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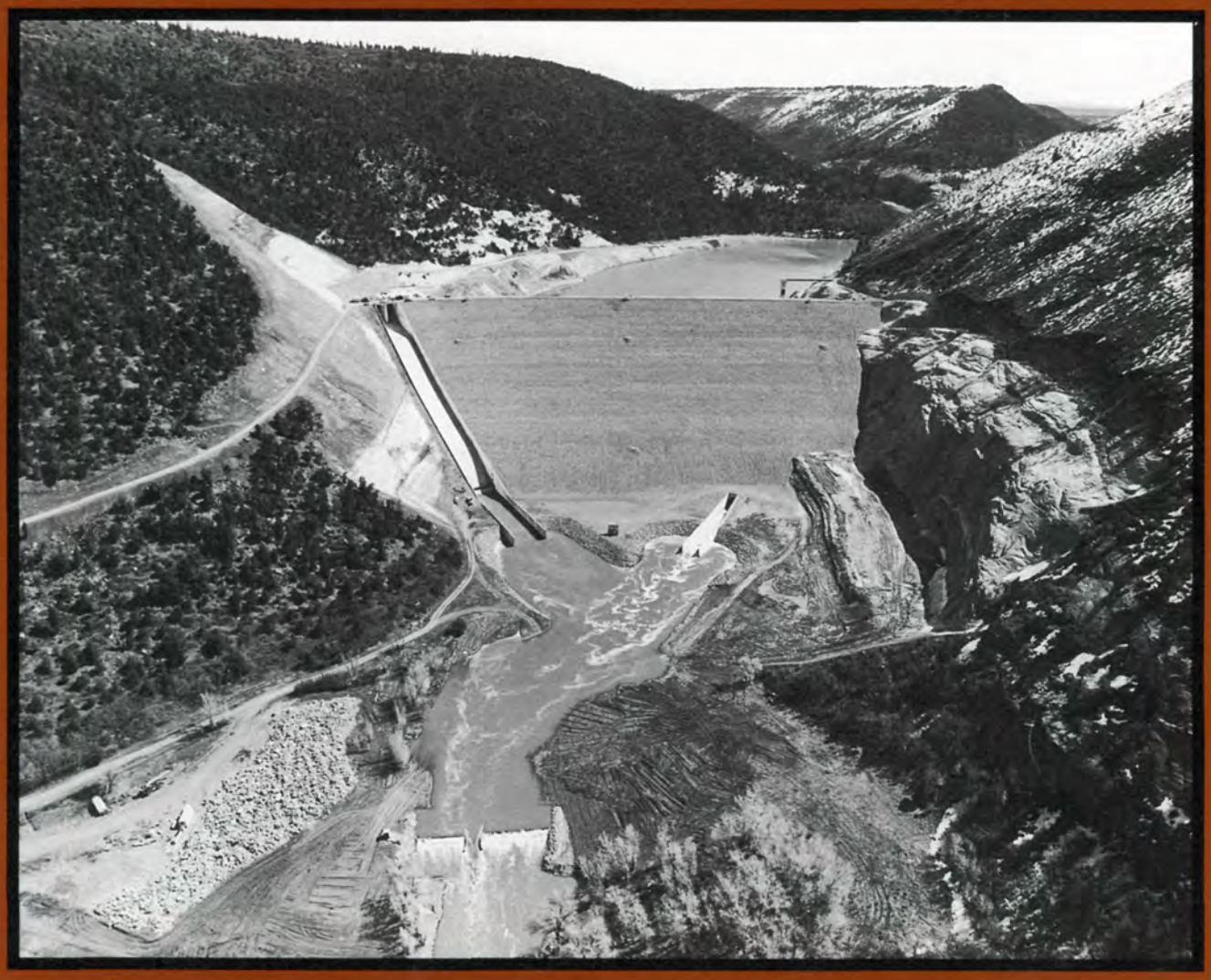
Dam Good Archeology



The Bureau of Reclamation's Cultural Resources Program

U.S. DEPARTMENT OF THE INTERIOR
National Park Service
Cultural Resources

PUBLISHED BY THE NATIONAL PARK SERVICE

Information for parks, federal agencies, Indian tribes, states, local governments, and the private sector that promotes and maintains high standards for preserving and managing cultural resources

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Cover: Filling the McPhee Reservoir. This upstream view shows the completed dam with the reservoir rising behind it. Many archeological sites were mitigated prior to the filling and construction of the reservoir. Photo courtesy J. Fleetman, Bureau of Reclamation.

 Send articles and correspondence to the Editor, *CRM*, U.S. Department of the Interior, National Park Service, 1849 C Street, NW, Suite 350NC, Washington, DC 20240 (U.S. Postal Service) or 800 North Capitol St, NW, Suite 350, Washington, DC 20002 (Federal Express); ph. 202-343-3411, fax 202-343-5260; email: <crmmag@nps.gov>, to subscribe and to make inquiries; <rongnps@starpower.net> to submit articles.

Myra J. Giesen and Jon S. Czaplicki

Over Fifty Years of Dam Good Archeology

An Introduction to the Bureau of Reclamation's Cultural Resources Program

The articles in this issue of *CRM* are based on papers originally presented at the 63rd Annual Meeting of the Society for American Archaeology held in Seattle, Washington in 1998. They were part of the symposium, "Over Fifty Years of Dam Good Archaeology," organized to highlight the U.S. Bureau of Reclamation's (Reclamation) cultural resource program. Our intent was to have all 11 papers and the discussant's comments presented at the meeting published together; however, not all the authors were able to submit final versions of their papers to *CRM*. Expanded versions of all papers, including the two unpublished papers, are available on Reclamation's web site <http://www.usbr.gov/cultural/>. These papers now serve as the framework for planning an exhibit to highlight Reclamation's centennial celebration in 2002.

Reclamation is best known for the dams, reservoirs, powerplants, and canals it constructed in the 17 western states over the past nine decades, as it attempted to accomplish its mandate to reclaim the arid west. These early construction projects were not accomplished without impacts to cultural resources. As you will see in the following papers, the results of these projects have contributed significantly to American archeology in method, theory, and data. Today, although its mission has changed to water management and conservation, Reclamation continues to advance progressive solutions to cultural resource issues through involvement in public outreach programs and proactive strategies for handling such issues as Indian trust assets, the Native American Graves Protection and Repatriation Act (NAGPRA), and collection accountability.

This issue begins with an overview by Wm. Joe Simonds of Reclamation history and its early involvement in cultural resource management. Robert Blasing's discussion of history of federal archeology on Medicine Creek provides information on Reclamation's archeological involvement in the Medicine Creek Valley of Frontier County in south-central Nebraska. This Missouri River Basin project began in 1947 to identify and excavate the many prehistoric occupations that would be inundated by the planned construction of Medicine Creek Dam.

The next paper by Lynn S. Teague looks at the results of the Salt-Gila Aqueduct (SGA) Project that continue to aid in the understanding of the prehistoric Hohokam occupation in central Arizona. SGA was one of three major projects that preceded construction of the 335-mile Central Arizona Project aqueduct that today brings Colorado River water to Phoenix and Tucson.

Next, in "Postwar Partners in Archeology: The Bureau of Reclamation, the National Park Service, and the River Basin Surveys in the Missouri River Basin (1945-1969)," Lynn M. Snyder, Deborah Hull-Walski, Thomas D. Thiessen, and Myra J. Giesen address the partnerships established as part of the River Basin Surveys project. They also discuss some of the major contributions to the profession resulting from "salvage" projects conducted on Reclamation lands.

Moving back to the Southwest, William D. Lipe's "A View from the Lake: The Dolores Archeological Program in the McPhee Reservoir Area, SW Colorado" looks at five of the major contributions to American archeology of the Dolores Archeological Program (McPhee Reservoir area, 1978-85). In "A Retrospective on the Four Corners Archeological Program,"

Warren F.X. Hurley continues a discussion of the Dolores Project, emphasizing the data recovery conducted since the conclusion of mitigation for McPhee Reservoir. Hurley explores how the Dolores Project has redefined the archeology of the northern Southwest.

The changing emphasis in American archeology and cultural resource management is highlighted in papers by G. James West; Kimball M. Banks, Myra J. Giesen, and Nancy E. Pearson; and Thomas R. Lincoln. West discusses how public interpretation of a major archeological project was developed in "New Melones: Public Interpretation of the Archeological-Historical Record." In "Traditional Cultural Properties vs. Traditional Cultural Resource Management," Banks, *et al.*, provide a philosophical approach to understanding what is a cultural resource. They direct their paper to archeologists involved in cultural resource management with emphasis on the impact of recent federal actions on archeologists and Native Americans, and on Indian trust assets. This paper points to the diverse topics now facing federal cultural resource managers. Lincoln's "Off the Back Roads and onto the Superhighway: Reclamation Reports" looks at how archeological data are reported and how changes in technology are changing the way archeologists report their work.

Finally, Francis P. McManamon and Fred Wendorf, two archeologists intimately familiar with the federal archeology program and each with a unique perspective on it, provide concluding comments and insights on the papers. Their synthesis places the papers into a broader national context, yet speaks to the individual importance of each contribution.

"Reservoirs of Resources: Bureau of Reclamation Salvage Archaeology from 1975 to 1985 in Texas, Oklahoma, and New Mexico—The Palmetto Bend, Choke Canyon, McGee Creek, and Brantley Projects" by Van Button and Bobbie Ferguson and "The Glen Canyon Project" by Alexander J. Lindsay, Jr. are the two papers missing from the original symposium. Button and Ferguson reviewed Palmetto Bend, Choke Canyon, McGee Creek, and Brantley projects and tracked publications from each project. They provide some hypotheses on why important data from these projects remain relatively unknown and unused today. Lindsay discusses the multi-disciplinary studies undertaken in the mid-1960s for the Glen Canyon Project in northern Arizona.

We hope this collection of papers is informative and interesting for individuals unaware of what Reclamation is or what it has done or is doing with respect to cultural resource management. It was our goal, in organizing the symposium and, then, generating this collection of papers, to stimulate further discussion on these topics. Visit Reclamation's CRM web site and read more about our cultural resource program. We would like your feedback, questions, or comments about these papers or about Reclamation's cultural resource program. At our web site, click on "feedback" and share your thoughts; we would like to incorporate ideas on our cultural resources program accomplishments into Reclamation's 2002 centennial celebration.

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Jon S. Czaplicki is an archeologist with the Bureau of Reclamation, Phoenix Area Office, Phoenix, Arizona, and co-guest editor of this issue of CRM.

SAA Symposium Papers on the Web

The papers presented in this issue of *CRM* are shortened versions of the papers presented at the 1998 SAA Symposium "Over Fifty Years of Dam Good Archaeology." Readers interested in the full text versions of the papers, as well as information about Reclamation's Cultural Resources Program, are encouraged to visit Reclamation's web site <http://www.usbr.gov/cultural/>.

Wm. Joe Simonds

The Bureau of Reclamation and its Archeology

A Brief History

The Bureau of Reclamation is the nation's largest water wholesaler and second largest producer of hydroelectric energy in the United States. Today's agency is a far cry from the one created at the turn of the 20th century with the goal of "reclaiming" the arid lands of the West and providing homesteads for western settlement. The many changes that the agency has undergone in the past 90 years has assured that Reclamation will play an important role as the West enters the next millennium.

The Bureau of Reclamation was created in 1902 as the United States Reclamation Service, a division of the United States Geological Survey. Creation of the Reclamation Service was the culmination of a decades long effort to "reclaim" arid lands of the western United States through development of irrigated agriculture. In the years prior to passage of the Federal Reclamation Act of 1902, Congress passed several laws promoting settlement of the West through disposal of public lands and development of irrigation. These efforts proved to be unsatisfactory.

The barriers to western settlement were unlike those which faced the first settlers in the East. Throughout much of the eastern U.S., water was abundant and available year-round. But in the West, rivers which ran full and fast each spring often dwindled to near-nothing in the late summer and fall. Much of the region's precipitation came during winter months when it was of no use to irrigators. The solution to this problem was development of storage reservoirs and works to capture winter rains and spring floods for later release. The cost of developing such storage was high, and few private enterprises could afford such developments.

During the 1890s, demand for federal irrigation development in the West grew. Led by Nevada Representative Francis Newlands, publisher William Ellsworth Smythe, and National Irrigation Association head George Maxwell, the western irrigation movement gained momentum. In 1900, each major political party inserted pro-irrigation planks in their platforms, making it a national issue. The first bills introduced in Congress to establish a federal reclamation program failed. Seen primarily as a western issue, few eastern politicians showed much interest in western irrigation. But after western interests blocked a number of pet projects for eastern congressmen, western irrigation suddenly became interesting to eastern politicians.

The "reclamation" movement received a significant boost when Theodore Roosevelt became president in 1901. A strong supporter of western irrigation and a former resident of the arid western regions, Roosevelt had first-hand knowledge of the area's condition. Moving swiftly to establish a federal reclamation program in the West, Newlands re-introduced his reclamation bills. Armed with strong public support and the endorsement of the president, Newlands' bill quickly moved through Congress and was signed into law on June 17, 1902.

Terms of the Reclamation Act authorized the Secretary of the Interior to locate and construct irrigation works in 16 (later 17) western states and territories. Funds for construction of those project were to come from sale of public lands within those states and territories. The secretary was further authorized to close to settlement all lands that would be irrigable under the projects. Following completion of project facilities, these lands would be opened for settlement under provisions of various homestead laws and in tracts no larger than 160 acres to prevent speculation and encourage homesteading by individuals and families.

Soon after passage of the Reclamation Act, Secretary of the Interior Ethan Allen Hitchcock formed the Reclamation Service within the U.S. Geological Survey, appointing Frederick H.

Newell, chief of the Survey's Division of Hydrography, head of the new service. In forming the organization, Newell drew heavily from the ranks of his former division, appointing men who had previously been involved in western resource surveys.

Within a year after passage of the Reclamation Act, six projects were approved, and in August 1903, construction of the first project, the Truckee-Carson Project in Nevada, began. Over the next four years, 19 new projects were approved. In 1907, the Reclamation Service was given independent status as a bureau of the United States Department of the Interior.

The Reclamation Service soon established itself as a world leader in dam engineering and construction. In 1910, the Service completed Shoshone Dam near Cody, Wyoming. At 325 feet, it was the world's tallest dam. In 1915, Reclamation completed construction of Arrowrock Dam in Idaho, pushing the record to 350 feet. Throughout the late teens and twenties, Reclamation continued to hone its engineering skills, pioneering numerous advancements in dam design and construction. In 1932, the Bureau of Reclamation, so named in 1923, completed construction of Owyhee Dam in Oregon. Rising a record 417 feet, Owyhee Dam was the proving ground for methods and technologies developed for construction of Hoover Dam which would rise 725 feet above the Colorado River.

The construction of Hoover Dam marked the beginning of a new era in the federal reclamation program: the era of multi-purpose, water resource development with far-reaching benefits including irrigation, hydroelectric power, flood control, recreation, and fish and wildlife enhancement. Hydropower had long been a part of the Reclamation program. Generating plants on Reclamation projects provided power for pumping and other project-related uses with surplus power sold to farms and towns. While the potential for hydroelectric development at many Reclamation reservoirs was recognized, controversy over public vs. private power development hindered significant developments. Even so, by 1923, powerplants were operating on 12 Reclamation projects.

The passage of the Boulder Canyon Act in 1928, authorizing construction of Hoover Dam, placed Reclamation at the forefront of the hydroelectric industry in the west. The enormous generators turning deep inside Hoover's powerhouses would provide only one benefit—revenue. Revenues from the sale of electricity generated at Hoover Dam would be used to repay construction costs. Unlike previous Reclamation projects, water users did not pay for project development. Power had become the paying partner of irrigation, and federal irrigation and hydroelectric development became almost inseparable.

Construction of Hoover Dam was the beginning of large-scale, multi-purpose, water resource developments for the Bureau of Reclamation. Major projects undertaken at this time included the Colorado-Big Thompson Project and the Central Valley Project. Following on the heels of Hoover Dam, the Columbia Basin Project, with Grand Coulee Dam at its focus, emerged from the arid regions of central Washington State. Like Hoover, Grand Coulee was centered around its hydropower potential. While controversy over public vs. private power development continued, others questioned the wisdom of building the world's largest powerplants in a region relatively devoid of people and industry. Some of the power generated at Grand Coulee would be used to pump water to project lands, but markets for surplus power seemed nowhere to be found. Few could have anticipated the surge in demand for power caused by the outbreak of World War II.

