Diné Bítéyah: Papers in Honor of David M. Brugge

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CONDIE

David M. Brugge

BINGGELI

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AWANYU: This quarterly journal was discontinued December 1977. For back issues, contact COAS Publishing and Research at the above address.

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Preface

Dave Brugge has made many contributions to the archaeology, ethnology, and history of the Southwest. While his name is commonly associated with Navajo studies, a quick review of his bibliography shows the diversity and depth of his knowledge of other fields in Southwestern studies. Dave freely shares this knowledge with all of us, be we professionals, avocationalists, or just interested persons. He is patient and clear in his presentation of ideas and thoughts. Dave works quietly and often without notice, for he is truly a humble seeker of knowledge.

Of Dave’s many successes, two are worthy of comment. First, throughout his career, he has encouraged communication between the professionals and the avocationalists. He has brought together these different interests so that all may learn. While living in Gallup, for example, he was very active in the Plateau Sciences Society. During his tenure as a trustee and president of the Archaeological Society of New Mexico, he provided excellent leadership. His second notable success is his role in developing the Navajo Studies Conference. This conference has become a nationally recognized meeting for Navajo scholars and others interested in the Navajo.

Diné Bikéyah (The People’s Land) is a tribute to David M. Brugge for his unselfish contributions to all the people he has touched through his fieldwork, publications, organization memberships, and other contacts. The Archaeological Society of New Mexico is very grateful for Dave’s contributions to the Society and to the study of Southwestern ethnography, especially Navajo studies and archaeology.

Dave provided the Navajo orthography according to Robert W. Young and William Morgan Sr., The Navajo Language: A Grammar and Colloquial Dictionary (1987). The editors thank James Copeland for providing the Navajo words for the title of this volume. The editors also extend a special thank you to Bonnie E. Elder (Busy B.E.E.’s Typing, Las Cruces) for her very professional editorial assistance and word processing for this volume.

Meliha S. Duran
David T. Kirkpatrick
Editors
March 1998
David M. Brugge
(Photograph by Robert LaPlante.)
David M. Brugge was born in Jamestown, New York, on September 3, 1927, to Oswald Adolf Brugge and Frances Margaret Jones Brugge. His only sibling, a sister, was born two years later. (She died in a traffic accident in 1950.) Both parents were born, raised, and spent their adult lives primarily in the Jamestown area. His mother took secretarial training and worked for a time as a secretary. His father grew up on a farm 10 miles east of town, but later moved into Jamestown and began a career as a sheet-metal worker. For much of his career, he served as foreman for the Jamestown Metal Corporation, which made metal doors and frames for buildings, metal fittings for ships under U.S. Navy contracts, and metal office furniture, such as file cabinets and desks. Dave still owns a small metal desk made as a prototype for submarine desks, which his father purchased from the company and which Dave inherited when his parents died.

A third-grade teacher was responsible for Dave’s interest in Indians and, ultimately, for his career in anthropology. One day she mentioned that there were a lot of ruins in Mexico that no one knew anything about, so Dave rushed off to the library and found Stephens (1841, 1843), with Frederick Catherwood’s wonderful drawings of prehistoric ruins. He determined then and there to become a Mayan archaeologist (and, when he reached high school, took Spanish to aid in cracking the Mayan hieroglyphic code). After he discovered Stephens and Catherwood, he read everything he could find on Indians.

Dave’s facility in Spanish and Navajo (which he claims is limited to “useful words and phrases”) began at home. The two major minorities in Jamestown were Swedish and Italian, languages that he heard daily from early childhood onward. His father spoke German, Swedish, and English. Dave has remarked that growing up in such surroundings served to dispel the paranoia many Americans feel in attempting other languages.

Dave attended grade school, junior high, and high school in Jamestown. He worked part-time at a supermarket during high school to earn money for college and worked in a furniture factory after his graduation in June of 1945, planning to attend college in the fall. Instead, he was notified to report for a physical when he turned 18 in September 1945, was quickly classified 1-A, and was drafted in October.

As he was standing in the registration line at the Reception Center at Fort Hancock, New Jersey, he and several other draftees were
pulled out of line and, without stopping for basic training, were put to work in offices vacated by servicemen who had accumulated enough “points” (based on time served in battle, total time in the army, etc.) to receive discharges now that the war was over. Not surprisingly, they departed in hordes, leaving their places to be filled by green draftees. The shoulder patch for Dave’s unit, the Second Service Command, was blue with two interlocking white squares and was known as “the ice cubes.” In an effort to feel they were actually soldiers, Dave and his office colleagues took to running the obstacle course during their coffee breaks—until the Commanding officer put a stop to it, fearing injuries (and lawsuits), since they still lacked basic training.

When the Reception Center was moved to Fort Monmouth, Dave and his office mates went with it. Because the post had been an Officers’ Training School, it possessed a good library, enabling Dave to read Darwin for the first time.

The next move for the Reception Center, Dave, and cohorts was to Fort Dix. With Dave was a Jamestown friend, Bertil Gustafson, who had worked as the town newspaper’s photographer during high school because the paper’s professional photographer had been drafted. One of Bert’s older relatives informed him that reenlisting for another one-year stint would likely bring more interesting duty assignments, perhaps overseas. Bert reenlisted and was sent to the South Pacific to photograph the atomic bomb tests, and then became head of the army’s photographic laboratory in Japan. With Bert for an example, Dave enthusiastically reenlisted, but his adventures were to be less exciting than Bert’s. First, he was sent to Camp Lee, Virginia, for basic training. He was then transferred to another military base on a special job assignment, but was greeted with the news that no such job existed at that base. Within a week, he was back at Camp Lee, where he remained as a member of a holding company (meaning, Dave notes, that the army did not know what to do with them) until he was sent to Fort Jackson, South Carolina. He was discharged from Fort Jackson in the summer of 1947, never having been overseas.

With the G.I. Bill to help with college expenses, Dave enrolled at the University of New Mexico (UNM), graduating with a Bachelor of Arts in Anthropology in 1950 (also taking graduate courses in 1950 and 1954). He remembers his surprise, at first reading college catalogs, to discover that one did not immediately begin taking coursework in archaeology, but must also be trained in cultural anthropology and the other subdisciplines of anthropology. The anthropology faculty then consisted of four permanent full-time professors—Nibs Hill, Frank Hibben, Florence Hawley Ellis, and Paul Reiter, until Stanley Newman arrived as the fifth. Leslie Spier was half-time, spending one semester a year at UNM and the other semester teaching elsewhere.

His first day on the UNM campus was to lead to Dave’s one and only venture as a merchant. He had arrived on a Sunday, booked a room in a small downtown hotel, and made his way to the campus, where he found two other new students wondering how to find the boys’ dormitories (as it turned out, they were in temporary buildings at Kirtland Air Force Base). One of the students was Glen F. (Jim) Wilson, who was from La Junta, Colorado, and had long been a member of the famed Koshare Indian Dance group of La Junta. Dave and Jim were friends from then on, and the two soon became friends of several Navajo silversmiths. Jim promised one Navajo smith, Dave Taliman, that he would
try to find a buffalo hide for his brother, who lived on the Reservation. A year or two later, in 1950, the owner of the Miles Studio, a taxidermy and furrier shop in Denver, died. Choosing to concentrate on the fur business, his widow disposed of all the taxidermy items, and Jim was able to purchase an entire load of buffalo hides. He enlisted Dave’s help, and together they took a hide to Dave Taliman’s brother on the Reservation. Other people were enthusiastic about the hides, but had little cash to buy them with, so Dave and Jim accepted blankets, jewelry, pottery, and other items in trade for the hides. Ending up with little money, but a lot of merchandise, they decided they had better become shopkeepers and rented a shop off the Old Town Plaza on San Felipe Street, which they appropriately named Ayani [Navajo for “buffalo”] Trading Company. Half of the building was a very old adobe structure, which they lived in, and the other half—built of cinder block—was the store. The building was in a poor location, so evening traffic never reached them, and they were under-capitalized from the beginning. The bright side was the buying trips they made to every reservation in the Southwest (and even into Oklahoma), and the friends they made. Dave recalls, for example, Luke Yazzie, a Navajo silversmith located down the street. When he needed money, he would visit Ayani Trading Company and sell them jewelry. When Dave and Jim needed money, they visited him and sold him turquoise. As they became poorer, Dave took a job to help support the store, but finally it dissolved in 1952.

