 1. Pattern cobbles and boulders associated with remnant pebble mounts.

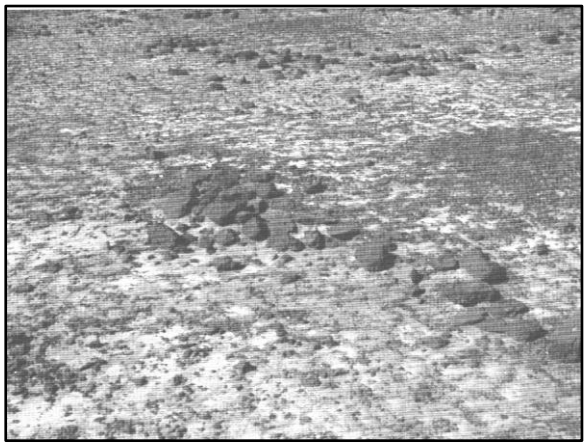

Figure 2. Remnant pebble mound with juxtaposed linear cobble feature.

Figure 3. Cairns/cobble piles on the perimeter of remnant pebble mounds.

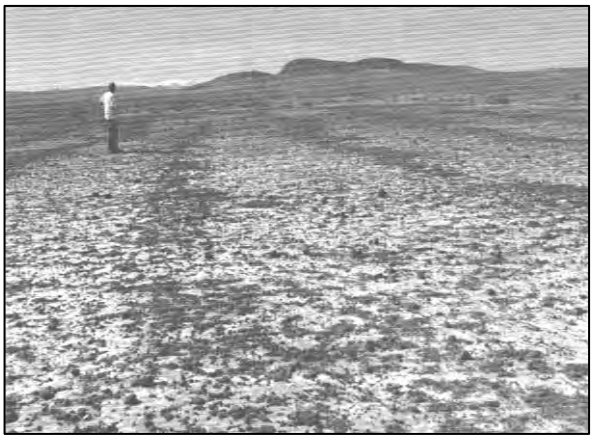

Figure 4. Raked gravel "windrows."

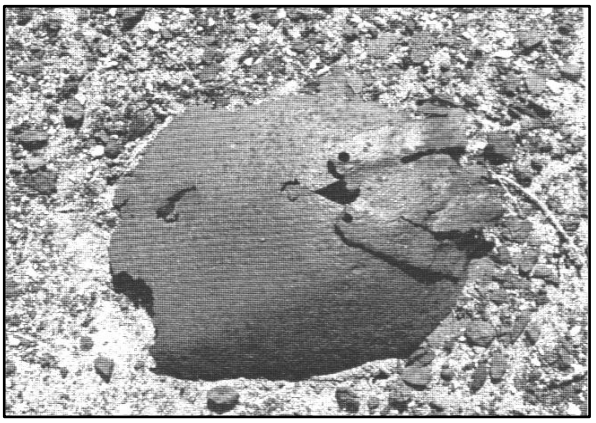

Figure 5. Shovel blade in remnant pebble mound in the vicinity of the Sadmat site.