When the United States entered World War II, the national industrial complex geared up to provide materials and supplies for the war effort. The western United States, with a ready supply of cheap electrical power, was one of the major beneficiaries of the industrial build-up. Throughout the war, generators at Hoover, Grand Coulee, and numerous other Reclamation power facilities, operated full-time providing power for war related industries. In addition, Reclamation facilities supplied water to grow food for domestic and overseas use. Power and water supplied by western Reclamation projects played a significant role in securing an Allied victory.

As World War II drew to a close, Reclamation officials and planners turned their attention toward the future. Following the end of World War I, returning veterans rushed to claim newly opened farm units on Reclamation projects, and Bureau officials believed the same would be true following World War II. In addition, thousands of veterans would return to a booming economy in need of employment. With this in mind, Reclamation planners readied pro-

jects for construction and prepared project lands for settlement.

A significant step in preparing for the post-war period was reorganization of the Bureau. In 1943, Reclamation announced the formation of six regions headquartered in Boise, Sacramento, Billings, Salt Lake City, Boulder City, and Amarillo. A seventh region, headquartered in Denver, was added later. The regional directors had broad administrative authority to deal with the daily operation of projects within their regional borders while maintaining close relationships with local water users. Responsibility for the technical aspect of project design and construction remained with the Chief Engineer's office in Denver while overall responsibility for Reclamation's operation came from the Commissioner's office in Washington, DC.

In the post-war era, Reclamation's construction program grew, fueled by the Pick-Sloan Missouri Basin Program—a joint program of Reclamation and the Corps of Engineers for the comprehensive development of the Missouri River Basin. The Missouri Basin Program was the largest water resource development ever envisioned and included the full spectrum of multipurpose benefits. The Pick-Sloan Plan called for construction of more than 300 project units including over 100 dams providing 107 million acre-feet of storage, 2.6 million kilowatts of electricity, and water to irrigate more than 4,000,000 acres of land. Other benefits included navigational improvements, flood control, recreational developments, and water for municipal and industrial uses.

Between 1945 and 1960, Reclamation began construction of more than 60 projects. In addition to the Pick-Sloan Program, Reclamation initiated construction on additional units of the Central Valley Project. In the Colorado River Basin, the first units of the Colorado River Storage Project began to take shape.

By 1960, numerous forces began pressuring Reclamation, eventually resulting in a fundamental shift in Reclamation's program and mission. Budgetary cutbacks, the shift in the western economy away from agriculture, and the rise of the environmental movement, were all factors contributing to the change. Despite these forces, Reclamation accomplished some of its most notable achievements during the 1960s. In 1964, Reclamation completed Glen Canyon Dam, the key feature of the Colorado River Storage Project. Second only to Hoover Dam as the nation's tallest concrete dam, Glen Canyon Dam looms more than 700 feet above the Colorado River standing as a monument to the struggle between western resource development and environmental protection.

The last major round of project authorizations took place in the late 1960s. The few projects authorized since then were generally extensions of existing projects or projects to improve water quality. Throughout the 1970s, the environmental movement continued to gain strength, resulting in strong opposition to western water development projects. The public's growing political awareness and the economic difficulties of the era also hindered further developments.

In the 1970s, two events took place that resulted in significant changes in the Reclamation program. In June 1976, Teton Dam, a 300-foot high earthfill dam in Idaho, failed. Although the only such occurrence in Reclamation's then 75 years of dam construction, the disaster called attention to the subject of dam safety and helped fuel opposition of water resource development projects. The second event was the release of President Jimmy Carter's "hit list" of several dozen large water projects, including several Reclamation projects, which Carter refused to fund. While Carter's list proved to be politically unpopular and many of the projects survived, it was one more manifestation of the growing opposition to large-scale water resource development projects.

The 1980s was a period of transition during which Reclamation slowly and painfully turned from being a water resource development agency to a water resource management agency with environmental protection, water conservation, and fish and wildlife enhancement given equal consideration with the needs of water users. Beginning in 1988, Reclamation began a major reorganization that significantly reduced both the budget and staff of the organization. The change was difficult, and even today a few voices of discontent can be heard in the halls of the Engineering and Research Center in Denver, renamed the Reclamation Service Center—a name that reflects the new mission of the Bureau of Reclamation:

To manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The changes at Reclamation were difficult, but Reclamation survived and will continue to play an important role in the American West of the 21st century.

Reclamation's involvement in archeology and Cultural Resources Management (CRM) began in the mid-1940s with participation in the River Basin Surveys Program. The establishment of the basin surveys was in response to the Pick-Sloan Missouri Basin Program. A group of prominent archeologists, concerned about potential destruction of archeological resources in the Missouri Basin, formed a committee to lobby for establishment of a federal salvage archeology program. The group sought and received support and sponsorship for the program from the Smithsonian Institution.

All of the agencies involved in development of the Missouri River Basin were aware of the potential threat to archeological sites, but only the National Park Service had any responsibility for protection of archeological data, and recovery of that data was outside the agency's mission. The Park Service agreed to conduct recreational surveys of reservoir sites in the Missouri River Basin, and assessment of archeological and historic resources was part of those surveys. In 1945, the Park Service and Smithsonian signed a memorandum of understanding whereby the Park Service would provide the Smithsonian with survey results. The Smithsonian would then analyze the reports and provide the Park Service with plans and budgets for any proposed work. Funds for salvage operations were provided by Reclamation and the Corps of Engineers, and work was carried out by the Smithsonian. The River Basin Surveys Program was headed by noted archeologist Frank H. H. Roberts. Although created in response to the pending development of the Missouri Basin, the River Basin Surveys Program conducted work in numerous river basins.

In 1960, Congress began passing legislation that would establish a legal obligation for agencies to develop CRM programs. The Reservoir Salvage Act of 1960 required any federal agencies involved in reservoir construction to notify the Secretary of the Interior of potential harm to archeological or historic sites. In 1974, the Archaeological and Historic Preservation Act extended those provisions to include all federal or federally-sponsored construction activities.

In 1966, Congress passed the National Historic Preservation Act (NHPA) which requires federal agencies to consider the effects of any federal undertakings on historic resources. In 1971, President Richard Nixon issued Executive Order 11593 calling for protection and enhancement of the cultural environment. In 1980, amendments to the NHPA codified sections of Executive Order 11593, and required inventories of cultural resources on federal lands. The amendments also required agencies to develop programs to protect historic and cultural resources under their control.

In 1974, the Bureau of Reclamation hired its first archeologist, Dr. Ward Weakley. As responsibility for protection of cultural resources under their control grew, so too did Reclamation's CRM staff. Soon, CRM personnel were employed in many of Reclamation's regional and area offices.

Today, Reclamation's archeologists and historians work to identify, evaluate, and preserve cultural resources located on lands administered by the agency. In addition Reclamation's CRM personnel play an important role in management of those lands by participating in development of land use plans. Reclamation CRM personnel work closely with state officials, other federal agencies, and tribal representatives to provide assistance and guidance in management of cultural properties. Recent passage of the Native American Graves Protection and Repatriation Act has increased Reclamation's responsibilities, and Reclamation CRM personnel are working closely with tribal representatives and federal officials to fulfill those responsibilities.

Reclamation's CRM program is also dedicated to the preservation of archeological and historic resources located throughout the West, not just on federally-administered lands. Reclamation CRM personnel actively participate in programs to promote public education and awareness of the importance that cultural resources play in understanding our past. Through their participation in public education programs, sponsorship of archeological and cultural resource activities, and their continuing efforts to protect and preserve the evidence of past human activities, Reclamation's CRM personnel have shown their dedication to the preservation of the past for the benefit of future generations.

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Robert Blasing

The History of Archeological Research at Medicine Creek Reservoir

Medicine Creek is a tributary which flows southeast into the Republican River, which in turn contributes to the Kansas River. The drainage basin is in southwest Nebraska and is about 75 km or 50 miles in length. It drains an area of slightly under 700 square miles.

Medicine Creek Reservoir (Reservoir) was completed in 1949. It was built primarily to control destructive flooding on both the Medicine and Republican drainages. It is also part of the Frenchman-Cambridge Irrigation Project, administered by the Bureau of Reclamation (Reclamation).

The area around the Reservoir is covered by a deep mantel of wind blown or water redeposited loess, which has enhanced the burial and preservation of archeological sites. The terraces of this deposit have themselves been the focus of scientific inquiry.[1,2] Where bedrock is exposed, it is the Cretaceous Niobrara Formation, which includes a major source of raw material for prehistoric stone tools. This material is usually called Niobrara, Smoky Hill or Republican River Jasper, and it occasionally occurs in numerous beds which may be several feet thick at a given exposure.

Excavation of house floor at Medicine Creek. River Basin Surveys photo.

In addition to the Niobrara Jasper, several other natural features made Medicine Creek a focal point for prehistoric populations. The creek is spring fed, and was a very reliable source of good quality water, even in periods of drought. The large deposits of clam shell in some archeological sites on the Reservoir attest to the availability of aquatic food sources. This corner of Nebraska is often referred to locally as the "Banana Belt" because the area consistently has the warmest winter temperatures in the state.

Another draw to the area is the Fort McPherson Trail which followed the divide between the Deer and Medicine Creek drainages and was a military trail in the historic period, but no doubt used in prehistoric times as well.[3]

The History of Archeological Research

Prior to the planning of Medicine Creek reservoir, several archeological sites had been recorded along the Medicine Creek Drainage, though not all were within the boundaries of the federal reservoir. These sites were identified by the early explorations by William Duncan Strong and A.T Hill[3] and Waldo Wedel in 1931.[4, 5] Paleontologist Erwin H. Barbour,[6, 7] also doing research in the area, identified two species of shovel tusked mammoths as well as other extinct species.

In August 1946, planning for the Reservoir was begun by Reclamation. Marvin Kivett and J. Mett Shippee spent eight days looking for archeological sites in the proposed Reservoir area. They found 14 Upper Republican sites and one Woodland site which encouraged a return for further excavation in 1947.[8] In the spring of 1947, a Nebraska State Historical Society (NSHS) crew led by A.T. Hill began excavations. In September, October, and early November, a River Basin Surveys crew led by Marvin Kivett continued the work.[9]

From the end of March through August 1948, both the RBS and the NSHS had crews

working at the Reservoir. These crews comprised as many as 15 to 20 men mostly provided by Reclamation. It was during this 1947-48 work that large-scale mechanical stripping of the sod was first used in the excavations; this also was done with Reclamation equipment. The 1946 to 1949 work by River Basin Surveys and NSHS focused on archeology from the Woodland and Upper Republican periods. In all, 21 sites were investigated with 49 houses and many other features excavated.

Somewhat overlapping the time of these excavations was a series of excavations by the University of Nebraska State Museum (UNSM).[10] This work focused exclusively on Paleo-Indian and paleontological sites in the Reservoir area, specifically Lime Creek (25FT41), Red Smoke (25FT42) and Allen (25FT50). This research took place from 1946 to 1952, under the leadership of C. Bertrand Schultz and W. D. Frankforter,[11] Preston Holder and Joyce Wike,[12] and E. Mott Davis.[13, 14] All work at the Reservoir from 1946 to 1952 was research directly related to construction of the Medicine Creek dam.

In the fall of 1967, additional research was undertaken at the Reservoir. A University of Missouri seminar class on central plains archeology, taught by W. Raymond Wood, excavated the Mowry Bluff Site, a single Upper Republican phase house. For comparison, a second house of the Nebraska Phase also was excavated along the Missouri River. The field work was completed in September with the analyses taking place during the following fall semester. A comparison of the information recovered from the two houses was detailed and interpreted in a "Memoir of the Plains Anthropologist" edited by Wood.[15]

In the 1970s and 1980s, the UNSM[16, 17, 18] and Anthropology Department, University of Nebraska, Lincoln (UNL)[19] continued to assist Reclamation by salvaging archeological and paleontological materials exposed by construction at the Reservoir. In the 1980s, Reclamation archeologists became concerned with shoreline erosion and began a series of small surveys in advance of construction projects around the Reservoir. At this time, 35 sites had been recorded on federal land at the Reservoir. Jeff and Suzanne (Bradley) Kenyon began working at the Reservoir,[20, 21] along with Donna Roper, then working for Gilbert Commonwealth under a contract with Reclamation, to identify and evaluate sites being destroyed by shoreline erosion. In 1987, the author and Brad Coutant, working for Reclamation, became involved in the archeology at Medicine Creek. That same year, during a six-week stay at the Reservoir, they discovered mammoth bone in an eroding high cut bank. Steve Holen and David May began salvage excavation and research on this mammoth site in 1988. The site is approximately 18,500 years old and contains bone flakes, impact points, and other patterns which seem to indicate human involvement. Holen has revisited this site regularly in the succeeding years to continue research and protect newly exposed material.[22, 23] In 1988, the author relocated to Grand Island Nebraska as the Nebraska-Kansas Area Archeologist, and began to visit the Reservoir regularly.[24, 25, 26]

The 1990s saw a more methodical attempt to fully inventory and evaluate all archeological sites around the Reservoir. A series of cooperative agreements between Reclamation and area universities were implemented to aid with this work. This began in 1990 with the UNL field school under the direction of Douglas Bamforth. Bamforth continues to re-evaluate collections from the 1940s and 1950s work of UNSM through his current position at the University of Colorado, Boulder. Additional field schools have followed, including several seasons of research by Don Blakeslee (Wichita State University) and Donna Roper (now with Kansas State University). Members of the Nebraska Archeological Society, a statewide amateur group, have donated time making some significant contributions to the various field projects. Virtually all federal lands at Medicine Creek have now been surveyed and more than 350 archeological sites have been recorded.

Archeology

Medicine Creek Reservoir is located in an area of low population density where federal land is scarce. Federal reservoirs are important to local archeological research in the area because they are the only large areas examined extensively. Because funding for excavation on private land is often difficult to procure, federal reservoirs also provide a large percentage of the excavated sites in the region.

The work done at Medicine Creek has contributed heavily to the definition of at least three cultural units. The work by the UNSM identified what was called the Frontier Complex. These are the only late Paleo-Indian sites found in the area.

Using ground penetrating radar to map buried prehistoric living surfaces. Photo by the author.

The Kieth Site and other Woodland material were excavated in 1947 and 1948 at the Reservoir. These provided much of the information used to define the Kieth Focus.[27] The wealth of research data recovered from the many houses excavated by the NSHS and River Basin Surveys in the late 1940s has provided much of the basis for defining the Upper Republican Phase, although this name had been used as a broad designation as early as 1933.[28] With sites like the 18,000-year-old La Sena mammoth, the potential for additional cultural units being defined at the Reservoir is promising.

Work at the Reservoir has spawned some very innovative methods. Probably foremost was the use of heavy power equipment in the 1940s to expose sites, necessitated by the rush to complete excavations before reservoir construction and flooding. It was discovered that the heavy equipment, which seemed so potentially destructive to underlying archeological deposits, actually allowed a much better understanding of the extent and relative locations of the features. It also revealed many additional features that would have been missed had the heavy equipment not been used. A much better understanding of relationships within a site was obtained when low altitude aerial photography was added to the investigation. While use of heavy equipment at first appeared to be an expedient trade off, it was soon revealed as both more efficient and more thorough than traditional methods. The method has since been used on large construction projects throughout the country.

Wood's use of a field project and seminar class[15] to provide both teaching and research opportunities also has been copied. The concept of having a number of students, each pursuing a separate study focus, at the same site that most of them had helped excavate, provided a wide range of perspectives and incentives for further research.

Contributions to at least two additional methodologies have been developed in the last decade. Holen had a micro vertebrate paleontologist on site to identify, trace, and excavate rodent burrows separately before excavating the archeological level. This method removes many of the site contamination concerns inherent with excavating a possible pre-Clovis level. At the Lime Creek and Red Smoke sites, Larry Conyers, working with Bamforth, has adapted a remote sensing method from geological studies to map deeply buried prehistoric living surfaces. This is done by lowering the receiver of a ground penetrating radar system into a series of two-inch core holes on the site.