During the Ayani Trading Company years, Dave and Jim had many opportunities to participate in the lives of Indian friends and to glimpse the ways Indian communities operate. They lived at Santa Clara for a week when they helped Dave Taliman and his Santa Clara wife move back to the pueblo because her elderly parent was ill. Dave remembers that he made Dave Taliman’s son a pair of skunk anklets to wear in his first dance. They met a Hopi-Tewa man who had married into Santa Clara and was then composing songs for the pueblo’s dances. Wanting to use a Navajo squaw dance song for a buffalo dance at the pueblo, he came to consult Dave Taliman for the correct Navajo words.

At Cochiti they became acquainted with the drum maker, Marcello Quintana, who had been appointed cacique at an unusually young age. Quintana was an innovator who had organized one of the two baseball teams at Cochiti. The teams were so skilled and enthusiastic that they won several Inter-Pueblo League championships in spite of the pueblo’s small population. In connection with Cochiti, Dave believes Ayani Trading Company may have been the first to market unpainted drums. On a buying trip, Jim noticed a group of drums that were finished but lacked paint. He bought them and found that they sold as readily as painted drums. Nearly all drums on the market now are unpainted.

Besides his partnership in the Ayani Trading Company, Dave spent the years from 1951 through 1958 conducting archaeological surveys and excavations. Excavation projects were at Te’ewi on the Chama River Dam Salvage Project for the Museum of New Mexico, 1951; survey on the Glen Canyon Dam Project for the Museum of Northern Arizona, 1957; and survey and excavation on the Four Corners Pipeline Company Project from the Four Corners to southern California for the Museum of Northern Arizona, 1957–1958. He worked as a seasonal ranger at El Morro National Monument in 1953, then in the Navajo Surplus Commodity Program out of Gallup for the New Mexico Department of Public Welfare in 1952. He pursued independent studies on the Pima Bajo at the
Biblioteca y Museo de Sonora, Hermosillo, Sonora, Mexico, at various times in 1952, 1953, 1955, 1958 (also, later, in 1968), and worked for the Unitarian Service Committee’s Gallup Indian Community Center from 1954 to 1957, first as the recreational and educational coordinator with the Santa Fe Railway’s Experimental Project with Navajo extra gangs at various camps throughout Texas, New Mexico, and Arizona, and later at Gallup.

To the Gallup Center came, in 1957, a volunteer social worker named Ruth Virginia Sherlog. Raised in Fall River, Massachusetts, Ruth had graduated from Syracuse University and was employed in social work in Poughkeepsie, New York, when she learned of the Gallup project. Intending to volunteer for a year and then return to the east, she and Dave met at the Gallup Center and were married on February 21, 1959, in Hermosillo, Mexico. Their wedding banquet was held at a Mexican-Chinese restaurant in Hermosillo. Dave and Ruth had three children—Douglas, born April 20, 1960; Stephen, born November 25, 1961; and Janet, born August 5, 1964. The family lost Ruth in January 1990.

From 1958 to 1968 Dave conducted anthropological and ethnohistorical research for the Navajo Land Claim and Navajo Tribal Research Section at Window Rock, Arizona. He also participated in curriculum development for the Rough Rock Demonstration School at Rough Rock, Arizona, in 1968. Then came 20 years with the National Park Service. He served as the Curator at the Hubbell Trading Post National Historic Site in Ganado, Arizona, from 1968 to 1973; as Anthropologist at the Chaco Center in Albuquerque from 1973 to 1977; and as Regional Curator, Division of Information and Visitor Services for the Southwest Regional Office of the National Park Service at Santa Fe from 1977 to 1988, retiring from the Park Service in 1989. Since his retirement, Dave has served as a consultant in anthropology for the Museum of Indian Arts and Culture of the Museum of New Mexico, the U.S. Forest Service, the Brown and Bain law firm (Phoenix), the Office of Contract Archeology at the University of New Mexico, and other clients.

As the merest glance at Dave’s bibliography will show, his areas of expertise are wide. Among his 150 publications to date are articles and books reflecting projects and interests in archaeology, ethnology, ethnohistory, history, linguistics, ethnobotany, architecture, rock art, material culture (especially ceramics, stone, basketry, and metal), land use, museology, and contemporary Navajo life. A sample of his major contributions to Navajo prehistory and history are Navajos in the Catholic Church, North American Archival Records of New Mexico 1694–1875 (1968, 2nd ed. 1986), A History of the Chaco Navajos (1980), “Navajo Prehistory and History to 1850” in the Southwest volume of the Handbook of North American Indians (1983), Tsegai: An Archeological Ethnohistory of the Chaco Region (1986), and The Navajo-Hopi Land Dispute: An American Tragedy (1994). An important addition to Navajo scholarship is his 1967 Navajo Bibliography, and the revised edition, with subject index, published in 1969, both with J. Lee Correll and Editha L. Watson. He has been called on repeatedly as a reviewer for American Anthropologist, Ethnohistory, New Mexico Historical Review, El Palacio, Arizona and the West, The American West, Pacific Historical Review, The Western Historical Quarterly, American Antiquity, American Indian Quarterly, and other journals.

Recognition of his broad knowledge base is evidenced in his serving as a participant in
School of American Research Advanced Seminars on Cultural Preservation in the San Juan Basin (1979), Southwestern Ceramics (1979), Variability and Change in Navajo Culture (1985), the University of Colorado Anthropology Museum Southern Athapaskan Ceramic Workshop (1985), and discussant for the New Mexico Archeological Council Protohistoric Conference (1989). He has been honored by Project Hope (1973), U.S. Department of the Interior (1982), Southwest Parks and Monuments Association (1989), State of New Mexico Heritage Preservation Committee for Lifetime Achievement in Navajo Ethnohistory and Archaeology (1994), and Friends of Hubbell, Ganado, Arizona (1996). He is a member of numerous national, regional, and local anthropological and archaeological societies.

In addition to a busy scholarly life, Dave finds—or takes—time for causes ranging from supporting the teaching of evolution in the public schools to attempts to rescue the Santiago Hubbell house in Albuquerque, and for his children and granddaughter. Someone once said of Dave, “He is a modern Renaissance man, one of New Mexico’s irreplaceable treasures.” His family, friends, and colleagues would agree.