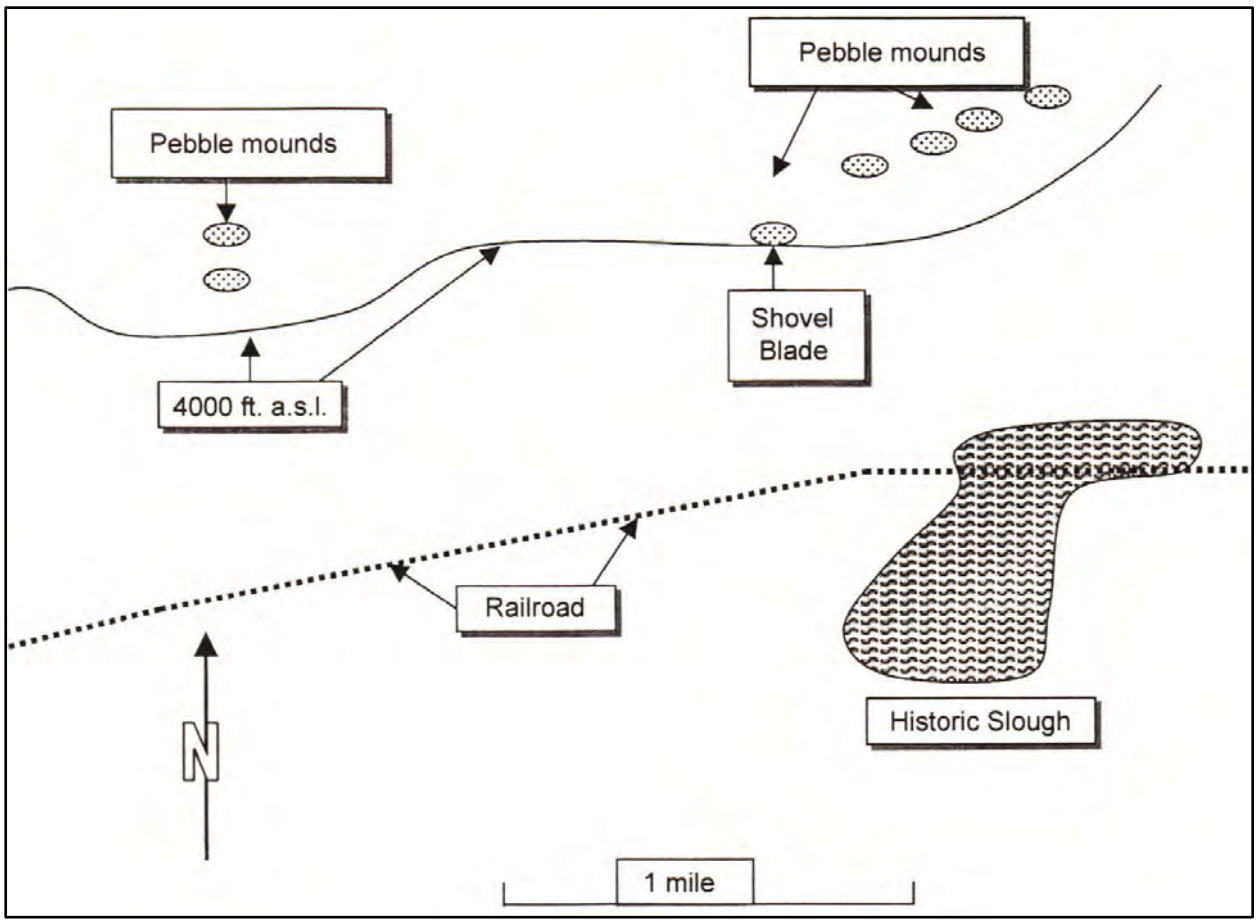

Figure 6. Some pebble mound locations near Hazen.

The argument for the function of 26Ch2335 as a ballast-harvesting site is compelling based on the surface features recorded during this survey. Site features described by McLane include:

- Seven harvesting areas located – some several hundred feet long along an approximate 2.50-mile linear area (Figure 6).
- A number of the rocks had the patina side down with the lighter, unpatinated surface facing up.
- In the center of cleared areas (showing the under silt/hard pan), with the rocks moved to the side (sometimes in circular patterns, linear arrangements, and rock mounds), were small pebble clusters[3] (see Figures 1-3).
- Circular cleared patterns were observed which were just wide enough to conveniently rake the pebbles into piles and spaced in a linear pattern wide enough to drive a wagon through. Then the pebbles could be loaded in from both sides (Figure 7).
- An occasional mound of raked up rocks located somewhat off to the side of the linear pattern were not removed and one can see the circular raked pat-

tern with the cobbles squarely in the middle.

- In one of the harvested areas, rocks have been raked into rows (Figure 4).
- The western locality showed a number of rock piles that were not removed, but there are also some piles that were harvested.

Figure 7. Proposed ballast collection method.

By itself, the geometric patterning, especially the long very regularly spaced parallel narrow rows, are indicative of an historical origin. The methods of raking these "windrows" of pebbles and cobbles indicate an expedient method for gathering ballast material. The following steps might explain the progression of ballast harvesting:

- Small railroad construction crews with hand tools including rakes, pitchforks and shovels were sent out along a beach terrace containing suitable rock material. This could be done by only a handful of people.
- Crews worked quickly raking pebbles into piles and removing cobbles and small boulders probably in just one or two passes thereby clearing a pathway for a wagon.
- Material could be shoveled into a wagon from both sides (Figure 7) and transported to a staging area or directly to the railroad bed. A shovel blade left adjacent to a pebble mound provides evidence of this (Figure 5).

CONCLUSION

The amount of material (cubic yards) yielded from these pebble mounds is unknown. However, the proposed process is simple enough and because this site can be developed expeditiously with only a handful of workers and a few wagons, this method could deliver part of the ballast needs in the construction of the Hazen line. These ballast-harvesting sites may have only been occupied for only a few hours or perhaps only a day. Because of the simplistic technology proposed here, and the few people participating in these activities, one would not expect a great deal of archaeological evidence left behind. The site formation process ac-

counts for the linear symmetry of the mound spacing that is quite evident from aerial views of many pebble mound sites. As a result of the field studies at 26Ch2335 it seems in order that other pebble mound sites should be reexamined for similar evidence for railroad ballast harvesting.

ACKNOWLEDGMENTS

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NOTES

[1] McLane suggests that these piles were left when the larger rocks in the mound were removed, probably by pitchforks, with the smaller rocks falling through the tangs.

[2] Studies of all of the known gravel mound complexes in northern Nevada may continue by Maggie Brown, archivist at the Nevada State Museum, and avocational archaeologist Oyvind Frock.

[3] According to the Sadmat site form, this site is plotted near the expanded boundaries of 26Ch2335 (in the southwest part of this site) but Sadmat does not correspond to all of the GPS locations given by McLane and Glotfelty.

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   and

3. Papers must adhere to the Society for American Archaeology's (SAA) Style Guide, downloadable at www.saa.org/ publications/StyleGuide/styFrame.html.

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