Summary

In areas where there is little funding for archeological research, federal reservoirs can have a major influence on the archeological knowledge and development of new methods. Medicine Creek provides an excellent example because of the heavy concentration of archeological sites and the diversity of time periods represented. This combination has allowed the work at the reservoir to provide key information for defining cultural units and an opportunity for pioneering new methods. Most of these gains would not have been possible if not for funding from federal cultural resource protection laws.

In the fall of 1997, a celebration was held at the Reservoir to mark 50 years since the start of federal excavation in the area. More than 90 people attended this celebration, including researchers from the 1940s projects. It is hard to estimate how many researchers and students have worked at Medicine Creek Reservoir over the years, but it must surely be in the hundreds. The knowledge gained there has greatly influenced the direction of Plains archeology.

Notes

1 J.C. Brice, *Erosion and Deposition in the Loess-mantled Great Plains, Medicine Creek Drainage Basin, Nebraska*, U.S. Geological Survey Professional Paper 352-H (1966).

2 Gregory K. Elias, "The Sedimentation and Geologic History of Certain Terraces in Frontier County, Nebraska" (master's thesis, Department of Geology, University of Nebraska, Lincoln, 1949).

[3] William Duncan Strong, *An Introduction to Nebraska Archeology*, Smithsonian Miscellaneous Collections 93:10 (1935): 242.

[4] Waldo Wedel, "Preliminary notes on the Archeology of Medicine Valley in Southwestern Nebraska," *Nebraska History* 14:2 (1933): 144-165.

[5] Waldo Wedel, "Contributions to the Archeology of the Upper Republican Valley," *Nebraska History* 15:3 (1934):133-250.

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The Salt-Gila Aqueduct Project and Hohokam Archeology

The Salt-Gila Aqueduct Project began in 1980, one in a long series of archeological undertakings associated with the Bureau of Reclamation's Central Arizona Project. When it ended more than 4 years later, after investigations at 65 sites ranging from very small artifact scatters to a 60-acre village, Hohokam archeology was changed. The major studies that preceded SGA were relatively few: excavations at Los Muertos by the Hemenway Expedition in the 1880s (Haury 1945), at Snaketown in the 1930s (Gladwin, *et al.* 1937) and again in the 1960s (Haury 1976), at Painted Rocks Reservoir in the 1960s (Wasley and Johnson 1965), and the Escalante Ruin Group in the 1970s (Doyel 1974) were the most substantial. There were also a number of smaller and sometimes significant studies, but the avalanche of Hohokam data that we now experience was definitely in the future. Salt-Gila also represented the first substantial series of excavations focused on smaller villages and farmsteads rather than the largest settlements.

The size of SGA was a cause for concern on the part of the agency. Large CRM projects had a checkered history. Many considered it questionable whether these efforts could justify their substantial costs. SGA was budgeted at 69.6 person-years of effort at a cost of $1,671,309.51, exclusive of cost-sharing. This was clearly a project on a scale to provoke concern. Although I am not an unbiased observer, it seems to me that the project did fulfill its promise and justify its cost.

In 1980, the transition between the pre-Classic Hohokam and the subsequent Classic Period was not well understood, although there had been much speculation. The period between the demise of the Phoenix Basin platform mound system of community organization in about A.D. 1350 and the arrival of the Spanish in the Southwest in 1540 was even less known. SGA added significantly to our information regarding both of these periods. In addition, discussions of Hohokam prehistory had been marked by an assumption of regional uniformity; SGA made the great diversity of the Hohokam regional system apparent.

Environment and the Hohokam

It is important that SGA identified no environmental change that was by itself causal in major cultural change (Miksicek 1984). This was

Example of siphon on Salt-Gila Aqueduct. Photo courtesy L. Hobbs, Bureau of Reclamation.

a major research conclusion in itself, since reconstructions of Hohokam prehistory dominant at the time that the project began posited environmental causality for a variety of shifts in settlement, social organization, economy, and material culture (for example, Doyel 1980). SGA set out to test the suppositions underlying that reconstruction of prehistory (Teague 1982), and made a major contribution in documenting the extent to which the Hohokam had the knowledge and the technology to adapt to the non-catastrophic kinds of environmental variability that they encountered in the Sonoran Desert.

Another assumption that was common among Hohokam archeologists as the project began was that the early Classic Period was characterized by a severe economic decline, probably precipitated by environmental problems (Doyel 1980). It also had been proposed that there was a "collapse" of the Hohokam regional system, represented by the ballcourt complex and accompanying belief system (Wilcox and Sternberg 1983). SGA did not find evidence of the proposed economic decline (Teague and Crown 1984). In the early Classic Period the Hohokam in the study area experienced stable or increasing economic interaction with those elsewhere at the same time that there was increased differentiation from those areas in styles of material culture, architecture, and ritual expression.

Social Organization and Economy

A major focus of SGA research was the internal organization of Hohokam communities. The SGA project confirmed that the pre-Classic Hohokam were an essentially egalitarian people with little role specialization or difference in access to trade goods. There was high mobility, particularly during the pre-Classic periods, with many individuals and families spending portions of the year in fieldhouses, returning to villages during the remainder of their annual round. Those permanent villages might be on the rivers or on productive major washes like Queen Creek and Siphon Draw. However, participation in central community activities would have required association with a village having a ballcourt, and these were not present at Queen Creek. During the pre-Classic periods riverine and non-riverine settlements complemented one another as part of the flexible economic and social strategy of the Phoenix Basin Hohokam.

Shifts in the location of settlements at the time of the Sedentary-Classic Period transition had been documented for some time, beginning with the excavations at Los Muertos by the Hemenway Expedition in the 1880s (Haury 1945). Nonetheless, the process of change leading to this changed settlement structure had not been very thoroughly investigated. SGA provided an opportunity to excavate some of the smaller settlements on the rivers, documenting the persistence of Hohokam house-in-pit architecture into the Soho phase of the Classic Period (Shaw 1983). The evolution from houses in pits to the compound architecture of the Civano Phase was also traced on the Gila River near

The Central Arizona Project

In 1968, Congress authorized construction of the Central Arizona Project, or CAP, by the Bureau of Reclamation. The CAP consists of a 335-mile long aqueduct designed to carry 1.5 million acre-feet of water per year from the Colorado River to cities, farmlands, and Indian communities in central and southern Arizona.

Besides providing water, the CAP provided a unique opportunity to look into Arizona's past. As part of the project, the Bureau of Reclamation conducted one of the largest federal archaeology programs ever undertaken. Most of the CAP archeological investigations have focused on the remnants of a people archeologists call "Hohokam." Although they left no written records, archeologists have learned much about these people who lived from about 300 B.C. to about A.D. 1450 in the Salt and Gila river valleys near modern-day Phoenix.

CAP archeological studies have been performed by private groups, including universities, small businesses that specialize in archeological research, and most recently by a Native American tribal archeological program. Since the early 1970s over 5,500 archeological sites have been identified, and almost 600 of these have been excavated. The main stem of the CAP aqueduct is completed and carrying water; remaining to be completed are CAP systems on several Native American Indian communities.

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Florence (Sires 1983a). Prestige goods were concentrated more heavily in mound settlements than elsewhere in the Hohokam world (Teague 1984a), but everywhere there was evidence of continued participation in religious ritual by individuals throughout the society (Teague 1984b). By comparing data from the SGA sites with information from earlier excavations and from ethnographically documented cultural traditions of the Southwest, evidence was found suggesting that during the Classic Period the religious institutions of the Hohokam included interlocking ritual societies similar to those found ethnographically in the Southwest.

The Post-Classic

One of the significant results of SGA was the discovery that the El Polvorón site dated to the period after the decline of the platform mound system (Sires 1983b). The site gave its name to the Polvoron Phase in local prehistory and enabled project researchers to identify post-Classic occupations within multi-component sites that had been excavated earlier, at other sites on the lower Salt and middle Gila rivers (Crown and Sires 1984).

In Hindsight

Almost two decades after it began, we can ask how well Southwestern archeology assimilates the results of projects like SGA. Fortunately, Reclamation supported then, as it continues to support, efforts to get information out to the profession and to the general public. The SGA contract supported project researchers presenting both individual papers and project sessions at SAA and Pecos Conference meetings. Nine volumes of technical reports were published. A project-based program provided educational curriculum enrichment for schools in the Apache Junction and Florence, Arizona, areas.

This isn't always enough. Archeologists continue to rediscover the obsolescence of the core-periphery model of the Hohokam tradition, the residential mobility of the Hohokam people, or other conclusions reached 14 years ago by SGA researchers. Numerous citations of SGA in reports over the past 15 years testify to the continuing visibility of SGA in the Hohokam literature and to the importance that the project research has had for studies of the Hohokam.

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Reclamation's Museum Property

In addition to making contemporary contributions to the understanding of North American prehistory, Reclamation's 50 years of dam good archeological research* preserved a substantial collection of artifactual material that continues to be available for research and exhibit.

In 1990, the Department of the Interior Inspector General found that the Department, including Reclamation, was not in control of its art work and artifacts. Working under Departmental requirements for museum property that were put in place in 1993, Reclamation is well along in its commitment to reach accountability for all identifiable collections by the end of fiscal year 2003.

Although Reclamation's museum property includes items from a number of subject areas, e.g., the mission of the bureau, art, paleontology, and zoology, the vast majority is prehistoric objects.

At the end of October 1999, Reclamation had:

- verified museum property in 61 non-federal and 2 federal repositories and in 40 Reclamation offices;
- determined that the collections include 2,315,016 archeological objects/lots which have been catalogued into the repository's or a Reclamation system, and that an estimated 3,800,000 archeological objects/lots remain to be catalogued;
- found that associated with these objects/lots are more than 1,000,000 individual and 775 linear feet of documents; and
- expended more than $6,638,523 to locate, catalogue, and bring collections to acceptable standards.

For additional information on Reclamation's Museum Property Program, contact Bobbie Ferguson on 303-445-2707 or at <bferguson@do.usbr.gov>.

* Research conducted primarily under the River Basin Surveys program, the Reservoir Salvage Act/Archaeological and Historic Preservation Act, the National Historic Preservation Act, and the Archeological Resources Protection Act.

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Postwar Partners in Archeology

The Bureau of Reclamation, the National Park Service, and the River Basin Surveys in the Missouri River Basin (1945-1969)

The year 1945 saw American archeology facing a major crisis. The Japanese surrender in August marked the end of World War II, and it was the signal for the United States to begin its transition back to a peacetime status. As part of the transition, the Bureau of Reclamation and the Corps of Engineers moved to activate plans for the construction of a vast reservoir system throughout the country. Well before the war ended, it was obvious that the building of the dams and the filling of the reservoirs would result in an unparalleled destruction of archeological materials.

Donald J. Lehmer[1]

The Flood Control Act of December 22, 1944, authorized dam construction on a large scale throughout the nation. The objectives of this massive water control effort were flood control, improved navigation, power generation, conservation and enhancement of fish and wildlife habitat, creation of recreational opportunities, and potential irrigation water for over three million acres of previously unirrigated land. The downside of this incredibly ambitious public works program was that much of the nation's archeological heritage was threatened with destruction or inundation as a result of dam construction and reservoir operation. It has been estimated that at least 80% of archeological remains are located along the banks of rivers and creeks.[2] As a result, such massive water control efforts could substantially destroy the lion's share of the archeological record in the U.S.

Oahe Reservoir, Stanley County, South Dakota, 1950. Oahe Dam construction. Don Lehmer in foreground.

Bureaucracy and Planning

In May 1944, during the annual meeting of the Society for American Archaeology, a planning committee of concerned archeologists was formed to review the past results and problems of Works Progress Administration archeological work. Problems perceived by the committee included inadequate funding, lack of central direction, insufficient numbers of trained supervisory archeological personnel, publication lag, and the scattering and even loss of the resultant collections and data. Their report offered several important recommendations for future federally-sponsored archeological programs, including that:

- a "guiding force" should be established to provide central direction to the effort;

- the professional personnel engaged in such programs should not be burdened with administrative responsibilities, but rather should remain free to concentrate their attention on archeological matters;
- properly qualified organizations and personnel should be selected; and
- analysis and reporting of research should be completed for each project undertaken.

Based on this report, the Committee for the Recovery of Archaeological Remains was established in May 1945 and became the aforementioned "guiding force" recommended by the planning committee.[3]

The federal government's response to this call for action was the establishment of the Interagency Archeological and Paleontological Salvage Program, later shortened to the Interagency Archeological Salvage Program. Created in the late summer and early fall of 1945, the Interagency Archeological Salvage Program was a multi-agency, cooperative program designed to inventory and assess the importance of archeological resources in planned reservoir areas, and to preserve a portion of the archeological record in those reservoir areas by conducting excavations at selected sites.

Participating organizations were the Bureau of Reclamation (Reclamation) and the Corps of Engineers (Corps) as the nation's foremost dam-building agencies; the Smithsonian Institution as the scientific research arm of the federal government; the National Park Service (NPS) as the federal bureau with legislatively-mandated responsibility for surveying the nation's archeological and historical resources; and the Committee for the Recovery of Archaeological Remains as the principal advisory spokesgroup for the archeological profession. State and local universities, historical societies, and museums also participated as cooperating institutions, doing survey and excavation.

Garrison Reservoir, McLean County, North Dakota, 1952. Aerial view of the Night Walker's Butte in the Bull Pasture Site.

In 1945, a memorandum of understanding between the NPS and the Smithsonian Institution formally initiated the Interagency Archeological Salvage Program and defined the relationship between the two groups. The Smithsonian Institution established the River Basin Surveys to carry out archeological survey and salvage projects throughout the nation. The Smithsonian Institution, through the River Basin Surveys Program, assumed responsibility for field investigations; provided technical supervision and personnel; and served as liaison with the NPS in planning and programming. The NPS served as liaison between the various participating agencies; was responsible for overall program planning, funding, and administration; and enlisted the cooperation of state and local institutions. State and local institutions often provided space for field offices and laboratories; furnished advice and assistance through institutional staff; and carried out their own survey and salvage efforts, often by means of cost-sharing contracts administered by the NPS.

The role of Reclamation and the Corps was, of course, to plan and implement their water control programs of dam-building and reservoir construction, and in addition, to share their water resource development plans with the NPS and the River Basin Surveys. In the earliest stages of the Interagency Archeological Salvage Program, Reclamation and the Corps also provided funds for the archeological salvage work. After 1947, Congressionally-appropriated funds were administered through the NPS.

The Work

From 1946 through 1967, the substantial sum of $9,000,000 was expended on Interagency Archeological Salvage Program field investigations in prospective reservoir locations throughout the United States. During these years, River Basin Surveys research offices were established in Eugene, Oregon; Austin, Texas; Berkeley, California; and Lincoln, Nebraska. Surveys in more than 500 reservoir areas in 43 states led to the recording of an estimated 20,000 sites.[4] Following survey, over 500 major excavations were conducted to further document significant

Specimen processing desks, Missouri Basin Project Laboratory, Lincoln, Nebraska, 1964. From left: Lee Madison, museum aide; Donald Blakeslee, museum aide; Gaillard Jackson, labor; Clarence Johnson, museum aide; and John Ritch, museum aide.

prehistoric and historic archeological sites prior to inundation. Despite chronic problems with analysis and reporting subsequent to field work, a 1968 bibliography of works resulting directly from this program[5] lists more than 2,600 published and unpublished reports which were the immediate result of Interagency Archeological Salvage Program projects.

The Missouri Basin Project

The Missouri River basin was the focus of the first Interagency Archeological Salvage Program work. The project office in Lincoln, Nebraska, formally called the Missouri Basin Project, was also the largest and longest-lived of the River Basin Surveys field offices. The Missouri Basin Project existed for nearly 23 years, during which time it was central to River Basin Surveys program activities. Waldo R. Wedel was its first director; employment on the Missouri Basin Project field projects trained hundreds of students in archeological field and laboratory techniques. Many of these trainees went on to successful professional archeological careers.

During its lifespan, the Missouri Basin Project gathered massive amounts of data on prehistoric and historic archeological sites along the Missouri River and its tributaries, even as dam closure and reservoir flooding began to cover the very resources being studied. Petsche's 1968 bibliography contains 898 entries for states which border the Missouri River, or 34.5% of all reports listed. Lehmer noted that as a result of the Interagency Archeological Salvage Program over 800 sites were recorded in the Missouri River valley and more than 1.5 million artifacts and specimens were cataloged at the Missouri Basin Project alone. Archeological work in the Missouri Basin Project continues to the present through reservoir shoreline monitoring, stabilization, and salvage under the direct auspices of Reclamation and the Corps on lands they respectively administer.