—Quivira Research Center, Albuquerque, New Mexico

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Of the animals in the Navajo herds, the goat has been the least understood and appreciated by anthropologists and government officials. Anthropologists have tended to treat goats as merely a less valuable form of sheep. Clyde Kluckhohn and Dorothea Leighton (1960:31) remarked that the Navajo kept too many goats and considered their economic value so low that they classified them as “non-productive stock.” William Adams (1963:118–119) reported, for the period of the mid-1950s, that Navajo families “less frequently slaughtered (goats) than sheep despite the fact that the...(goats) have no commercial value.” The Franciscan Fathers (1910:257–258) mentioned goats only in passing under the general heading of “sheep raising.” In part, this is not surprising, since as James Downs (1964:37–38) subsequently observed that while the “goats are in most respects the social and cultural equivalent of the sheep....the Navajo simply appear to be less interested in goats (than sheep). It may stem from the fact that sheep are viewed as the food animal par excellence....Goats are eaten, but much less often than sheep, which is economically inefficient inasmuch as there is little or no market for goat meat....” He also noted that “The herd,...is always spoken of [by the Navajo] as the ‘sheep herd,’ or ‘the sheep,’ although in fact most of the animals may be goats” (Downs 1972:64).

GOATS IN NAVAJO HISTORY

While anthropologists merely ignored the goat, most government officials, particularly during the early part of this century, were openly hostile to goats. To them, goats had little economic value, because they equated economic value with market value. Goats were also judged to be far more destructive to the range than sheep. Thus, perhaps not surprisingly, the government livestock-reduction program of the 1930s targeted goats for special attention. In 1933, just prior to the program, livestock dip counts showed Navajo herds, both on- and off-reservation, numbering 329,994 goats and 822,498 sheep (U.S. Congress 1937:17,979), for a goat to sheep ratio of 1:2.5. In October 1933, then Commissioner of Indian Affairs John Collier told the Navajo Tribal Council that herds had to be reduced and “suggested” eliminating 200,000 sheep and an equal number of goats. Between the fall of 1933 and the fall of 1935, the Indian Service purchased a total of 152,742 sheep and 163,060 goats (Aberle 1966:59–60). In compensation, the Navajo received $2.00 a head for sheep, but only $1.00 for a goat (Farmington Times Hustler
1934), in spite of the fact that the Navajo had paid as much as $4.00 a head for some of these goats (Counselor and Counselor 1954:368).

The removal of the goats presented a major problem. While some animals were shipped out, the market for goats was so limited that most had to be killed on the reservation. As David Aberle (1966:57) stated, "...some were slaughtered and the meat dried and given back to the Navahos; others were shot and left to rot; still others were shot and partly cremated with gasoline. In one place, 3,500 goats were shot and left." Livestock reduction continued through the 1930s, with pressure on the Navajo to reduce the size of their herds and the number of goats in particular. By the mid-1940s, the goat-to-sheep ratio on the reservation had fallen to between 1:8 and 1:9 (Bailey and Bailey 1986:302).

Was the goat always, as many anthropologists and government officials thought, the social equivalent but economic inferior of the sheep? Downs (1972:64) hinted that the economic contribution of goats may have been more important in earlier periods. He noted that "until perhaps three decades ago most goats were nondescript milking breeds, and goat milk was an important part of the Navajo diet. The shift to Angora goats in an attempt...to raise cash income has adversely affected nutrition, especially that of children." Scattered throughout the earlier literature are statements to the effect that goats had been even more economically important than Downs implied. In 1870, J. H. Beadle (1873:547) reported that a student at the Fort Defiance school "informed me that for months at a time she had nothing but goats' milk, boiled with a thin, watery root, which they use for food. Where goats' milk is plenty, the children thrive well on that alone...." Speaking of growing up around the turn of the century, Frank Mitchell (Frisbie and McAllester 1978:32) said that "the only food we lived on was milk. When the sheep and goats were brought in from grazing, people milked them and fed us the milk. That is about all the food we ever ate in those early days; we lived on milk. The people used to make cheese from that milk, too....We used to eat a lot of that cheese." In 1924, the superintendent of San Juan Agency wrote that "practically every family does milk goats and the milk forms a substantial portion of its diet..." (San Juan School Narrative Report 1924:46–47). While many scholars had noted the use of goat milk by the Navajo (Adams 1963:118; Franciscan Fathers 1910:204; Kluckhohn and Leighton 1960:31), they obviously did not consider goat milk and cheese to have any major economic value.

While there was an awareness that the Navajo frequently butchered goats, many scholars did not see chevon (goat meat) as being of any major economic significance. However, writing at the turn of the century, U. S. Hollister (1903:44–47) stated that goat meat was "more generally used for food than that of the sheep." Describing the period of the 1930s, Flora Bailey (1940:272) noted that goat meat was a dietary staple. Also writing of the 1930s, Thorne Carpenter and Morris Steggerda (1939:302–303) observed that the Navajo commonly ate goat meat, and in their discussion of meat consumption, noted the number of goats that had to be butchered per week in order to provide food for families of certain sizes. The strongest evidence for the economic importance of goats is found in the hearings held in the 1930s concerning livestock reduction, particularly in the report of the New Mexico Association on Indian Affairs (Chabot 1941). In summarizing the effects of goat reduction on the Navajo, the report noted that "although these goats were of practically no commercial value, they were
the basis of the poor man’s food supply....the goat...was the proverbial food supply: not only does natural economy prevent the Navajo from killing his sheep, but he prefers kid meat to all other food. The goat is highly productive, bearing two and sometimes three kids a year. Goat milk was widely used both by adults and children, and as a means of feeding orphan lambs. There are evidences that a crude kind of cheese was made. The loss of this native milk supply has resulted in increased purchases of canned milk from the trader” (Chabot 1941:6, 8).

The report also noted that reduction had ruined the chances of younger families who were trying to build up a herd, and that “the middle-aged family heads have never recovered from the first stock reduction. Their chief meat supply was goats” (Chabot 1941:17). Because goats were targeted by stock reduction, the Navajo were forced to depend more heavily on mutton, but even increased sheep butchering did not totally alleviate the problem, since goats contributed more than meat to the diet. The trader at Mexican Water in 1940 noted a “20 per cent increase in the Navajo’s cost of living. Goat reduction didn’t hurt money income, but hurt them at home because they had to replace [the food] with stuff bought at the store” (Chabot 1941:19).

In terms of subsistence, what was the relative value of goats and sheep? Jim and Ann Counselor (1954:368) wrote that “a subsistence herd is geared to the size of the Navaho family. A large Navaho family needs a herd of one hundred and fifty to two hundred goats to furnish it with meat and milk. The kids from fifty to seventy-five goats will supply a smaller family...” In contrast, the Navajo Rights Association claimed that a “larger Navajo family” needed from 400 to 500 sheep (Farmington Times Hustler 1941).

The Krug Report (1948:14) estimated that it required no fewer than 250 “sheep units” to support a family. George Sanchez (1948:14) stated that “to make a modest living,” a family needed 500 sheep. The most precise estimate came from Frank Bradley, a tribal council member. Bradley stated that “my personal opinion as to the amount of sheep needed for the support of a family runs between 400 and 500. I am just referring to where a person absolutely depends on livestock alone...for the support of a family of six to ten children” (Minutes of Navajo Tribal Council 1940:128). While these estimates are in part ambiguous, they do show that in terms of subsistence value a goat had about twice the value of a sheep. Given that goats were better meat producers, as well as providing milk and cheese, such a ratio would be expected.

Why has the economic value of goats been viewed so differently? There are two interrelated factors involved: (1) Anglo-American bias toward goats and (2) historic changes in the role of the herd in the Navajo economy.