In 1969, after the major Missouri River dams were completed, the River Basin Surveys program was officially dissolved and responsibility for administering the Interagency Archeological Salvage Program transferred to the newly-established Midwest Archeological Center of the NPS. The Midwest Archeological Center continued to carry out Interagency Archeological Salvage Program work in the Missouri basin until the passage of the Archeological and Historic Preservation Act of 1974. This work included several projects in Reclamation project areas and was funded with money transferred to Midwest Archeological Center by Reclamation. The new law authorized all federal agencies to expend funds for archeological investigations in connection with agency programs and activities. Consequently, many federal land-managing bureaus hired archeologists and other cultural resource specialists to help administer these responsibilities. Reclamation was one of the first to respond to this expanded authority, and soon administered many archeological investigations under the guidance of Senior Reclamation Archeologist Ward F. Weakly, who was hired for that purpose in 1974.

Lessons Learned

Cultural resource management archeology had its beginnings in the Interagency Archeological Salvage Program with its innovative and enduring multi-disciplinary and multi-agency approach. Perhaps more importantly, the recruiting and coordination of multi-disciplinary teams of archeologists, paleontologists, historians, and hydraulic engineers for the salvage of archeological resources in the face of impending inundation and destruction served as a model for what later became the field of conservation archeology.[6]

Despite the many positive results of the Interagency Archeological Salvage Program, it was unable to avoid many of the problems anticipated by the planning committee of 1944/45. Without doubt, one of the most immediate and continuing problems facing archeologists and agencies is the progressive destruction of archeological sites and environs along the reservoirs. Shoreline fluctuations and bank destabilization

Garrison Reservoir, McLean County, North Dakota, 1952. Campfire scene at G.H. Smith's Camp. From left N. Joyner, R. Brown, R. Bonier, G. Baldwin, G.H. Smith, L. Bear, G. Metcalfe, J. Cotter, L. Madison, R. Prince, T. White, D. Farrell.

Photos courtesy National Anthropological Archives, Smithsonian Institution.

continue to take a heavy toll on these resources, and once resources are exposed by these processes, the work of professional and amateur looters assures even more rapid destruction and degradation of these sites.

The scattering of collections and loss of data is a second "most important problem" faced by contemporary and future archeologists and researchers. While a central laboratory was established in Lincoln for the initial processing of archeological collections from Missouri basin reservoirs, these collections were never gathered into a single permanent repository. Over the years, the Interagency Archeological Salvage Program collections have suffered from inadequate facilities. Overcrowded storage, lack of inventory control, and poor curatorial oversight potentially have damaged the research value of many Interagency Archeological Salvage Program artifacts and associated documents. Many federal agencies and professional societies currently are working to generate standards, guidelines, and policies for the curation of such archeological collections and are seeking ways to correct the problems.

Conclusion

Today, the archeological collections generated by the Interagency Archeological Salvage Program are housed and curated in various repositories including the Smithsonian Institution. However, much to the frustration of researchers interested in previous work, done in a particular locale or region, is that there is no convenient or ready way to ascertain the existence, extent, or location of many individual collections. Modern web technology, however, holds the potential for institutional web site listings of Interagency Archeological Salvage Program archeological collections and records, which would be an invaluable tool for present-day and future researchers.

The Interagency Archeological Salvage Program began modestly, but with much promise, in 1945. In less than 30 years it produced, through the enormous efforts of many people and agencies, an unmatched and irreplaceable heritage of archeological practice and material data. Perhaps it is once again time for concerned archeologists to attempt another multiagency effort in order to develop a unified program to ensure that Interagency Archeological Salvage Program data—so painstakingly collected—continue to be available for future use.

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William D. Lipe

A View From the Lake

The Dolores Archaeological Program in the McPhee Reservoir Area, SW Colorado

In 1997, I cruised McPhee Reservoir in a boat, trying to recognize the locations of archeological sites excavated during the Dolores Archaeological Program between 1978 and 1983. It was only with great difficulty that I could relate what I was seeing to the familiar geography of the fieldwork days. Although the filling of the lake has obscured the actual sites, the passage of time makes it easier to gain a perspective on the program's contributions.

The Dolores Archaeological Program (DAP) was one of the largest archeological projects ever carried out in the U.S. and was accomplished in several phases. I will focus on the work done to mitigate the effects of the reservoir and dam construction proper, the DAP. In the following article, Warren Hurley discusses later work associated with constructing the water delivery system.

There were over 1,600 sites, most of them prehistoric, in the Reservoir Project area; 101 sites were tested or partially excavated with 41 receiving more than one crew week of fieldwork. The contributions of DAP included an excellent public museum and federal collections repository at the Anasazi Heritage Center near Dolores, Colorado; a large DAP computer database, accessible at the Heritage Center; training many young archeologists who continue to work as professionals; lessons in the effective organization of large-scale, multi-disciplinary projects; and a number of substantive and methodological contributions to American archeology. I will focus on this last point and ask to what extent the work of the DAP has improved our understanding of southwestern archeology and has increased the power and efficiency of archeological methods.

The underlying premise of the mitigation of adverse effects through "data recovery" is that information gained through study of the archeological record can compensate, in some ways, for the loss of the physical record itself. Therefore, the expenditure of public funds on these projects can be justified only if they result in an increase in knowledge about the past. The development by such projects of more powerful and efficient methods for learning about the past is another way they can meet their obligations to society. I believe the DAP meets these two standards pretty well; below, I'll review what I think are its most important substantive and methodological contributions.

Principal Archeological Contributions

Understanding Puebloan Culture, AD 600-900

Although the lands in and around McPhee Reservoir have sites of many periods, the bulk of the archeological record resulted from intensive use of the area by Mesa Verde Puebloans between about AD 600 and 900, the late Basketmaker III and Pueblo I periods. This period has consistently been interpreted as fitting a model of gradual, progressive change from the late centuries BC to about AD 1300. In this view, early groups were small, scattered, and nomadic. As they gradually added new traits such as farming, pottery, and masonry architecture, their communities became progressively larger, more aggregated, more permanent and more like historic period Pueblos. The DAP pretty conclusively blew this model away and helped loosen the grip of similar implicit gradualist models on interpretation of the archeological record elsewhere in the Southwest.

To make a complex story simple, the Dolores area was settled in the AD 600s by farmers living in dispersed single-family homesteads, each including a large pitstructure with outlying above- and below-ground storage structures and other features. Population size and density increased in the late 700s, declined somewhat in the early 800s, and then rose very rapidly, almost

certainly due to immigration, in the middle AD 800s. A number of very large villages formed between about AD 850 and 880. McPhee Village, the largest, probably had 150 to 200 households (600-1000 people). Population declined precipitously after AD 880, and by AD 900, the reservoir area was nearly or completely unoccupied.

Recognition of this population "boom and bust" cycle raised the obvious question of where the settlers came from and where they went. This stimulated a much broader view of settlement and population dynamics in the Four Corners area among both DAP archeologists and colleagues elsewhere in the Southwest. More recent work has documented numerous large but short-lived villages in the Four Corners area between AD 750 and 900. Not all were contemporaneous, suggesting that some communities either moved more or less intact, or that their inhabitants dispersed and joined existing or newly-forming villages. Large-scale community mobility may have been associated with a farming pattern that resulted in fairly rapid resource depletion, in the context of relatively low regional population density that permitted communities easy access to new lands.

The de-population of the Dolores Valley in the late AD 800s was part of a larger movement out of the northern Four Corners area, probably into the San Juan (geologic) basin of northwestern New Mexico. There, the emigrants may have contributed to the emergence of the early Chacoan center.

Reconstruction of Past Environmental Conditions

Ken Petersen and colleagues in environmental archeology did a masterful job of developing a model of past climactic change and relating it to agricultural conditions in the reservoir area. The model showed generally good agreement with the main contours of project area population and settlement. In particular, the eighth and ninth centuries showed declines in annual precipitation that would have made the high elevation Dolores Valley attractive for farmers, relative to other parts of the northern Southwest. Severe drought in the very late AD 800s and early 900s, coupled with probable short growing seasons in the early 900s, may have contributed to the abandonment or near- abandonment of the reservoir area.

Understanding Processes of Socio-cultural Change

The DAP provided an opportunity for an intensive, multi-disciplinary investigation of prehistoric social and economic change over a relatively short time in a small region. DAP studies showed that population increase in the AD 800s was associated with settlement aggregation, greater formalization of settlement layouts, intensification of farming, anthropogenic impacts on the local environment, elaboration of ritual features and architecture, and some degree of concentration of social power, though not of the sort that was clearly expressed by individual display of status markers. This research remains one of the best-documented case studies of the interaction of demographic, social, and environmental variables in American archeology.

The DAP also challenged prevailing (1970s) models of organizational change that relied on processes operating largely *in situ* within relatively small regions (such as a river valley or mesa). The DAP explicitly attempted to relate changes in the project area to those occurring in the broader Four Corners area, and to consider inter-regional differences in environmental, social and economic "push" and "pull" factors that may have influenced population movement and socio-cultural change.

Development of Archeological Methods

Several methodological contributions stand out. One was the use of archeobotanical samples to document changing patterns of firewood and construction timber consumption as population size and density increased, and as households aggregated into villages. These studies suggest that in the AD 800s, the large Dolores area population had begun to impact the local environment by depleting certain wood resources.

The DAP also contributed to the application of computer simulations to archeological problems. A simulation of population growth through time on a modeled landscape showed that as population rose, household agricultural and foraging catchments increasingly overlapped. One likely response would be for people to move away from fields into villages, where ritual and political measures to resolve resource conflicts could be maintained. In the simulation, the timing of a significant overlap in household catchments coincided well with the archeologically-observed timing of population aggregation into villages and evidence of intensified ritual activity.

DAP researchers did pioneering work in "accumulations research," i.e., the rates at which various kinds of materials are deposited in the archeological record to form assemblages. They used accumulation rates to estimate length of site occupation, and the developed methods for "unmixing" assemblages formed during more than one period.

The DAP labs also contributed methodological improvements. The ceramics analysis program developed methods for refining stylistic chronologies, interpreting vessel use, and determining whether pottery production was at the household or specialist level. Studies of interregional pottery exchange attempted to distinguish changes in trade ware occurrence that were due to population decline in the production areas from those reflecting shifts in trading relationships.

The lithic artifact analysis program developed lithic artifact profiles for assemblages, based on raw materials and broad "morpho-use" tool classes. These profiles proved useful in large-scale comparisons across both inter- and intra-site contexts. A multivariate analysis of projectile point form permitted comparisons between statistical and intuitive point typologies. The large sample of excavated contexts supported an analysis of change in tool kits across the transition from a dispersed to an aggregated settlement pattern.

Data Comparability and Quality Control

The DAP was able to tackle large-scale problems in processual archeology because a serious commitment was made to obtaining comparable, high-quality data sets. This was not easy, because up to 10 excavation crews were in the field at the same time, and the central laboratory operated for several years, with changes in key personnel. Several steps were taken to ensure data comparability and quality

First, a sample of sites was subjected to probabilistic sampling by standard-sized excavation pits. The "probability sample" permitted the estimation of quantities and rates of deposition of various kinds of artifacts and ecological samples for various periods. Second, much effort was invested in developing and implementing standardized field forms. Third, DAP lab personnel rigorously checked field and lab records before they were entered into the computer database. Finally, a comprehensive computer database was developed, despite the relative primitiveness of the hardware and software available at the time. A recent Colorado Historical Society grant has funded conversion of the database to a contemporary format, so it can continue to support new research.

Conclusion: Dissemination of Results

I conclude by returning to the question I started with—to what extent did the public funds spent on the DAP result in an increase in knowledge about the American past and an improvement in our ability to learn about the past through the practice of archeology? I think I have made a case that the DAP made important contributions of both sorts. To fully answer the question, however, we must also consider how effectively knowledge about these contributions has been disseminated. No matter how good the research has been, if scholars and ultimately the general public never learn about the results, the social benefit of the project remains unfulfilled.

First, by creating the Anasazi Heritage Center, the DAP ensured that information was made directly available to the public—not only about the project itself, but about the archeology of the Four Corners area. The Center continues to develop new exhibits and public programs.

Second, the 13 weighty DAP technical reports were produced in a timely manner and were distributed to a number of university libraries, as well as to state and federal agencies. Over 200 other technical reports were given more limited distribution.

Third, a number of theses, dissertations, journal articles, and book chapters have been based on DAP studies and data, many of them undertaken independent of DAP funding.

Despite these efforts to disseminate project results, I continue to be surprised at how long it has taken for some of the principal DAP findings to become incorporated into the general southwestern archeological literature. I don't think that there is any evil conspiracy afoot here. It is just that even accomplished scholars quail at the thought of having to read lengthy technical reports about a project outside their own research area in order to learn the main results of the work. I am not saying that technical reports of this sort should not be published; on the contrary, detailed documentation is absolutely essential to fulfilling a project's obligations to science and ultimately to the public. These basic reports will continue to be valuable reference works far into the future.

However, the peer-reviewed journal articles and book chapters based on DAP data but often not directly supported by the project have been much more effective than the technical reports in widely disseminating the DAP's principal substantive and methodological contributions. These publications are short and are published in journals and books circulated at a broad regional or national level.

In retrospect, I wish that some of the DAP fieldwork, analysis, or technical reporting had been cut back just a bit so that key project staff members could have been funded to produce a series of peer-reviewed journal articles or one or two books for submission to a major academic or trade press. Such works would have been addressed to archeologists, but would also have made the project findings more quickly accessible to a variety of public interpretive specialists as well (e.g., journalists, free-lance writers, K-12 teachers, museum exhibitors, video producers, etc.). In other words, dissemination of the project's most important contributions to knowledge would have relied on the standard, existing system of journals and presses that scholars, educators, media specialists, and the public depend on when they want to learn about what is happening in archeology.

In summary, the DAP has made and continues to make a significant contribution to our understanding of what happened in the past in the northern Southwest and to our ability to do better archeology in the future. The large investment of public funds in this project has paid off in many ways, including the direct provision of interpretive materials to the public through the Anasazi Heritage Center, the prompt publication of detailed technical reports, and the continued availability of collections, records, and a large database to support additional research. Dissemination of the principal project results might have been improved if one or more compact book-length syntheses or a series of journal articles, or both, had been produced by the project at its conclusion.

Further Background

Breternitz, David A., Christine K. Robinson, and G. Timothy Gross (compilers), *Dolores Archaeological Program: Final Synthetic Report.* USDI Bureau of Reclamation, Engineering and Research Center, Denver. 1986.

William D. Lipe is Chair, Department of Anthropology, Washington State University, Spokane, Washington, and Research Associate, Crow Canyon Archaeological Center, Cortez, Colorado.

Great Cut Dike in the Delores Project, Colorado. High altitude downstream view shows finished dike embankment with left and right weighted zones and riprap center. Intake channel is in the foreground with Canal Outlet Works control and gate structures behind it. Pumping plant excavation is underway in center of photo. Photo courtesy J. Fleetman, Bureau of Reclamation.

Warren F. X. Hurley

A Retrospective on the Four Corners Archeological Program

The Dolores Archaeological Project (DAP) was one of the largest cultural resources mitigation programs in American history. It spans a time frame of approximately 25 years at a cost of approximately $25 million. The initial surveys in the 1970s for the Dolores Water Project indicated large numbers of complex and well-preserved archeological sites would be impacted by project construction. Therefore, in 1980, Congress passed legislation allowing for 4% of authorized project costs to be dedicated to the recovery and preservation of archeological materials.[1] This not only expedited construction of the water project, but was an opportunity to transcend the "salvage" mentality that was so pervasive in cultural resources management in the mid-to-late 1970s. Indeed, the work conducted by the University of Colorado under the direction of David Breternitz and William Lipe at McPhee Reservoir (typically called the Reservoir Dolores Archaeological Program or RDAP), and continuing with the efforts of the archeologists cited presently, set the standard for subsequent large-scale archeological mitigation in the Southwest.