**CULTURAL BIAS**

Northwestern Europeans and Anglo-Americans exhibit a deep-seated cultural bias toward goats, particularly in comparison to sheep. This bias perhaps originated in religious beliefs. In many early Mediterranean and Middle Eastern religions, the goat served as an important theme and symbol. With the rise of Christianity, goats increasingly became identified with wantonness, lustfulness, and paganism. Not surprisingly, during the Middle Ages, the goat became identified with the devil and the related practice of witchcraft. The devil was at times described as being half man and half goat. At other times, the devil took the form of a goat. Witches were said to
have intercourse with goats, symbolizing the devil. Witches rode goats, and some were thought to have the power to turn themselves into goats (Russell 1972:105, 183–185, 211, 236–237, 242, 245–247, 255).

In contrast, sheep were the symbol of purity and good. In ancient Jewish beliefs, the believers in the true and only God were referred to as the sheep of God. Christians inherited and continued this dichotomy through the teachings of Christ, with the lamb of God.

Although the beliefs in witches and devils wandering the earth have long been purged from the cultural consciousness of Anglo-Americans in general, the legacy of these beliefs relative to the goat and sheep persist. In our language, goats and goatishness are synonymous with lust and lustfulness. Sheep and lambs are still linguistically identified with purity and divineness. As a result, we speak of separating the innocent from the guilty as “separating the sheep from the goats.”

Precisely how, and if, this negative image of the goat affected its economic role and value is impossible to determine. However, in most areas of Europe, sheep eventually superseded goats as a meat animal, and dairy cattle replaced goats as a provider of milk. The goat retained its economic importance only in those areas of Europe where the pasturage was too poor or the terrain was too rugged for raising sheep and cattle (Zeuner 1963:151). The function of the goat as a meat producer eventually disappeared in many regions. In the British Isles, the English word for goat meat, chevon, even disappeared from the everyday vocabulary of the population. Only two factors kept goats from disappearing altogether in these areas: (1) the goat is an effective small-scale milk producer that is ideally suited for poorer farm families with little pasture, and (2) goat milk continues to be considered more nutritious for babies than cow’s milk (Peters and Deyoe 1946:83; Washburn 1917:131–132, 136).

With the migration of northwestern Europeans to North America, the role of goats deteriorated even further. In reference to Anglo-American bias against goats, R. M. Washburn (1917: 131) wrote that “there is probably no single animal in America which has been the butt of more jokes than the goat....The fact that the goat is spoken of as the ‘poorman’s cow’ certainly does not encourage their being more generally kept.” Thus Anglo-American farmers, because of their relative prosperity, kept even fewer goats than their northwestern European ancestors and relatives.

**HISTORIC CHANGES IN THE NAVAJO ECONOMY**

As food producers, milk goats far exceed sheep in terms of value. As a result, every Navajo family kept goats, while not every Navajo family had sheep. Since a poor family sometimes had only goats, to describe a person as a goatherder implied that he or she was poor.

While sheep were more limited and less productive in terms of food for the family, they had an economic dimension that milk goats lacked. Sheep produced wool, and wool was an important commodity to the Navajo. From it they wove wearing blankets, dresses, belts, and other textiles for use by the family or for trade. Wool and lambs were also marketable trade items. Thus, while milk goats formed the core element in the herd, there was a limit on the number of goats needed by a family for subsistence purposes. A family could have too many goats.
However, because of the commercial aspect of sheep, a family could never have too many sheep.

Although there is little doubt that the Navajo acquired milk goats and sheep at the same time and that Navajo herding involved both animals from the outset, there is some disagreement as to when this acquisition took place. Some scholars (Reeve 1957; Schaafsma 1992) have contended that the Navajo adopted sheep and goat herding into their economy during the seventeenth century. However, the more widely accepted explanation is that the Navajo adopted herding after the Spanish reconquest of New Mexico (1692–1696). Pueblo refugees joining the Navajo brought with them sheep and goats, as well as the knowledge of animal husbandry. Herding became an integral part of the Navajo economy during the early 1700s, while they were in the Dinétah or Gobernador region of northwestern New Mexico.

The importance of goats and sheep in the Navajo economy during the early 1700s is difficult to determine. Spanish accounts from this period are few and mention only small numbers of sheep and goats. These accounts are also frequently ambiguous, frequently noting only the presence of ganado menor or “small stock,” a term used for both sheep and goats (Hendricks and Wilson 1996; Hill 1940). Archaeological studies of eighteenth century Navajo sites note the presence of sheep and occasional goat remains (Carlson 1965; Keur 1941). However, ethnohistoric sources and archaeological findings are extremely limited, and it is impossible to determine the relative economic importance of sheep and goats.

Describing the Dinétah, John Haskell (1975:153) noted that “herbaceous cover is scanty…” and that as a result, the region “…does not lend itself to pastoral activities as it is characterized by deep canyons and lofty mesas…” (Haskell 1975:178). As Tom Harwood, a highly successful Navajo sheepman and head of the District 13 Grazing Committee, once remarked about the Dinétah, “it’s not sheep country.” Harwood said that the area lacked good grasses and was just too rugged and broken. Coyotes would get most of the lambs. The Dinétah was, in his estimation, “goat country” (Bailey field notes 1977–1982). Sheep are grazers that subsist upon grasses. Although goats can subsist on grasses, they are primarily browsers that are capable of foraging on woody plants and other vegetation that are unpalatable to sheep. In addition, goats are more intelligent animals and are capable of surviving in rough, broken terrain. Thus, goats are far more suitable herd animals for people living in the Dinétah than are sheep (Zeuner 1963:13).

The Navajo families living on the margins of the Dinétah today are primarily goatherders (Bailey field notes). Dipping-vat records from the early 1930s also reflect that the Navajo families living in this area were more oriented toward goat raising than Navajo families in other areas (U.S. Congress 1937:17804 and 17979), and trading-post records show that these families traded more goat hides than sheep skins (U.S. Congress 1937:17768–17770).

Unless the vegetation cover and topography of the Dinétah have changed significantly over the past 300 years, the Navajo pastoral economy evolved in a region more suited for goats than sheep. Thus, it is probable that early Navajo pastoralism was more oriented toward the tending of goats than the herding of sheep.

After the Navajo abandoned the Dinétah in the mid-eighteenth century and scattered
westward, several changes occurred. They now occupied the vast grasslands of the Chaco Plateau, the Chuska Valley, and the Chinle Valley—areas ideally suited for raising sheep.

Originally, woolen goods were woven for home consumption. However, during the late-eighteenth and early-nineteenth centuries, a regional market for Navajo textiles evolved (Kent 1985:9–11). So esteemed was the Navajo blanket that by the mid- and late-nineteenth century, the Navajo blanket and the horse were the two standard measures for determining the relative values of goods among the tribes of the Southwest (Ford 1983:720). As the number of Navajo blankets woven for trade increased during this period, the value and numbers of sheep undoubtedly increased as well. However, the estimates of the size of Navajo herds for the period prior to 1863 appear to count sheep and goats together—varying between 200,000 and 500,000 animals (Bailey and Bailey 1986:19–21).

During the Navajo War of 1863 and the period of their incarceration at the Bosque Redondo from 1864–1868, the Navajo lost most of their animals. In 1867, it was reported that the Navajo prisoners at the Bosque owned only 940 sheep and 1,025 goats (Report of the Commissioner for Indian Affairs [RCIA] 1867:203). In 1868, the Navajo were allowed to return home. To help them recover economically, Article 12 of the Treaty of 1868 stipulated that the government would give the Navajo 15,000 sheep and goats. Navajo leaders requested that this distribution include more goats than sheep, a request that clearly indicated the subsistence value of goats. When this issue was first raised, General Getty told them that he thought they could have about half the stock in goats and half in sheep (Bennett 1869). However, other government officials appear to have ignored their request, and in November of 1869, 14,000 sheep and only 1,000 goats were distributed (Bailey and Bailey 1982:97–99, 1986:38).

During the 1870s, the number of sheep and goats increased rapidly, until by the 1880s their herds numbered over 1,000,000 animals. Official estimates of Navajo livestock during the 1870s lumped sheep and goats together, sometimes as “sheep.” During the 1880s, rounded estimates were frequently given separately for sheep and goats. Between 1881 and 1890, yearly estimates on the number of sheep ranged between 700,000 and 1,000,000+, while the yearly estimates for goats ranged from 200,000 to 300,000 (Bailey and Bailey 1986:299–300). These figures indicate a goat to sheep ratio of between 1:3 and 1:4.

In total numbers, the goat and sheep herds of the late 1870s and 1880s surpassed those of the pre-1863 period. Herding became increasingly important, as farming and wild-game resources decline. Trading posts were opening on and off reservation, but Navajo herding remained subsistence oriented. Although the Navajo purchased more flour and canned goods from the trading posts, these foods constituted a very minor part of their total diet. During the 1880s, there was a decline in the market for Navajo blankets, largely because of the competition from commercially manufactured Anglo-American trade blankets. The new major items of the Navajo trade were by-products of their normal subsistence activities: wool and pelts of butchered stock. Wool was now traded rather than woven into blankets for trade. In the 1880s, the Navajo were selling about 1,000,000 pounds of wool per year, usually for about 6¢ to 10¢ per pound. There was also a good market for pelts and skins. In the late 1880s, between 240,000 and 300,000 sheep
pelts and between 80,000 and 100,000 goat skins were annually sold. Sheep pelts brought about 10¢, while prices for goat skins ranged from 15¢ to 50¢ each (Bailey and Bailey 1982:128). Assuming that the pelts were those of animals butchered for home consumption and that most were sold, the ratio of goats to sheep butchered would be 1:3, or proportionately a slightly higher number of goats butchered than in the herds.

The 1880s and early 1890s were a time of unprecedented prosperity for the Navajo. With herd size far greater than at any other time in Navajo history, in 1892 Agent David Shipley reported that “...with the exception of Osage, the Navajos are the wealthiest tribe in the United States” (RCIA 1892:576). This prosperity was not to last. In the mid-1890s, the Navajo economy collapsed. Drought and increasing range competition with Anglo-American and Spanish American ranchers led to severe overgrazing and a dramatic decline in herd size (Bailey and Bailey 1986:100–104). From well over 1,000,000 animals in the early 1890s, the number of sheep and goats dropped to only about 400,000 by 1900 (Bailey and Bailey 1986:300).

During the early decades of the twentieth century, Navajo herds recovered. However, the focus of the Navajo herding economy had changed. The Navajo herding economy that emerged was oriented toward increased production for commercial trade. In this new economy, sheep played a far more important role, since sheep supplied the Navajo with their three major trade items: wool, rugs, and lambs. The change took place in two stages: (1) lasting up until World War I, was the rug stage; (2) the marketing of lambs, begun after World War I.

During the depression of the 1890s, Anglo traders sought markets for Navajo goods. One important market that they established was for Navajo rugs; heavier versions of the traditional blanket. Henceforth, the Navajo had two alternative ways to market their wool. They could sell their wool as raw wool or spin and weave it into rugs. At the turn of the century, wool was bringing only 13¢ to 15¢ per pound in New York (U.S. Bureau of the Census 1975:517–518), and the Navajo received much less, usually only a few cents per pound. However, if this same pound of wool was woven into a rug, they could sell it for an average of $1.00 per pound Report of the Governor of New Mexico (RGNM 1903:173). Rugs were commonly bought and sold by the pound during this period, thus the term "pound rug."

With their herds small, the Navajo and the traders turned to rugs as a means to end the economic depression. In 1899, the Navajo marketed an estimated $50,000 in rugs (RCIA 1899:157). By 1914, Navajo rug production peaked, when an estimated $700,000 in rugs were sold (RCIA 1914:34). By this time, the herds had recovered to their former size, and the outbreak of World War I had increased the prices for both wool and sheep.

World War I signaled another change in the Navajo herding economy. A major national market had developed for lambs. In the late teens and early twenties, the traders began for the first time to buy Navajo lambs. By the 1920s, the Navajo had become commercially oriented sheep ranchers, marketing wool in the spring and lambs in the fall. Weaving declined in overall economic importance, but still remained an important alternative way of marketing wool, particularly for families with small herds (Bailey and Bailey 1986:124–164).
The commercialization of sheep raising, while diminishing the importance of goats in the overall economy, served to increase the subsistence value of goats. Since only sheep had commercial value, goats were butchered to preserve sheep (Bailey and Bailey 1982:342–343).

There were also attempts to commercialize goat raising. About the turn of the century, some Navajo families began raising Angora goats, and by the 1920s, Angoras were common in the eastern and southern portions of the reservation. The shift from milk goats to Angora altered the economic value of goats. The advantage of Angora was that they produced mohair, a marketable product. The disadvantage was that Angora, while still efficient meat producers, are not milk producers. Thus, the shift from milk goats to Angora resulted in lowering the subsistence value of goats.

Although only a minority of Navajo families replaced their milk goats with Angora, the increasing numbers of Angora made goats more economically questionable. The interbreeding of milk goats and Angora also resulted in hybrid goats that produced little milk and poor-quality mohair. As mentioned, the sheep herds directly or indirectly produced three marketable items: lambs, wool, and/or rugs. Lamb and wool prices fluctuate on different cyclical patterns. When lamb prices are low, wool prices are frequently high, and vice versa (Horbacher and Hammonds 1945:14; Peters and Deyoe 1946:19). The market prices of both were rarely low in the same year. In addition, if wool prices were low, wool could be woven into rugs and marketed at a higher price per pound. In contrast, Angora goats produced only a single marketable item—mohair. There was no market for kids, and mohair never found favor as a raw material for rugs. The price for mohair was considerably more volatile than that for wool. The primary use for mohair during the early twentieth century was in the making of plush for seats in railway passenger cars and in automobiles. In 1927, the Navajo were selling their mohair for 40¢ per pound (Northern Navajo Narrative Report 1928:9), or about twice the price of wool. However, the Great Depression of 1929 quickly collapsed the market for new automobiles and plush. Brokers soon found themselves with backlogs of unsold mohair, and the price dropped to 10¢, if it could be sold at all (U.S. Congress 1932:9590, 9665). Angora goats competed directly with sheep in economic function, and it was economically less valuable than the sheep.

Livestock reduction targeted goats for special attention, and dramatically reduced their numbers, both in absolute terms as well as proportionately to sheep. As Navajo herds were increasingly commercialized during the 1940s and 1950s, the number of milk goats declined. By the 1960s, Angora goats had virtually replaced milk goats in the Navajo herds.