The DAP occurs in the Colorado portion of the Northern San Juan Region, an area best known for its extensive Pueblo II and Pueblo III Anasazi or, if you prefer, Ancestral Pueblo ruins. This paper emphasizes DAP data recovery conducted after the conclusion of mitigation for RDAP. To reduce confusion, I will refer to the post-RDAP collectively as the Four Corners Program.

Beginning in 1983, a series of consecutive contracts with private consulting firms was issued for the Four Corners Program. By 1995, fieldwork was complete.

In comparison to the RDAP which conducted excavations at 101 sites centered within the McPhee Reservoir takeline (see the article by Lipe in this issue), the Four Corners Program conducted excavations at 145 sites along a 60-mile arc which extends from the Utah border south of Sleeping Ute Mountain to Dove Creek and Hovenweep. While the RDAP's primary contributions were to the understanding of late Basketmaker III/Pueblo I and historic Euroamerican occupation of the Dolores River valley, the Four Corners Program's significant contributions are to the Late Archaic/Basketmaker II, Basketmaker III, Pueblo III, and historic Ute/Navajo periods. The absence of early Pueblo II components reinforced RDAP findings that a brief exodus occurred in this part of the Northern San Juan Region in the early part of the 10th century.

As another function of a project configuration, the Four Corners Program utilized site-specific research designs and intensive data recovery, while the RDAP employed a broad-based research design and extensive sample excavation strategies. Both approaches have their advantages

Conservators applying consolidant to Mural Section IV in Pitstructure 6, Knobby Knee Stockade.

and disadvantages. While the RDAP enabled examination of community systems and settlement within a large contiguous area, the Four Corners Program provided a cross-section of an extended area and enabled the examination of activity areas within sites. Therefore, the Four Corners Program complemented the RDAP in terms of the cultural/temporal manifestations investigated and the methodology employed.

The following is a summary of what I consider to be the most significant findings of the Four Corners Program, or what has piqued my interest the most. This program intersects with three (southwestern, northern, and Mesa Verde core) of the four subdivisions of the Northern San Juan Region as defined by Fuller.[2] Below are the primary findings in chronological order.

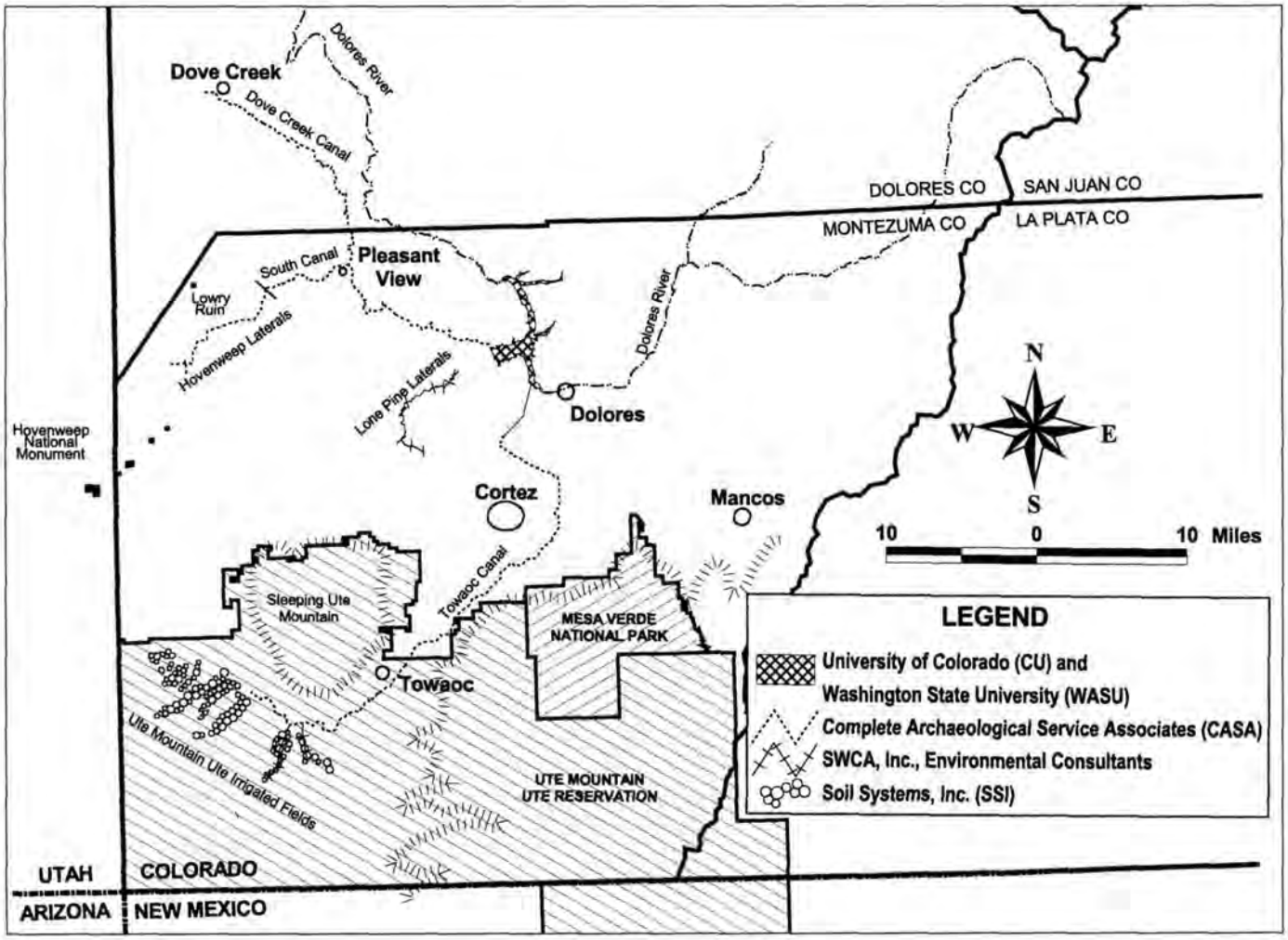
Late Archaic/Early Basketmaker II—Land Use on the Ute Mountain Piedmont (500 BC–AD 100)

Among the 21 sites with Late Archaic and/or Early Basketmaker II components investigated during the Four Corners Program, the most significant is 5MT10525, excavated by Soil Systems, Inc. (SSI), consultant to the Ute Mountain Tribe, on the southern piedmont of Sleeping Ute Mountain. It is the earliest site with pithouse architecture yet found in the southwestern corner of Colorado. While radiocarbon dates (between 405 and 75 BC) are within the range of Basketmaker II, the En Medio Phase projectile point assemblage and lack of cultigens suggest that the site was possibly occupied by Late Archaic peoples.

This site raises new questions on land-use patterns and seasonality for the Late Archaic/Early Basketmaker II Period. The permanent architecture, artifact assemblage, and the presence of an interior hearth imply the site may have been occupied in cold weather months.[3] This type of land-use pattern may have set the stage for the beginnings of horticulture.

Stockaded Basketmaker III—Sites on the Northern Periphery (AD 600-700)

An unusual concentration of sites with stockaded features was excavated on the northern periphery of the Northern San Juan Region by Complete Archaeological Service Associates



Location map for the Dolores Archaeological Program. Bureau of Reclamation map.

(CASA) and SWCA, Inc. All together, 11 Basketmaker III sites with stockades or possible stockades have been identified within a 10-mile radius of Pleasant View, Colorado. Stockades are inferred by a series of postholes which encircle the central pitstructures. They are presumably latticework of small poles and brush woven into and supported by closely spaced posts.

A variety of theories exist that explain the function and distribution of these features. Suggestions have ranged from such mundane tasks as turkey management, containment of children and dogs, or midden garden enclosures, to defensive fortifications for pioneering settlements on the northern frontier.[4]

The location and condition of this cluster of stockaded sites appear to support the latter suggestion for the Basketmaker III period. Chenault and Motsinger cite the "... extensive burning and rich artifact assemblages ..." at these sites as evidence that "... warfare is the best explanation for their destruction."[5] Since the Basketmaker III Period represents the earliest colonization of this area it is likely that nomadic groups were displaced, which may have led to conflict.

This may be some of the earliest direct evidence of warfare in the pre-Puebloan Northern Southwest. The phenomena of burned and stockaded Basketmaker III hamlets are now well recognized and a large contribution has been made to the understanding of early colonization (and the limits thereof) in the Northern San Juan Region.

Evidence of Cannibalism at Early Pueblo III Sites (AD 1125–1150)

CASA and SSI excavated a suite of six sites on the southern piedmont of Sleeping Ute Mountain that date to the Early Pueblo III period. Four sites are within a 1 km by 2 km area and are part of the late Cowboy Wash Community. The Cowboy Wash sites share a common thread; all were suddenly abandoned in AD 1150 and contained disarticulated human remains. The context and disposition of these remains have been interpreted as evidence of violence and possible cannibalism.[6, 7] This finding corresponds with other evidence of early Pueblo III cannibalism in the lower Mancos River drainage[8] and elsewhere in the Mesa Verde Region.[9] Brian Billman argues that cannibalism did occur at Cowboy Wash, and the physical and contextual evidence is compelling. It was a possible consequence of two factors: severe drought and the social and ideological breakdown due to the collapse of Chaco Canyon roughly 10 years prior.

The sites of Cowboy Wash share a number of similarities indicating the inhabitants may have been an immigrant community from the Chuska area, to the south. The Chuskans, perhaps viewed as interlopers, may have been victims of intercommunity strife.

Conclusions of cannibalism should be approached with caution. Billman has interpreted this case as a short-term response to a situation of competition for limited resources, not a motif of Puebloan culture. Unfortunately, the Cowboy Wash findings have been recently sensationalized in the popular media, before the evidence could be rigorously peer-reviewed and published in scholarly fashion resulting in incorrect characterizations of Puebloan society.

Preservation of Mid-to-Late Pueblo III—Material Culture (AD 1150–1275)

Among the more important findings on the Four Corners Program were kiva murals at two sites on the Hovenweep Laterals. The uncovering of these features posed a particular challenge to the excavators and conservators, because of their fragility, and because they were integral to the walls of the kivas. Preservation of the murals was of tantamount importance because the only other good example in the area, from Lowry Pueblo, has since disintegrated. Because the structures were going to be destroyed by construction, backfilling to preserve the paintings was not an option. While only limited conservation technology existed, and methods for removing intact mural sections had to be developed in the field, the removal of the mural sections was an unqualified success. They are now conserved at the Anasazi Heritage Center in Dolores where they were recently on display as a part of the "Fragile Legacy" program. These are some of the best preserved examples of Pueblo III wall paintings in the Northern San Juan Region.[10]

The mid-to-late Pueblo III findings are remarkable for other aspects besides the murals: the masonry architecture and the rich ceramic assemblage was well preserved and is emblematic of the fine artistic traditions of the Northern San Juan Region.

Pitstructure 6 at Knobby Knee Stockade.

Historic Archeology on the Ute Mountain Ute Indian Reservation (AD 1880-1950)

Nine historic sites were excavated as part of the Four Corners Program.[11, 12] Archival research and oral histories supplemented this endeavor. Prior to the Four Corners Program, historic archeological research on the Ute Mountain Ute Reservation was virtually nonexistent. The investigations revealed a pattern of livestock grazing and seasonal use of the Ute Mountain piedmont from the 1880s to the 1950s by the Ute and maybe the Navajo. The findings demonstrated a contrast in historical land use patterns between the Ute Mountain Utes and the neighboring Southern Utes, and established a preliminary site typology for the area.

Notes

1 David A. Breternitz, "The Dolores Archaeological Program: In Memoriam," *American Antiquity* 58:1 (1993): 120.

2 Steven L. Fuller, *Cultural Resource Inventories for the Dolores Project: The Ute Irrigated Lands Survey,* Archaeological Research Associates Four Corners Archaeological Project Report 13. Cortez CO, (1988): 18-19.

3 Brian R. Billman (editor), *The Archaic Period Occupation of the Ute Mountain Piedmont,* Soil Systems Publications in Archaeology No. 21, Phoenix AZ, (1997).

4 James N.Morris, *Archaeological Excavations on the Hovenweep Laterals,* Complete Archaeological Research Associates Four Corners Archaeological Project Report 16, Cortez CO, (1991).

5 Mark L. Chenault and Thomas N. Motzinger, "Stockaded Basketmaker Sites in the Mesa Verde Region," Paper presented at the 60th Annual Meeting of the Society for American Archaeology, Minneapolis MN, (1995).

6 Patricia Lambert, Banks Leonard, and Brian Billman, "Symposium on Anasazi Cannibalism," Papers presented at the 62nd Annual Meeting of the Society for American Archaeology (1997).

7 Michael Dice, *Towoac Reach III Disarticulated Human Remains,* Complete Archaeological Research Associates Four Corners Archaeological Project Report 22, Cortez CO, (1993).

8 Tim D. White, *Prehistoric Cannibalism at Mancos 5MTUMR-2346.* (Princeton NJ: Princeton University Press, 1992).

9 Mary Errickson, *Archaeological Investigations on Prehistoric Sites, Reach III of the Towoac Canal, Ute Mountain Ute Reservation, Montezuma County, Colorado,* Complete Archaeological Research Associates Four Corners Archaeological Project Report 21, Cortez CO (1993).

10 Susan Thomas and Nancy Mahaney, "Field Conservation of Kiva Murals," in *Archaeological Excavations on the Hovenweep Laterals* by James N. Morris, Complete Archaeological Research Associates Four Corners Archaeological Project Report 16, Cortez CO, (1991): 1105-1113.

11 Ross S. Curtis, *Historical Archaeological Investigations in the Mariano Spring Vicinity, Ute Mountain Ute Reservation, Montezuma County, Colorado,* Archaeological Research Associates Four Corners Archaeological Project Report 23, Cortez CO, (1992).

12 Ross S. Curtis and Brian R. Billman (editors), *The Ute Mountain Ute Irrigated Lands Archaeological Project: The Historic Period Occupation of the Ute Mountain Piedmont,* Soil Systems Technical Report No. 96-15, Cortez CO, (1996).

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Photos courtesy Complete Archaeological Service Associates.

G. James West

New Melones

Public Interpretation of the Archeological-Historical Record

The construction of New Melones Dam was one of the most contentious federal public works projects ever undertaken (Fitting 1989; GAO Report 1983). Politics and activism took place on both state and national levels regarding its construction and final management. All this occurred during a time of evolving federal cultural resource law and regulation. (See sidebar, p. 31.)

New Melones Lake is located in the central Sierra Nevada foothills on the Stanislaus River. The project covers some 10,927 ha. The reservoir capacity is 2.4 million acre ft. with a surface area of 5,058 ha and, when full, has a shoreline of more than 161 km that extends some 38 km upstream of the dam. The construction of New Melones reservoir inundated the much smaller old Melones Dam and reservoir which covered 745.8 ha.

Federal lands at New Melones Lake contain more than 700 historic and prehistoric sites. Documented sites include prehistoric habitation sites, bedrock mortars, petroglyphs, lithic quarries, mortuary caves, historic mines, rail and wagon roads, homesteads, mills, and town sites. These properties represent the remains of ancient hunting camps to 19th-century gold mining boom towns encompassing approximately 10,000 years of human activity (Moratto 1988).

Visitors center at New Malones Lake houses exhibits and artifacts that interpret 10,000 years of human activity in the vicinity of the lake and dam. Bureau of Reclamation photo.

New Melones Reservoir was constructed by the Corps of Engineers (Corps) and transferred to the Bureau of Reclamation (Reclamation) shortly after its completion in 1980. The responsibility to complete the cultural resources programs was transferred to the Secretary of the Interior. The Washington office of the National Park Service's Interagency Archeological Services (IAS) was assigned the task of completing the archeological mitigation. Reclamation was designated the lead federal agency for compliance with the National Historic Preservation Act, and was assigned to manage the historic properties, address the storage and management of the extensive collections, and develop an interpretative program.

New Melones Lake, now a unit of the Central Valley Project, one of the nation's largest federal water projects, has a long and convoluted history of archeological and historical research and mitigation. The project was authorized in 1944 and completed in 1978. Initial archeological surveys were made by the Smithsonian River Basin Surveys in 1948 (Fredrickson 1949). This work was followed by the National Park Service's IAS issuing a series of survey and excavation contracts during the 1960s and 1970s to the Central California Archaeological Foundation; University of California, Davis; San Francisco State College (now University); Greenwood and Associates; and Sacramento State College (now California State University Sacramento). In 1977 the Corps contracted directly with Scientific Applications, Inc. During the transfer of the project from the Corps to Reclamation in 1980, responsibility for cultural resources was transferred to the Department of the Interior with the Heritage Conservation and Recreation Service (HCRS, a

short-lived organization that was established during the Carter administration) responsible for the archeological mitigation program. HCRS contracted with INFOTEC Development, Inc. to complete the archeological mitigation. Throughout this period only the Corps was authorized to do any construction within the project area.

Reclamation Actions

To address its assigned responsibilities, Reclamation has taken a multi-tiered approach by developing an artifact storage facility, a resource management plan, and an interpretative program. With the completion of IAS's archeological mitigation program, the curation of some 416,000 items, plus many lineal feet of archeological documentation generated by more than 25 years of investigations required an immediate resolution. A number of alternatives were explored ranging from approaching existing university run facilities to examining the possibility of a local county museum. The existing university facilities were not desirous to take on the management of such a large collection, plus there was a strong desire on the part of the local population to have the collections maintained locally. Reclamation discussed several alternatives with the local counties and historical societies and, as a result, made the decision to maintain the collections at New Melones Lake. This decision was based on the large, controlled space requirements needed to maintain and keep all items and records together. Agreements were made with both counties involved for the long-term loan of specific items for exhibits.

Using knowledge of the period, Reclamation took on the task of resolving the curation issue. Artifact and archival records for the project area are stored at the New Melones Artifact Storage Facility (NMASF), a 204 m^2 section of a steel warehouse at the former Corps construction headquarters at Peoria Flat. Reclamation modified the structure in 1982 to contain the collections. It has been insulated, has a large roll-up door, a single door entry with dead bolt lock, an alarm system, electrical power, water, sinks, and a toilet. Skylights provide additional lighting and two rotating vents ventilate the space. Storage is primarily in archive boxes on steel shelving and in eight NPS-style museum cases. Enclosing the warehouse is a double perimeter chain link fence with locked gates. Adjoining lands are now used as a state prison camp.

Management of the facility and collections is outlined in an in-house document entitled "Scope of Collections and Guidelines for the New Melones Artifact Storage Facility." The "Scope of Collections and Guidelines" is revised every two years and serves to define the holdings' present and future, and the management of the facility. It covers requests for research, collections standards, loan policies, and standard operating procedures. It also states what actions will be taken to meet the requirements of 36 CFR Part 79 (Curation of Federally-Owned and Administered Archeological Collections) and 411 DM (Managing Museum Property).

After several years of monitoring temperature and relative humidity, efforts are underway to reduce the fluctuations of these two variables. An internal super-insulated structure was installed for storage of records and photographs, as well as temperature sensitive artifacts. Funds were budgeted to seal and insulate the roof in fiscal year 1999. In addition, the floors have been sealed to reduce dust.

The collections were received in various states of storage. Collections from the last phase of mitigation were the best organized, but earlier collections and notes were for the most part in poor condition. Few collections had been stored using archival quality materials. A multi-year program with the Department of Anthropology, University of California, Davis, has been instituted to address the storage needs of the collections. This includes catalog checking (and re-cataloging where necessary), re-sorting, and re-packing with archival quality materials, and the formal accessioning of the collections. Over one year has been expended on this activity, and it appears that two more years may be required.

Resource Management Plans

Resource Management Plans (RMPs) are being developed for various Reclamation projects. One is being developed for New Melones Lake, and cultural resources are an important element in the plan. RMPs are developed by soliciting public input. A series of workshops was held to elicit issues and needs that the public considered important. The plan focuses on the recreational needs, wildlife management, and cultural resource management for the future. The plan lays out the specific actions Reclamation will take

to manage cultural resources. Preservation is the primary goal for cultural resources, and research is considered as a preservation measure.

To assist in the management of cultural resources, the resources have been digitized into a GIS system. Three layers of the GIS mapping are devoted to cultural resources: line, point, and polygon data that refer to specific sites. Because this was one of our first attempts at using GIS for cultural resource data, we have need for improvement. This will be accomplished in the near future and funds have been budgeted for this work. Our goal is to use Arc/Info for a GIS program that will include data on each recorded site on Arc/View that can be restricted for use by the resource management staff and researchers.

Interpretation

Interpretation of the archeological-historical record at New Melones has taken several different directions. The first phase was an interpretative

Issues raised by New Melones have affected many water development projects and have changed western water politics significantly by greatly expanding the public's involvement in the decision making processes. The following sample of statements encapsulates the range of interests and issues that arose around cultural resources.

"New Melones probably represents the worst of all possible situations. The rules were constantly changed by Congressional action. The legal basis for doing (cultural mitigation) work was enacted during construction of the project." (Ward Weakly, Preservation Officer, Bureau of Reclamation, *Union Democrat*, June 12, 1981.)

"Almost from the start, complaints were heard from archaeologists and critics, including some who were associated with the losing bidder, often claiming inadequacies in the research design." (*Modesto Bee*, November 15, 1979.)

"DOI has not complied with Section 106 of the National Historic Preservation Act." (Statement of Knox Mellon, California State Historic Preservation Officer in a letter to Secretary of the Interior Andrus, 1980.)

"If Interior Secretary Cecil D. Andrus fails to increase the flow of water from New Melones Dam to protect upstream archeological sites, the Friends of the River is prepared to sue." (*Fresno Bee*, May 1, 1980.)

"The Friends of New Melones (a short-lived pro-dam group) . . . said a call from its antagonist, Friends of the River, for higher downstream water releases in the Stanislaus River is a 'selfish demand by white water rafters.'" (*Modesto Bee*, May 3, 1980.)

"A University of Alabama cave specialist fears federal archaeologists are going to ignore significant caverns in New Melones Reservoir." (*Modesto Bee*, May 5, 1980.)

"The Me-Wuk Tribal Council has informed federal officials it opposes removal of Indian remains from land scheduled to be flooded by the New Melones Reservoir." (*Sacramento Bee*, 1980.)

"The Western History Association is getting ready to petition the government. . . . There's going to be real political trouble." (Turrentine Jackson, Professor of History, *Union Democrat*, June 12, 1981.)

"The New Melones Dam project has generated intense controversy over many years. Numerous special interest groups have expressed varying views on the uses that should be made of the New Melones natural resources. These groups included archeologists, white water rafters, environmentalists, historians, and agricultural interests. Some of these groups advocated the construction of the new dam and subsequent flooding of the areas and others, like white water rafters, strongly opposed such actions. These conflicting interests, coupled with the extremely long time between the project's authorization in 1944 to its completion in 1978, along with new federal environmental and natural resource laws increased the conflict and controversy over the project." (GAO 1983.)

publication directed to the public. Under contract with Reclamation, Julia Costello wrote a booklet on the historical archeology and history of the town of Melones. Entitled *Melones, A Story of a Stanislaus River Town,* the booklet was edited, laid-out, and printed by Reclamation. Almost a thousand copies were produced. The first printing went quickly and an additional thousand copies were produced. This popular booklet was still in demand long after the second printing was exhausted. To resolve this demand, the plates for additional copies were transferred to the Calaveras County Heritage Council that reprinted the booklet and now sells it at cost. This popular booklet was a runner-up in awards for government publications in 1984.

The second phase of interpretation has been more diffuse, consisting of making long-term loans for interpretative displays at local museums and visitor centers and providing assistance when requested. Long-term loans of objects also were made to the Corps for their visitor center at Knights Ferry downstream of New Melones Dam.

The third and most complex phase has been the development of exhibits to highlight almost 10,000 years of prehistory, history, and natural history. Before any of this could begin we had to negotiate with the Corps for the construction of a visitors center. The Corps designed and built the structure over a period of several years. Included within their design were 1,500 square feet for exhibits that the Corps developed using the input of interpretative consultants.

Once the visitors center was completed, the design and construction of the exhibits could begin. This time-consuming approach was required because of the nature of the New Melones legislation. This process has taken several years and two contractors—one to design the exhibits and the other to build them. For Reclamation, the process has been a learning experience. Budgets needed to be developed for an arena where we had little experience. (We have constructed a lot of dams and canals, but not many exhibits.)

To guide the designers, Daniel Quan and Associates, Reclamation developed a story line for the exhibits. After a great deal of interaction with the designers, the exhibit plans were completed after two years of work. A separate contract was let for exhibit construction. Because the plans were so detailed and the specifications so well developed by the designers, the construction contract could be based on cost and experience, thus avoiding costly proposals. Budget constraints required that the exhibit construction contract cover a three-year period. The contractor, Southern Custom Exhibits, Inc., built the exhibits in Alabama and transported them to New Melones via truck. During the construction period, Reclamation gathered photographs and artifacts, contracted for artifact replicas, edited videos, wrote dialog, and provided the inspection and final approval. The second and final phase was completed in July 1998.

Primary operation of the visitors center is by Reclamation rangers who specialize in interpretation. Trained volunteers assist the rangers and provide an important connection with the local communities. In the three months since opening, almost 4,000 visitors have toured the center.

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Traditional Cultural Properties vs. Traditional Cultural Resource Management

Most archeological investigations in the United States today are undertaken to comply with the National Historic Preservation Act (NHPA). Actions by Congress and the Executive branch during the 1990s increasingly have prescribed how archeologists pursue their profession. Archeology still is a science, but its pursuit today is dictated more by non-scientific interests. Diverse public interests are now directly involved in the decision-making process for archeological sites, and some of these interests, specifically Native Americans, have standing equal to or greater than that of archeologists. Consequently, what is considered acceptable management has changed. Archeologists, particularly those in the federal sector, are becoming involved in activities traditionally outside the realm of their discipline. These changes primarily are due to concerns and interests of the Native American community with the biggest impact being at the "local" level where involvement affects the federal stewardship of Native American cultural resources.

Two aspects of the activities by Congress and the Executive branch are addressed:

- the impacts of these activities on archeologists and Native Americans, and
- Indian trust assets as a cultural resource management issue.

Although these issues most directly affect archeologists involved in cultural resource management, they extend to any archeologist who works on federal lands or with federal funds. Many archeologists view these topics with trepidation, given the animosity that often exists between Native Americans and archeologists. However, the course is set and the discipline, by necessity, will continue to change in this era of tribal self-determination and self-governance. Over time, though, these issues have the potential to rejuvenate and expand the discipline.

Federal Legislation

The Native American Graves Protection and Repatriation Act (NAGPRA), the 1992 amendments to NHPA, and amendments to P.L. 93-638, the Indian Self-Determination and Education Assistance Act, provide for increased involvement of Native Americans in archeology and historic preservation. NAGPRA addresses the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. These parties are to be consulted when such items are inadvertently discovered or intentionally excavated on federal or tribal lands. NAGPRA recognizes Native American "ownership" of these items, a precedent first established by the Archaeological Resources Protection Act which states that archeological resources on lands owned by a tribe or individual Indian landowner belong to that tribe or landowner.

The NHPA amendments mandate tribal participation in the Section 106 process. A federal agency must consult with the tribal government when its activities occur on a reservation. Agencies also must consult with a tribe if an activity will affect a historic property to which the tribe attaches cultural or historic importance. More important, tribal historic preservation programs have the same legal status as state historic preservation programs. These stipulations are an acknowledgment that tribal sovereignty extends into the arena of cultural resource management and, therefore, are an extension of the government-to-government relationship between tribes and the federal government.

The NHPA amendments also specify that "properties of traditional religious and cultural importance to Native Americans" qualify for inclusion in the National Register of Historic Places. To a certain extent, this specification addresses the inability of the American Indian

Religious Freedom Act (AIRFA) to protect Native American sacred sites. This designation also expands the definition of "cultural resource" to include sites that may lack material remains.

The purpose of P.L. 93-638 is to promote tribal sovereignty by allowing tribes to contract federal programs and projects available to Native Americans. The 1987 amendments expanded the act to encompass all agencies within the Departments of Health and Human Services and Interior. These agencies cannot refuse to contract with tribes except under five specific criteria. Further, the agency must assume that the tribe has the capabilities to perform the work for which it is contracting. The tribe determines the activities that it will perform and those that the agency will retain. The only functions a tribe cannot contract are the agency's trust responsibilities although all the activities associated with that responsibility are contractible. Among the activities a tribe can include are the associated archeological activities, although the agency retains the responsibility for compliance and must ensure that any archeological activities conform with agency and federal standards. The agency's role is to provide technical assistance, not only during the performance of the contract but also during proposal development.

In the Bureau of Reclamation (Reclamation), Dakotas Area Office (DKAO), all contracted Indian projects include cultural resource activities. DKAO archeologists provide technical assistance to the tribes in developing their cultural resource capabilities and undertaking compliance activities.

Executive Memoranda and Orders

Several executive actions have impacted, or have the potential to impact, how archeological activities are conducted on federal lands or with federal funds. In 1991, President Bush issued a statement on American Indian policy that reaffirmed the government-to-government relationship between federal and tribal governments. In 1994, President Clinton signed a similar memorandum requiring Executive branch departments, agencies, and bureaus to respect this government-to-government relationship when involving Indian tribes. These actions specify that consultation is the primary component of this relationship.

In 1996, President Clinton signed Executive Order 13007, Accommodation of Sacred Sites, which mandates that federal agencies consult with tribes to identify sacred sites on public lands and to consider the impacts of federal actions on these sites. "Sacred sites" are defined as

> ... any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance ....

This definition parallels that for "properties of traditional religious and cultural importance to Native Americans" in NHPA.

Impacts

The impacts of these federal actions on cultural resource management are threefold:

- Native Americans are now integral players in cultural resource management;
- the universe of what constitutes a cultural resource has expanded; and
- ownership of data and resources is an issue.

The first impact reflects that many archeological resources constitute the material remains of Native American history. Consequently, it is only logical that Native Americans should be actively involved in the management of these resources. The federal legislation increases the ability of tribes to govern their affairs as sovereign nations.

The second impact reflects that Native Americans define cultural resources more broadly than do most archeologists. This broader view is exemplified by the elevated status now given to "traditional cultural properties" (TCPs), or sacred sites. Traditionally, cultural resources were defined by the presence of physical remains—objects, features, building, structures, or architecture. In contrast, traditional cultural properties often are defined by "place" or "setting" (e.g., the Black Hills) and material remains do not necessarily need be present. Archeologists and cultural resource managers can no longer rely on material remains alone to identify such historic properties. Tribal elders and traditional leaders are the ones with knowledge of such sites and must be consulted. But this presents a problem for archeologists and cultural resource managers because these elders often do not want to divulge information about these sites to outsiders. They are skeptical, at best, about working with archeologists and question their motives. More importantly, they consider such information private and to disclose it, especially to a "wasichu" archeologist, would be sacrilegious.

The last impact concerns the "ownership" of data and resources. In the Northern Plains, this

issue is increasingly being raised as tribes become more sophisticated about and more actively involved in cultural resource management. Many believe that not only the resources but any information about them, including published reports, belong to the tribe. These data represent intellectual property rights. These tribes believe that they have the sovereign right to determine who gets access to the data, including the federal agencies that have paid for the collection of this information. It is an issue that, sooner or later, federal agencies are going to have to address.

Archeologists are no longer the sole proprietors and interpreters of pre-European history. Compliance with federal legislation rests with those archeologists and cultural resource managers in the federal sector. However, this legislation potentially affects any archeologist working on federal or tribal lands, working with federal collections, working with tribes, or conducting investigations with federal funds or under a federal permit.

Indian Trust Assets

The latest "hot topic" concerns Indian trust assets (ITAs). ITAs are defined in the implementing regulations for P.L. 93-638 as:

> ... an interest in land, water, minerals, funds or other assets or property which is held by the United States in trust for an Indian tribe or an individual Indian or which is held by an Indian tribe or Indian subject to a restriction on alienation imposed by the United States. (25 CFR Part 900.6)

A spin-off of the executive orders cited above is that agencies must assess the impacts of their activities on these trust assets. Reclamation, as with many other agencies, assesses these impacts through the National Environmental Policy Act process. Because of the involvement of the cultural resource staff with Native American cultural resources and history, they are often assigned responsibility for this assessment. Unfortunately, these assets do not constitute cultural resources as traditionally defined so they cannot be identified through traditional means. The problem faced by many cultural resource staff is how to identify them.