**SUMMARY**

In studies of the Navajo economy, anthropologists have, for the most part, neglected the role of goats. While not as overtly biased toward goats as government officials, certainly the cultural bias of anthropologists has been one of the factors. However, the major factor has been the lack of understanding of the role of the herd in Navajo economic life and particularly the major changes in the economic role of herds over the past 300 years. From subsistence herders, the Navajo changed to commercial ranching. This shift in focus occurred in a series of distinct stages. As the economic role of the herd changed, so did the relative
economic importance, as well as economic functions of goats and sheep. In subsistence herding, goats were of far greater value than sheep. As herding became increasingly market oriented after 1900, the value of the goat was diminished, until by the 1950s, goats were merely less valuable "sheep." Unfortunately, most anthropological studies of Navajo herding took place after the economic role of goats had already been diminished.

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ASNM 24: Papers in Honor of David M. Brugge
In 1994, we reported on the excavations around a possible Piedra Lumbre Campsite on Ghost Ranch in northern New Mexico (Binggeli et al. 1994). Since that time, four more years of two-week seminar excavations have revealed further levels of habitation. The dating of radiocarbon samples has added to the understanding of this popular campsite. The apparent surface features of this site include a low rock wall with remnants of three wooden posts. Scratched into the cliff face was the name “Nikos Lovato, April 1916.”

LOCATION

The site, named Ghost Ranch-2 (LA 13674), is located in the county of Rio Arriba on the east pasture of Ghost Ranch on the Bull Canyon drainage. The general area has a history of occupations extending from the Archaic period through the Anasazi, Piedra Lumbre or Navajo, and the Spanish and Modern periods (Kemrer 1992; Schaafma 1979). It is found on the northern bank of a floodplain close against a south-facing sandstone scarp and is 3 to 5 m in height. As presently mapped, the site includes an area 12 by 17 m or 204 sq m. Of these, 65 sq m have been excavated to varying depths (Figure 1).

METHODOLOGY

Excavations have been carried out for periods of two weeks a year over the last eight years. The site was first surveyed for surface features and artifacts. The meter squares were then excavated in 10-cm levels, and the soil sifted with 1/4 in. gauge screen. Excavations have proceeded down to 2.5 m below the surface in some areas. All artifacts have been cataloged and stored in the Florence Hawley Ellis Museum of Anthropology at Ghost Ranch. To date, 1,350 artifacts have been collected, cleaned, numbered, and accessioned in the Ghost Ranch Museum of Anthropology. Each has also been entered into a computerized database using the FileMaker Pro program (copyright Claris Corp. 1995), so that artifacts can be listed and found by number, type, description, material, location, size, relation to features, and age, as determined in the laboratory.

COMPUTER MODELING

In order to help manage and to gain additional perspective on the overall site, a three-dimensional computer model has been constructed and is being updated periodically using the WalkThrough Pro 3D visualization
Figure 1. Plan view of excavation grids at GR-2 showing excavated meter squares in shading and the level below datum in centimeters on each square. Also shown is an indication of the surface of a low rock wall, the three slab-lined firehearths, and the cliff face shown in the irregular contour at the top. The outline of the permanent shelter frame is indicated by the dashed lines.
program (copyright Virtus Corp. 1995) (Figure 2). With this program, the site can be
“toured” and “viewed” from a variety of
perspectives, and an overall sense of the
progress of the excavation can be assessed
from the convenience of the laboratory. In
addition, artifacts can be placed in three-
dimensional space and rotated to look for
areas of concentrations or usage. The model
can also be used as an interpretive aid to meet
a variety of educational or consultation needs.

DATING

Samples have been collected for pottery
analysis, dendrochronology, radiocarbon
dating, obsidian-hydration dating, and flotation
analysis. All these will be used to construct a
stratigraphy of chronological and usage
patterns. Only a few of the radiocarbon,
obsidian-hydration, and dendrochronology
samples have been run to date the hearths.

STONE OR ARCHITECTURAL
FEATURES

Stone and Wood Surface Structure

The low rock wall and posts suggests a
recent historical use as an animal pen or crude
ramada or dwelling. In addition to the surface
walled structure, other architectural features
were discovered. Inside the wall, two levels of
fragmented flagstone floors were uncovered at
10 and 20 cm below the surface. The 10-cm
floor is quite level and extends 4 m west from
a large flagstone threshold slab at a break in
the surface rock wall. The slightly deeper, -20
cm floor is thicker and more irregular. A
nearly continuous layer of charcoal is
sandwiched between the two floors. Within
this charcoal layer were found burned and
intact logs or poles, parallel to each other and
perpendicular to the cliff face. Our hypothesis
is that these poles are remnants of the vigas of
a burned and fallen roof, perhaps supported
by the still visible surface poles and shallow
pits in the cliff face. Three of these wooden
items have been dated using dendrochronology
done by the Tree-ring Laboratory at the
University of Arizona. All three of these items
have been dated exactly to the year A.D.
1787. One of the samples was described as a
burned log parallel to the floors, perhaps a
viga. Another was described as a post base,
perpendicular to the floors, perhaps used to
support the roof. The third wood sample was
found at a .5 m greater depth, under a small
rock slab, perhaps as a burned fragment from
a firepit. The visible structure at the site, a
simple roofed and floored shelter or ramada,
was most likely built that year, 1787, and
occupied for an unknown length of time. This
may stretch the outside limits of being a
Piedra Lumbre phase dwelling, which has
been usually confined to the A.D. 1650-1750
period.

Stone-Lined Fire Hearths

Three flagstone-lined fire hearths have been
found at the site so far, each with a different
style of lining and each with burned charcoal
inside giving a different date for the burned
charcoal inside.

The first was found at a depth of 80 cm
below the surface, beneath the dated rock
structure. It is a large, V- shaped, slab-lined
fire hearth with the slabs arranged in a funnel
shape, becoming closer together toward the
bottom and filled with charcoal (Figure 3a). Radiocarbon dating of wood charcoal put the
use of this hearth at 590±50 B.P. or the early
fifteenth century.

In 1995, a small, parallel-sided, square
stone-lined fire hearth was unearthed (.50 by
.61 m outside dimension), about 15–20 cm
below the surface, just to the east of the
Figure 2. A printout from the front of the shelter showing the three-dimensional computer model of the site with the excavated squares in darker gray and the flagstone-lined hearths indicated by the white arrows.
angled hearth (Figure 3b). This contained wood charcoal dated at 930±50 B.P. (Beta 88678) or the mid-eleventh century.

In 1997, a larger, more-rectangular, parallel-sided, stone-lined fire hearth or roasting pit was uncovered at a slightly lower depth than the other two (Figure 3c). It was also completely floored with flagstone and filled with wood charcoal. The charcoal has been radiocarbon analyzed to 1240±50 B.P. and 1030±50 B.P. (Beta 113904 and 113905, respectively).

Three other, smaller, cobble-lined hearths were found throughout the site along the length of the test trench. One hearth 8 m out from the cliff face contained charcoal radiocarbon dated 133 years before present (A.D. 660±60) or the late seventh century. Closer to the cliff face, over 2 m below the surface, a small collection of charcoal was found suggesting a campfire. This was radiocarbon dated at 3980 years B.P. (B.C. 1980±80). It was found in association with a lithic core flake of chert, a large chert hand tool, and chert lithic debitage.

**ARTIFACTS**

Numerous lithics were found throughout the site, both on the surface and within the excavations. Lithic finds include projectile points, longitudinal biface tools and fragments, scrapers, hammerstones, cobbles, fire-cracked rock, manos, metates, drills and gravers, cores, flakes, and assorted debitage. All debitage above the screen size of 1/4 inch is saved, counted by type of rock, and cataloged.