To assess ITAs and the government's responsibility with respect to them, it is necessary to understand the trust relationship between tribes and the federal government. This relationship has been defined through treaties, statutes, executive orders, and legal decisions and is based on the concept of tribes as sovereign governments. When a tribe "agreed" to give up or "cede" lands, rights, or resources to the government through a treaty, the government agreed to provide certain goods, services, and protections. Ostensibly to protect tribal interests, the government placed in trust, or "reserved," the lands, resources, and rights that a tribe did not give up. In setting aside these assets, the government assumed a fiduciary responsibility to protect these assets, thereby cementing the "trust relationship." These lands, resources, and rights comprise ITAs.

For projects within or adjacent to a reservation, ITA assessment is straightforward and is accomplished through consultations with the appropriate tribe and the Bureau of Indian Affairs. The problem is with projects on lands ceded by treaty or executive order. In the DKAO, Angostura, Pactola, Deerfield, and Keyhole reservoirs exemplify this situation. Although removed from the modern reservations, these reservoirs are within lands set aside for the Great Sioux Nation in the Ft. Laramie treaties. The Sioux tribes no longer have direct control of these lands, but the tribes may still retain rights of access for hunting, fishing, or gathering, or rights to the waters and these rights may qualify as ITAs. To determine the status of these rights accurately necessitates a review of the relevant treaties.

The DKAO has undertaken a project to address this issue. The project involves a review of the treaties and executive orders associated with the tribes that either currently reside in or historically occupied the areas served by the office. The purpose is to identify the geographical area covered by each treaty or executive order and any reserved rights that the associated tribe may have retained with respect to this area. Primary sources include Kappler,[1] Royce,[2] the Indian Claims Commission,[3] and the U.S. House of Representatives and Senate library web sites. The product will be a management tool for the DKAO to identify ITAs that may be affected during the planning stages of a project or activity.

It Is a Different World Out There Today!

Today, the activities of archeologists increasingly are determined by legislation rather than by science. While these activities are becoming more circumscribed, the involvement of Native Americans in the management of archeological resources is expanding. Many archeologists, in their role as cultural resource manager, now find themselves more actively involved in Native American issues and these often extend beyond

cultural resources. To a large extent, this new role is a natural outgrowth of the historic association that archeology has had with Native American cultural resources and history.

TCPs and ITAs are outside the boundaries of the items traditionally considered under archeology. However, these classes of resources should be studied by archeologists if they are truly interested in all aspects of human prehistory/history. In a theoretical sense, the identification and evaluation of TCPs, even if they lack material remains, "round out" the archeological record because the use of many of these "sites" extend back in time. Such sites represent another important and integral aspect of the use of the landscape.

The era of Native American archeology with its different concepts of cultural resources is here. For the health and growth of the discipline archeologists need to embrace it as it offers the opportunity to overcome the animosity between Native Americans and archeologists. Archeologists may find their professional training as anthropologists helpful in communicating with Native Americans to find common ground. After all, both groups—archeologists and Native Americans—share a common interest—the preservation of Native American heritage. The two simply have different approaches and interpretations.

Notes

1 Kappler, Charles J., *Indian Affairs: Laws and Treaties,* (Washington, D.C.: U.S. Government Printing Office, compiled 1904-1941, Reprinted: AMS Press, New York, 1971).

2 Royce, Charles C., compiler, *Indian Land Cessions in the United States,* 18th Annual Report of the Bureau of American Ethnology, to the Secretary of the Smithsonian Institution, 1896-97, printed in Washington, by the Government Printing Office, 1899.

3 U.S. Geological Survey, "Indian Land Areas Judicially Established 1978."

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Native American Graves Protection and Repatriation Act Activities

In response to the Native American Graves Protection and Repatriation Act (NAGPRA), the Bureau of Reclamation (Reclamation) has achieved the following:

- Hired a NAGPRA Coordinator to serve as a clearing house of information for staff administering NAGPRA in the field.
- Completed a Summary Report which included information regarding eighteen unassociated funerary objects, one sacred object, and one object of cultural patrimony. The Summary Report was provided to 133 Indian tribes and the Departmental Consulting Archeologist (DCA).
- In consultation with potentially culturally affiliated Indian tribes, inventoried approximately 1,300 human remains and nearly 60,000 associated funerary objects and submitted Inventory Reports to tribes and the DCA. Currently, only 4% of the inventoried items have been assigned a cultural affiliation. However, responsible offices are actively adjusting their inventories, including assigning cultural affiliation, as new evidence is made available.
- Published in the *Federal Register* one notice of inventory completion with a second notice pending.
- Exploring the possibility of the repatriation of culturally unidentifiable human remains through the NAGPRA Review Committee for collections from Kansas and North Dakota.
- Consulting with Indian tribes regarding planned excavations and inadvertent discoveries on Reclamation lands. All Native American human remains and cultural items will, upon request, undergo disposition according to NAGPRA.
- Participated in two dispositions that resulted in reburials when human remains and associated funerary objects were inadvertent discoveries on Reclamation lands.
- Arranged for 83% of its cultural resources staff to take the three-day University of Nevada, Reno NAGPRA training course in November 1999.
- Placed Reclamation's NAGPRA activities and contact information on the world wide web at <http://www.usbr.gov/nagpra/> to allow tribes, other federal agencies, and museums better access to Reclamation's compliance efforts.

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Off the Back Roads and onto the Superhighway

Reclamation Reports

Archeology is a philosophical endeavor. It is also a discipline rooted in history that reports on history. It is also a science that experiments and reports on the human experience; it tests hypotheses, analyzes data, builds cases of discovery, and creates an understanding (both theoretical and real) of human adaptation, interaction, and relationships. Archeologists do many things to perfect their discoveries; they collect, analyze, test, create, simulate, re-create, experiment, and report on their thoughts and findings. Archeology is an exercise of intense concentration that demands organization of thought and product.

Over the past 25 years, reporting archeological research has become an area of critical concern. You may have heard reference to "gray literature": how it is inconsequential, how it is substandard, how it is poor science, and how it is not shared. Yes, there are problems with "gray literature," but they are not unique to Cultural Resource Management (CRM). All reporting outlets suffer from a lack of timeliness, quality of data recovery, quality of analysis, quality of thought, and incompetent writing.

In the early years of American archeology, monographs and major site histories were published by the Bureau of American Ethnology (BAE), the Smithsonian Institution, the Peabody Museum, and other major museums associated with universities and departments of anthropology. These efforts, from the late-19th century to the mid-20th century, form the backbone of every American archeology library. For the Southwest United States, Adolph Bandelier's (1892) report on his investigations in the Southwest, Jesse Walter Fewkes' (1912) report on Casa Grande, Emil Haury's (1945) report on Los Muertos, and Frank H. H. Roberts' (1929) report on Shabik'eshchee Village are but a few of the major archeological works in professional libraries. Reports were sent to libraries, and individuals could purchase copies directly from the BAE. Until 1969, these numbers adequately accommodated the needs of the discipline. For the generation of archeologists that grew up with CRM in the 1970s, however, these works are not available.

Many BAE publications were the result of the River Basin Surveys program, the precursor of modern CRM (Jennings 1985). Primarily written by academic archeologists, River Basin Surveys reports are not generally labeled "gray literature," yet they are the results of "salvage archeology," another moniker of "second tier" status. The "second rate" label vanished, however, once the reports appeared and were received by a critical audience. Despite good effort, the River Basin Surveys publication record was disturbing. Donald Lehmer (1965) was critical of the record produced for the Missouri River Basin, estimating that only 25% of the data recovered was reported by 1964, almost 20 years into the program. While the published reports were excellent, the loss of data and lack of published results was significant.

Problems with publishing and disseminating archeological research are not new concerns. The "Crisis In Communication" discussed in 1974 at the Airlie House seminars (McGimsey and Davis 1977:78-89) is probably not as critical as it once was, but without constant vigilance and reminders, the "crisis" could become a major issue.

In 1974, the Airlie House seminar participants concluded, "... the current mechanisms for communication among active participants in archeology are something less than adequate" (McGimsey and Davis 1977:81). To solve this problem, seminar recommendations included centralization of both internal and external communication, a national newsletter, and greater distribution of data through the use of microfiche

(McGimsey and Davis 1977:83). Publication and distribution of data were identified as areas of critical concern. The increasing cost of publication and the eventual acquisition of reports were seen as real problems. They remain today as even greater problems, as the pace of archeology reporting continues to increase dramatically. Some effective solutions to the first two issues have been implemented, such as the SAA's *Bulletin* and *Archaeology and Public Education* and the National Park Service's *CRM* and *Common Ground.* The sponsors of these public outreach series provide a central focus for the discipline, and offer information to the profession and public.

Publication and dissemination of professional reports and data are another matter, however. Microfiche was the idea in 1974. It has been inconsistently applied, and is no longer current technology. Application of current technology is desirable, but one must recognize the dangers of inconsistent application of the technology, the fact that communication technology developed in the past 25 years has an incredibly restricted shelf life, an organization's inability to change as new, even better, technology is developed, and the inability to transfer data to current technology are all common maladies. As Alan Ferg (1997), archivist at the Arizona State Museum so succinctly pointed out to me recently, "Technology is well and good, but [in] reality there is no better way to preserve data than a hard paper copy." Centralization is another problem as evidenced by the National Technical Information Service (NTIS) and its poor quality of reports, poor advertising, poor participation, and poor record of use.

The Phoenix Area Office (PXAO) began funding large archeological investigations during the mid-1970s, and adopted a philosophy of Cultural Research Management (Rogge 1983:23). Part of that philosophy included demand for high quality research consistent with approaches sanctioned by SAA, larger than usual print runs, and public education components for all major projects. A priority was to get reports to agencies, libraries, CRM companies, and academics to the greatest extent possible especially at the regional level. Report print runs ranged between 125 and 200 copies, a number far greater than usual for CRM reports. Our contractors have routinely printed comparable quantities for their own distribution. As a result, the many volumes produced for the Central Arizona Project (CAP) are in use by academia and CRM alike, and transcend the label "gray literature." Some of these reports are standard reference volumes in Hohokam archeology.

All of the CAP projects included significant public education requirements, as much as 4% of budgets that could be several millions of dollars. Results included brochures, audio-slide productions, narrated videos, teaching plans, traveling and permanent exhibits, open houses, and site tours. The permanent exhibit at the Arizona Historical Society (AHS), Central Arizona Museum, is a case in point. In partnership with AHS, PXAO provided funds and technical assistance in development of the museums' major permanent exhibit on Theodore Roosevelt Dam. This award winning exhibit chronicles the development of Theodore Roosevelt Dam in the early-20th century, the history of hydro-technology, the changing western landscape, and the politics of watering the desert. In 1996, the exhibit won the Dibner Award from the Society for the History of Technology. It was the first civil engineering exhibit to be awarded by that organization.

In 1986, as a direct result of recommendations made during a program review conducted under the auspices of the Departmental Consulting Archeologist, PXAO implemented two new requirements for contractors to further the dissemination of federal CRM activities: to submit articles to major refereed journals, and to propose symposia for consideration by professional societies at their annual meetings. Over the past 14 years the PXAO cultural resource program and its contractors have successfully organized 12 symposia, presented 115 papers, published 34 articles, published 11 books, completed 7 dissertations and 3 masters theses, and received over 10,000 visitors at sites during open houses. The successful *Exploring the Hohokam* (Gumerman 1991) published in 1991 by the Amerind Foundation and University of New Mexico Press (UNM Press) set a new standard for CRM sponsored publications. It will be followed by a similar synthesis of Salado archeology (Dean 2000) from recently sponsored CRM investigations in Arizona's Tonto Basin. Each of these books had or will have print runs of 2,500 books. In addition, the University of Arizona Press has published four Anthropological Papers on behalf of the Arizona State Museum from CAP projects.

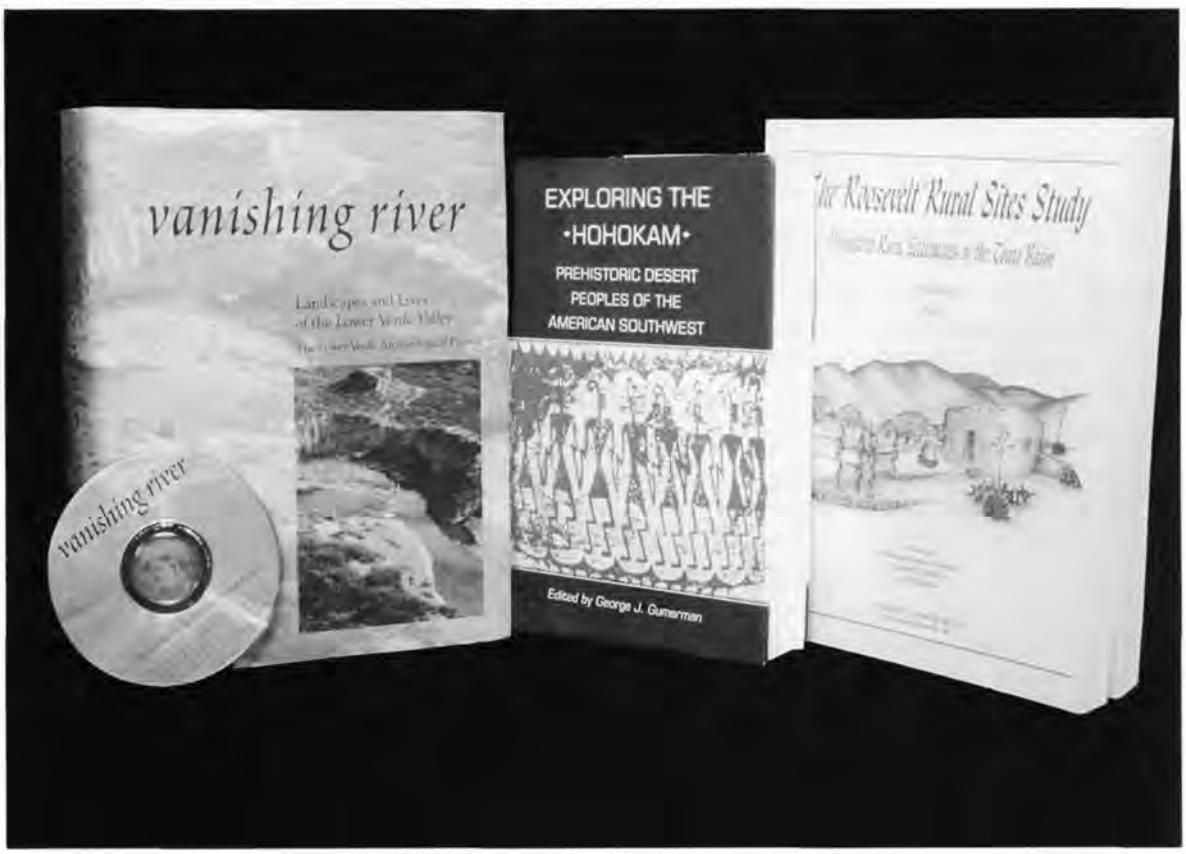
Chances are a number of these activities would have occurred anyway, but the pace certainly quickened once they became a contract requirement. Two important points to remember are that the technical reports and monographs were accomplished with federal financial assistance, these days an increasingly scarce commodity, and they are not "gray literature." They represent the highest quality of archeological production and reporting.

University of Arizona Press also published *Raising Arizona's Dams* (Rogge *et al.* 1995). This work of historic archeology has been favorably reviewed in professional journals. Nonetheless, the most recent review by Mary L. Maniery (1997) still is critical of the information content. Says Maniery (1997:130),

> The text is witty, lively, and compelling, yet details I longed for as an archeologist are lacking. The nuts and bolts research and analysis that formed the basis of [construction] camp life interpretation are not elaborated on ....

This criticism might have been avoided had Maniery taken the time to acquire the other five volumes containing the "nuts and bolts" of this archeology project. In addition to the standard CRM reports, Reclamation, at great expense, produces a popular publication that is acclaimed by both professional and public audiences, and it still gets criticized because the reviewer wants it all in one volume. How can one do more to deliver the goods?