**Projectile Points**

The projectile points were composed primarily of Jemez and Polvadera obsidian points with some Pedernal chert and a few quartzite samples. The maximum size of the projectile points is 4 cm, with most in the range of 1.5 to 2.0 cm. One hundred twenty-three projectile points have been collected; a sample is illustrated in Figure 4. They are being analyzed to establish a loose typology based on age.

**Grinding Platforms**

Many manos and metates have been collected throughout this site. In addition, two more unusual grinding mortars have been excavated, each with a circular depressed grinding pit on its surface (Figure 5). One was found at a depth of 70 cm below the surface, and the other at a depth of 150 cm. The latter was found below a large collapsed rock (4 by 1 by .5 m) broken off the cliff face. This collapsed mass must have altered the configuration of the site, necessitating filling in or working around this large intrusion into the site. This collapse probably happened between 1,000 and 2,000 years before the present, based on dated stratigraphy.

**Other Lithics**

Thirteen representative samples of obsidian lithics were submitted for obsidian-hydration and rind measurements to Christopher Stevenson at the Archeological Service Consultants of the Diffusion Laboratory in Columbus, Ohio (Stevenson 1992). The shallow levels (20-30 cm below surface) of excavation in the rockshelter contained two points from the seventeenth and nineteenth centuries. These correspond well with the pottery sherds found at approximately the same depths. A set of three obsidian lithics from the area of the slab-lined fire hearth, whose bottom is at a depth of about 70 cm below the surface, are clustered in age from the early thirteenth century to the mid-
Figure 3. (a) V-shaped hearth dating to approximately A.D. 1400, (b) Small square hearth dating to approximately A.D. 1060, (c) Rectangular flagstone-floored
Figure 4. A sample of projectile points from site LA 13674.
fourteenth century, providing at least a tentative guess at the age of the fire hearth. Deeper lithics from .5 to 1.0 m below the surface, inside the shelter, contained obsidian points that were culturally shaped to the style of the eighth, ninth, and tenth centuries (dated by Stevenson to A.D. 794, 825, 909). Obsidian samples from depths 1.5 to 2 m below the surface are in analysis at the present time and may correlate with some of the older radiocarbon dates.

Pottery

Pottery sherds were found on the surface within the excavations of LA 13674 (Site GR-2). Most were found in shallower levels between 75 and 150 cm below datum. According to pottery analysis done by Haywood Franklin reported in the previous paper, he concluded from the samples “that there is indeed a time stratification” from the surface to the depths down to 150 cm, that the “sherds are from the general Tewa tradition spanning the historical period,” and even further that they are “derived from the Pajarito Plateau cultures” back at least to the 1400s (Franklin 1991). The pottery typing alone provides us with a layering of historical to early prehistorical cultures to a level of approximately 1.0 m below the surface. The excavations below that level are devoid of pottery and this would be consistent with preceramic time periods that are archaic in date (B.P. 1400–6900, or B.C. 5000–A.D. 600).

SOIL DESCRIPTION AND STRATIGRAPHY

All of the soil around the site to a total depth of 2 to 3 m is probably cultural, according to Dr. Les McFadden of the Department of Earth and Planetary Sciences at
the University of New Mexico. In order to establish a dated stratigraphy, over 50 artifacts have been dated through laboratory techniques or classification. A mathematical correlation was calculated between these estimated laboratory ages and the depth of location for different types of artifacts. The radiocarbon dates on fire hearths and burned logs yields a high depth-age correlation of approximately .90. Obsidian-hydration age-depth correlations were only about .30 at best, meaning either the technique is less accurate or that obsidian artifacts are subject to more shifting with time. Numerous rodent holes on the site could partially explain some of this. By combining all of the dated material in one common sample, the age-depth correlation rises to .50-.60, an intermediate value.

SUMMARY AND INTERPRETATIONS

A south-facing shelter under a cliff overhang has been the site for camping for over 4,000 years, up to the twentieth century. The Nikolas Lovato graffiti of April 1916 may have been the most recent date of use. The surface shelter—with a low rock wall, vertical posts, and suggestions of a horizontal roof—had a likely date of construction of A.D. 1787. A broader use of the site is shown by three flagstone-lined slab hearths used 600 to over 1,000 years ago. The partial collapse of the cliff face happened considerably earlier, and datable charcoal with accompanying artifacts under the collapse was used nearly 4,000 years ago. Various dating methods yield more or less accurate stratigraphy of the overall site. Additional dating and excavations will further clarify the patterns of usage at this popular location.

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When the Athapaskan peoples arrived in the Southwest has been debated for years. Although some anthropologists doubt the entry occurred much before the Pueblo Revolt of 1680, the pre-Revolt occupation proposed by archaeologists based on the Navajo Reservoir salvage project is supported by subsequent archaeological studies in the Navajo Reservoir district and adjacent areas, especially La Plata Valley. Numerous chronometric dates have been compiled for assessing the age of the Dinétah phase, originally estimated at A.D. 1550–1700. Dates as early as A.D. 1250 have been obtained in La Plata Valley, supporting the validity of the pre-Revolt hypothesis and leading some archaeologists to extend the beginning back as early as A.D. 1400–1450. However, detailed analysis of chronometric assays and tree-ring dates using a model of Navajo wood-use behavior and its effects on archaeological dating techniques support the original formulation, suggesting that substantial revisions are unwarranted. Pushing the beginning back further than A.D. 1500 is not justified, although definition of the Dinétah phase as synonymous with the initial entry of ancestral Navajo peoples into the Southwest should be reevaluated.

INTRODUCTION

For many years, anthropologists have debated the timing, route, and effects of Athapaskan entry into the Southwest with little empirical evidence to guide their speculation. Even the historical records are deficient, because Dinétah, the ancestral heartland of Navajo oral traditions, was outside the mainstream of European observation and influence. The effects of Spanish settlement on Navajo groups were indirect, and most historical records were second hand, seldom distinguishing Navajo from Apache. While the Navajo were involved in hostilities that plagued the Southwest during the early period of Spanish rule, there appears to have been little European encroachment on Dinétah until well after the Pueblo Revolt of 1680. Certainly, the historic period did not begin in the Dinétah until after 1700.

Lack of historical data has made early Navajo studies a fertile area for archaeological research. Investigations at La Plata Mine over the past decade have provided data to evaluate the temporal parameters of Athapaskan settlement during the protohistoric and early historic periods. Early Navajo components excavated at 15 sites can be confidently assigned to occupation before 1800 (Brown 1991; Gaudy 1986; Hancock et al. 1988; Reed
et al. 1988; Reed and Horn 1988). How early the earliest of these occupations might be is a matter of debate. Published estimates posit a mid-fifteenth century date (Hancock 1992; Hogan 1989) or earlier (Hancock et al. 1988; Reed et al. 1988; Reed and Horn 1988, 1990). These chronometric data are examined in this paper to assess the beginning of the Dinétah phase in La Plata region.

THE ORIGINAL PROPOSAL

The Dinétah phase was defined on the basis of salvage archaeology in the Navajo Reservoir floodpool and adjacent areas in the upper San Juan River drainage (Dittert 1958; Dittert et al. 1961). Surveys between 1956 and 1959 documented 523 sites and identified over 170 Navajo components that were classified into one of three phases: Dinétah, Gobernador, and Recent Navajo. The Gobernador phase had been previously established as historic in age, but the Dinétah phase was a new idea that provided a model of Navajo origins during the protohistoric period.