In 1998, PXAO printed the final report for the Verde River Safety of Dams projects. *Vanishing River* (Whittlesey, Ciolek-Torrello, and Altschul 1998) brings complete archeology reporting into the realm of possibilities. The hard cover 800+ page synthesis is not unique by CRM or academic reporting standards. What is unique about *Vanishing River* is the compact disc that contains the entire suite of archeological data and imagery that one would normally find in data volumes and unpublished project documents. With *Vanishing River,* PXAO and its contractor, Statistical Research, Inc., provide it all. The CD is user friendly, linking text, tables, figures, images, appendixes, and references. The CD text reads like a book, is searchable, and may be printed as individual pages or in total. The CD also comes with a digitally-created video of the Verde River project area. The CD was not created with data manipulation as an option; however, data tables can be downloaded and processed using other data manipulation software. V*anishing River* is stimulating, provocative, and of extremely high quality. It is very fresh. I would not hesitate to stack Whittlesey, Reid, and



Recent publications by Reclamation contractors. Photo courtesy Douglas Slowiak, Bureau of Reclamation.

Altschul against anyone Cambridge University Press is currently publishing.

Twenty years ago Fred Wendorf (1979:642) lamented,

> I can foresee a time when archeology may come to be regarded, even by archeologists, as nothing more than a service industry, when archeologists regard themselves as the peers of beauticians and plumbers, who have no obligation whatsoever beyond the simple repair jobs they are called in to do. They may fulfill a contract in the very strictest sense, but will go on from there to the next contract rather than to the assimilation and synthesis of the data....

I happily note that Dr. Wendorf's fears have not become an industry nightmare. The major works of CRM are no grayer than that of academia or the National Science Foundation. In fact, because of CRM's funding possibilities, its reports may shine into the 21st century as world wide publishing on the Internet is implemented along with virtual museums and archives.

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Francis P. McManamon and Fred Wendorf

"Dam Good Archeology"—We're Glad It Got Done!

The Historical Importance of Reservoir Archeology

The articles in this issue of *CRM* cover a very broad range of topics and issues. The history of archeology is here, so are discussions of a series of substantive archeological interpretations, as well as developments of archeological methods and techniques. The examples presented encompass topics and issues of importance to American archeology for the past five decades. Several articles address current resource management issues including dissemination of technical and popular information, how to deal with traditional cultural properties, and the curation of collections and data.

This collection of articles begins by focusing on the historical development of reservoir salvage in the United States from 1945 into the 1960s. This topic, however, merits a longer historic perspective. The earliest systematic "Dam Good Archeology" that we are aware of was along the Nile River in southern Egypt between 1911 and 1915 in concert with the first enlargement of the Aswan Dam. There was a systematic archeological survey of the reservoir area, followed by excavation of many Pharonic age sites and graveyards (see Brew 1961, 1962, and 1969 for details and additional references).

The development and implementation of the first sustained public archeological program in the United States merits the recognition of its importance. It should be a grand celebration for the achievements of many archeologists, historians, and others interested in archeological preservation. Only a few senior archeologists today are able to recall firsthand the days when the resources of the National Park Service (NPS) for archeology were so limited that often only a few thousand dollars could be allocated for the survey and subsequent excavation in a major reservoir. Even then, educational institutions had to be persuaded to "cost share" the true expenses for the project.

This initial approach made possible what we have today (e.g., see Jennings 1985; Johnson 1966). It was during that period that the battle was fought for the hearts and minds of the American people and their political representatives. The issue was to expand recognition that America's historic heritage was important and must be protected. It was a long, hard, and often discouraging battle that lasted more than 20 years, until the National Environmental Policy Act and the effective implementation of the National Historic Preservation Act.

Those who carried out archeological work during this period often had to make hard and sometimes unprofessional compromises about what to dig and how to dig. The saving grace of their actions was that they made these choices in the context of the larger goal. Archeological surveys often disclosed far more highly important archeological resources than could be studied with the funds available. As a consequence, important sites were destroyed with a minimum of protest because it was recognized that the protest would not be supported in the courts, or by society in general, and to protest would alienate an agency or corporation which in the future might be more supportive. It was often noted that the archeological goal was to salvage a 10% sample, the reality in the field was more often only 1% or 2% of the sites were excavated.

There are also many unsung heroes of those battles, among them National Park Service officials like Ronnie Lee, Chief Historian, who risked his job in his effort to preserve our heritage, and Jesse L. Nusbaum, the first Departmental Consulting Archeologist, who defied his Washington superiors to enlist the aid of the Navajo tribe to force the first pipeline

archeology project. They were men of true courage. They include men like C. O. Erwin and W. J. Keller who began the first statewide highway archeological project without any legal authority except the belief that it should be done. We should also recognize people like J. O. Brew and Fred Johnson, both distinguished scholars who spent much of their professional careers working for legislation to support public agency programs preserving our historical heritage. And we must not forget those citizens of Arkansas and Missouri, led by Bob McGimsey and Carl Chapman, who played a major role in the passage of the "Moss Bennett" bill, a landmark on the road to a national policy to protect our historic heritage.

In his article, Simonds reaches way back to recall that the Bureau of Reclamation, which figures prominently in the development of salvage archeology, is nearly a century old. He reminds readers that we owe a debt to President Theodore Roosevelt for the Antiquities Act of 1906 (Lee 1970; McManamon 1996; Rothman 1989). Simonds points out that the archeological research program conducted as part of the national program of dam and reservoir construction carried out by four federal agencies, the Bureau of Reclamation, the Corps of Engineers, the National Park Service, and the Smithsonian Institution, was essentially voluntary until the enactment of the Reservoir Salvage Act in 1960, 15 years after the initiation of the archeological program. We are fortunate that the proponents of the River Basin Archeological Salvage Program and their allies in the federal organizations that carried out the program were willing to interpret the Historic Sites Act of 1935 broadly enough to include salvage archeology. Today such a general authorization might not be judged legally sufficient.

Much more recent was the experience with large publicly funded archeological projects in the "make work" relief efforts of the 1930s. This must have helped pave the way to support the new proposed program for the river basin investigations. The New Deal archeological programs provided an important precedent.

The River Basin Surveys Program developed out of the realization that important archeological sites were going to be destroyed by the construction of dam and reservoir projects planned for the post-war years. In the article by Snyder, Hull-Walski, Thiessen, and Giesen, the beginning of this program and its relationship to earlier public programs in American archeology is described in some detail. They mention the various public archeology programs associated with the work relief programs of the 1930s, the CCC, CWA, and WPA. The experiences of those archeologists who took part in the Depression era archeological program also influenced how the River Basin Surveys was organized. As a consequence, efforts were made to avoid the most serious defects of the earlier public programs: inadequate funding, lack of central direction, insufficient archeological supervision, lack of consistent administration, delay in the publication of results, and the scattering and loss of data and collections.

To provide a "guiding force" for the archeological salvage program, the archeological and scientific organizations that originally proposed the program established a Committee for the Recovery of Archeological Remains. The work on the River Basin Surveys provided a model for public archeology during the 1950s and 1960s. Others, in particular Jesse Nusbaum of the NPS and Fred Wendorf, then at the Museum of New Mexico (e.g., 1962, 1963), initiated similar archeological survey and data recovery programs in conjunction with pipeline and public highway projects (McGimsey 1998). By the 1960s, the National Park Service was referring to its extensive activities in this variety of public archeology projects as the Interagency Archeological Salvage Program. This became the model for public archeology into the 1970s, and provided the framework for the "Moss Bennett" act and the Public Archeology approach advocated by McGimsey (1972, 1985, 1989) and Davis (1972).

The articles in this issue can be read as summaries of the substantive, methodological, technical, and administrative history of the developing public archeology program in our recent history. For example, Blasing's article describes archeological investigations at Medicine Creek, Nebraska, where the initial River Basin Surveys work occurred between 1946 and 1948. The Glen Canyon Project described by Lindsay was conducted between 1956 and 1963. [Editors' note: The full text version of Lindsay's paper can be found at the Reclamation cultural resources web site.]

Button and Ferguson discuss archeological investigations undertaken by the Bureau of

Construction crews lining the CAP Aqueduct with concrete. Photo courtesy Bureau of Reclamation.

Reclamation Southwest Regional Office between 1975 and 1985. [Editors' note: The full text version of the Button-Ferguson paper can be found at the Reclamation cultural resources web site.] They summarize the impressive extent of reservoir archeology projects in Texas, Oklahoma, and New Mexico. One problem they discuss is the limited use made of the data from those projects by archeologists. They suggest those are just not very "sexy," and they use this to defend a policy of not requiring the publication of the major results of their projects in regional and national journals. While not a problem unique to this region or era, nevertheless, we feel that merely filing these reports with a few other public repositories does not fulfill the requirement of appropriate dissemination of the information acquired at such public expense. Button and Ferguson also believe that the collections and data they summarize have not stirred up much interest because they are perceived to have come from "peripheral" areas. We are reminded of a statement by Kidder, who once said that the archeology in the Southwest was important because that's where the archeologists were. Every area is important in helping us understand the past. One has to study it and report on it for it to be integrated into our existing body of knowledge. Strong publications arouse the interest of other archeologists and stimulate intellectual exchange.

Other interesting papers include those by Lipe who summarizes the many scientific contributions of the Dolores Archaeological Project conducted between 1978 and 1985, and Hurley who discusses the archeology done for the irrigation projects related to the McPhee Reservoir from 1983–1997. Among the interesting results noted by Hurley were a stockaded Basket Maker III site that indicated the nature of the Anasazi northern frontier then, and the evidence for cannibalism at an early Pueblo III site in the area. The New Melones Project (1977 to late 1980s) described by West generated substantial controversy over how much archeological work should be done. Teague describes aspects of the Salt-Gila Aqueduct Project (1980–1984) and suggests that the Hohokam were not significantly affected by climactic change, because they had the knowledge and technology to cope with non-catastrophic natural climactic fluctuations.

By the early 1970s, the original paradigm of salvage, or emergency, or rescue archeology increasingly was criticized and replaced by Cultural Resource Management (e.g., see King

1978; Lipe and Lindsay 1974; Wilson 1978). Although emergency archeology resulted in the excavation of sites and the preservation of some data and remains, critics justifiably pointed out that too frequently thorough description, analysis, and synthesis of the investigation results did not follow the excavations. We also know now that the collections and records from many salvage projects were poorly cared for after the investigation ended and, along with the lack of attention to curation associated with more recent work, these failings contribute to the contemporary problems of archeological curation and collections management. The articles by Snyder, *et al.*, and Lincoln point out these problems with the salvage archeology approach and identify them as a major reason the approach was modified in the early 1970s.

Perhaps because of the limited support in law in the period prior to the mid-1970s, salvage archeology in general rarely attempted to modify development projects to conserve rather than just excavate and thus destroy threatened sites. Under Cultural Resource Management, conservation of archeological sites has become much more common, yet some have carried this approach too far, arguing that no sites should be excavated. Jennings (1985) in his informative history of the River Basin Surveys notes this as an important criticism of Cultural Resource Management. Lipe (1996) also recently argued that a restrictive conservation approach would be detrimental to archeology as a scientific discipline.

One result of the heightened concern about environmental issues during the late 1960s and the 1970s was the enactment of laws to protect important aspects of the cultural and natural environment. Prominent among these laws was the National Environmental Policy Act of 1969. This law required that federal agencies consider cultural resources as agencies reviewed or undertook projects. This law, plus the 1971 Executive Order 11593, also required federal agencies to identify and protect cultural resources on land for which they had jurisdiction or control. These new requirements led to the employment of many professional archeologists in public agencies and private firms to do the required archeological work. This new climate of public archeology is well illustrated in these articles about projects that post date the 1970s (e.g., Fowler 1986; Green and Doershuk 1998; Knudson 1986; McManamon, in press; McManamon and Hatton 1999).

Construction on Salt Gila Aqueduct. Photo courtesy Bureau of Reclamation.

What We have Learned from Dam Archeology

All of the articles present interesting, useful information. Two projects in particular stand out as examples of how far we have come in our efforts to protect and preserve our cultural heritage. They are the Central Arizona Project (described in articles by Teague and Lincoln), in particular the Salt-Gila Aqueduct portion of this large, multi-year project, and the Dolores Archaeological Program in southwest Colorado (described in articles by Lipe and Hurley). The excavations and publications on both of these projects represent the highest standards of archeological scholarship to be found anywhere in the world. They have set standards against which any future project must be measured. Both were appropriately funded, well led, tightly organized, and properly executed. Public education and impressive, on-going public outreach programs have been integral parts of both projects. The resultant collections and data have not been neglected either; curation facilities for the collections and records of those projects also have been provided for as part of long-term planning for the projects. These two projects have shown what can be done where there are appropriate resources and intelligent leadership.

At the same time, we must note that a great deal remains to be done (e.g., see Haas 1998, 1999). One of the strongest criticisms of archeology today is the failure to recognize the basic responsibility to make available to the wider archeological community, and ultimately to the general public, the data and interpretations from the investigations required by law and regulation. Many of the reports in modern public archeology are often criticized for the use of repetitive boilerplate, shallow interpretations, and exorbitant costs. Much of this is a result of an absence of an ethic to publish the results of that work so that it becomes easily available to the world at large through an appropriate journal article or book. Rumors develop when the process is not open and the results are not available for comment and criticism. This particular problem can be addressed easily by those in charge if they would adopt the policy of the Bureau of Reclamation Phoenix Area Office, described in the article by Lincoln, which requires that the results of all projects be published as a condition of the contract.

Three contemporary CRM issues also are addressed in several of these collected articles. These are: curation of collections and records; relationships with Native Americans; and the effective and broad dissemination of technical and popular archeological information derived from the investigations. Lipe notes that the creation of the Anasazi Cultural Heritage Center is one of the primary achievements of the Dolores Archaeological Project. The care for archeological collections and records provided by this facility means these data are available for continued scientific research and to inform the general public in the future. Many of the authors mention the importance of curation and long-term use of the collections and records from the projects they describe. Snyder *et al.*, Lincoln, and West in particular focus attention in this area. Many public agencies have focused new efforts on the "curation problem," both by examining current collection policies related to new archeological field work and by taking steps to improve the care and curation of existing collections (e.g., Childs 1995).

At present, the relationships between those who study ancient American history and the descendants of ancient Americans are complex, varying from cordial and cooperative to hostile. There are a number of laws that address the rights of American Indian tribes regarding archeological resources and other kinds of historic properties. In their article, Banks, Giesen, and Pearson describe these laws and executive orders. They note that great care is needed in interpreting the meaning of these laws and other expressions of public policy. For example, the requirements of the Native American Graves Protection and Repatriation Act frequently are misunderstood. This law does not require direct involvement of Indian tribes in the excavation of Native American human remains, funerary objects, sacred objects, or items of cultural patrimony, nor do tribes have to consent or agree to the excavation and analysis plan except on tribal land. The Native American Graves Protection and Repatriation Act relates only to archeological excavations or inadvertent discoveries of Native American human remains and funerary objects on federal or tribal land, and the legal definitions of these lands are specific in the law and regulations. Except within the boundaries of formal Indian reservations, the law does not apply on private or other kinds of public land. In addition, federal land managing agencies are required to **consult** Indian **tribes** concerning new excavations or when remains are inadvertently discovered on

A 1999 Pawnee re-burial. The grave was inadvertently discovered on Reclamation land. Photo courtesy Nebraska-Kansas Area Office, Bureau of Reclamation.

federal land. "Consultation" is defined specifically in the regulations. The result of consultation is not necessarily **consent** by the Indian tribe for any excavation, scientific recording, description or analysis of the remains or objects. In other words, discussing any proposed archeological investigation or treatment is required, but the agreement of the tribe is not required.

The last general issue that we highlight from the articles in this collection is the importance of effective dissemination of archeological technical and popular information. In their articles, Lipe and Lincoln review what has been done in the past and reflect upon what we have learned from it. Lipe suggests that more project resources should be devoted to synthesis of data to produce interpretations that are more accessible to both professional archeologists and the general public. Lincoln describes how the Phoenix Area Office cultural resource program has taken special steps to insure dissemination of information, both professionally and for the general public. He also describes a new approach to providing technical data in a CD-ROM format that can be utilized easily for new and comparative analyses. Archeology is about information, almost always archeological interpretations require professional analysis; they are not readily apparent without this kind of filter. Effective dissemination and use of data are key components of project completion. To be useful, information must be available.

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Upstream view at McPhee Dam showing dam crest with reservoir filling behind it. Dry, Beaver, and Dolores canyons are left, center, and right background respectively. Photo courtesy J. Fleetman, Bureau of Reclamations.

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