The beginning of the Dinétah phase, about 1550–1600, was viewed as the time when the Navajo had just arrived in the Southwest and distinguished themselves from other Athapaskan groups. This model assumed that both Navajo and Apache had descended from a hunter-gatherer adaptation to the High Plains of eastern Colorado (Dittert et al. 1961:247). The Navajo-Apache split was associated with the earliest Athapaskan entry into the Southwest shortly after the Spanish Entrada between 1540 and 1542. Thus, the Dinétah phase was proposed as the earliest Athapaskan occupation of the San Juan Basin; Navajo culture was distinguished from that of the Apache by this new adaptation.

Empirically, a subtractive definition was all that could be presented. Assuming the early complex to be relatively unaffected by Pueblo contacts, traits attributed to Pueblo influence were subtracted: painted and slipped pottery, masonry architecture, and animal husbandry. The hypothesized core of the Dinétah phase included forked-stick hogans, Dinétah Gray pottery, side-notched and corner-notched projectile points, side-notched axes, full-grooved mauls, and a diverse chipped-stone technology (Dittert et al. 1961:246). Corn, beans, and gourds were included on a later list of Dinétah-phase traits (Hester 1962:63). This polythetic approach was innovative in isolating one of the less visible, transitional occupations that logically had to occur in the area, but it was problematical because all traits were also included in the subsequent Gobernador phase.

Excavations gave little support to the hypothesis. In addition to expanding the survey assemblages, possible Dinétah occupations at two rockshelters were bolstered by stratigraphic superposition and geomorphology that documented Dinétah materials in an older, discrete zone underlying Gobernador deposits (Eddy 1966; Hester and Shiner 1963). Additional sites were identified as Dinétah components by the excavators, but these field judgments were questioned in the final synthesis that rejected the Dinétah phase as a recognizable manifestation (Eddy 1966).

BEYOND NAVAJO RESERVOIR

After Navajo Reservoir flooded the upper San Juan River, supporting evidence for the Dinétah phase was slow in coming because of its limited, subtractive definition and chronological problems, especially the difficulty with tree-ring dating of juniper, the most common early Navajo building material. Eddy’s (1966) critical treatment of the Dinétah phase in the Navajo Reservoir district was joined by
Carlson's (1965) skeptical appraisal in the adjacent Gobernador district. Even sympathetic researchers in the Chaco Canyon area were unable to document Navajo occupations predating the Pueblo Revolt (Brugge 1986; Vivian 1960).

The case was weakened further when Schaafsma (1979), who cut his teeth archaeologically at Navajo Reservoir, produced an alternative model of Navajo origins based on the Abiquiu Reservoir project along the Rio Chama to the east of the Continental Divide. The demise of the Dinétah phase appeared imminent when Schaafsma, a discussant at the 1979 conference on the protohistoric period, challenged “...those who would oppose a Plains entry (for Athapaskan groups) at a late date should step forward and clearly place their evidence before the scholarly community” (Schaafsma 1981:296). Outside the Navajo Reservoir district, the strongest argument supporting the Dinétah phase at that time was theoretical, using demographic and ecological retrodictions from historic baseline data (Brugge 1981, 1984).

Finally, contract archaeologists on the Cortez CO₂ pipeline produced enough chronometric evidence to revive the Dinétah phase, at least for continued consideration (Marshall 1985). The evidence included radiocarbon-dated ceramic assemblages from two excavated sites in Blanco Canyon: El Campo Navahu (LA 38946), with a sixteenth-century date, was described as a single-component Dinétah phase site; La Ceja Blanca (LA 38951), with four dates ranging from the sixteenth through eighteenth centuries, was interpreted as multicomponent, with both Dinétah and Gobernador phase occupations.

The most productive research on the Dinétah phase to be published thus far was done by a variety of investigators at La Plata Mine over the past decade. Intensive survey and testing resulted in a cultural-resource inventory of 338 sites with early Navajo components identified in 44 instances (San Juan Coal Company 1990). Eighty percent of the early Navajo components are assigned to the Dinétah phase. The situation is opposite that at Navajo Reservoir, where possible Dinétah sites were obscured by a heavy concentration of Gobernador remains. Instead, La Plata sites are characterized by an extreme rarity of Gobernador Polychrome and other late diagnostics, though several later sites with these materials are documented in adjacent portions of Colorado (Karlson and Biggs 1985; Leidy 1976).

Chronometric dating has been successful at most La Plata sites. The first results, produced by the Division of Conservation Archaeology (DCA), included radiocarbon dates from various protohistoric components, along with obsidian-hydration and thermoluminescence (TL) dates (Hancock et al. 1988; Reed et al. 1988). Additional radiocarbon dates were obtained from one site excavated by Nickens and Associates (Reed and Horn 1988), while another radiocarbon date was secured by the Bureau of Land Management (BLM) from a small camp with a few Dinétah sherds (Gaudy 1986). Mariah Associates provided numerous additional radiocarbon dates, along with obsidian-hydration and the only protohistoric tree-ring dates from La Plata region (Brown 1991).

The chronometric assays are provocative. The small site investigated by BLM provided one of the earliest ¹⁴C dates: 600±40 B.P.: cal A.D. 1285–1408 (DIC-3334).¹ Comparable dates were generated by DCA, with the mean on the majority ranging between 570 and 210 B.P. (cal A.D. 1332–1659). DCA got direct TL dates on 27 Dinétah sherds from five protohistoric sites; mean dates range from

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470 to 250 B.P. (A.D. 1480-1700), with one very early outlier having a large standard deviation (610±122 B.P.). The dates are comparable to raw \(^{14}\)C dates from the same sites but substantially later than \(^{14}\)C dates that were tree-ring corrected (Reed et al. 1988:356). Thirty obsidian artifacts from protohistoric contexts also were dated; mean dates range from 643 to 333 B.P. (A.D. 1307-1617), comparing favorably with corrected \(^{14}\)C dates, but on the whole they are statistically earlier than TL dates from the same sites (Reed et al. 1988:356).

One site tested by DCA was investigated further by Nickens and Associates (Reed and Horn 1988). The structure at this site (LA 49498), known as Kin 'Atsá, produced a homogeneous suite of radiocarbon dates. Combined with DCA dates from the same structure, the dwelling has five \(^{14}\)C dates with means ranging from 490 to 370 B.P. (cal A.D. range 1300-1642). A sixth \(^{14}\)C date in this range is associated with an outdoor hearth. Reed and Horn (1988:80) narrowed the range by averaging all six dates, arguing they were all contemporaneous; this procedure resulted in a (calibrated) mean of A.D. 1444, with an age range of A.D. 1437-1466, which they interpreted as evidence for a mid-fifteenth century occupation.

While DCA merely suggested the need to push the beginning date for the Dinétah phase back into the fifteenth century, Reed and Horn (1990) were unequivocal in claiming to have documented a Navajo component, at least one century older than the start of the Dinétah phase, as hypothesized by Dittert (1958; Dittert et al. 1961). I shall return to Kin 'Atsá later, suggesting that it is, in fact, a late Dinétah phase occupation, probably no earlier than A.D. 1600. Nevertheless, Reed and Horn were not alone in their initial reaction to early dates from these protohistoric sites. Most archaeologists hurried to reestablish the Dinétah phase and push back its origins before the European discovery of the New World (Hancock 1992; Hogan 1989; Reed and Horn 1990; Winter and Hogan 1992).

By 1988, when Mariah Associates began excavations at La Plata Mine, considerable data had been accumulated and most had been reported. This advantage made it possible to implement a refined research strategy that identified the absolute age and ethnicity of protohistoric sites as specific issues to be addressed (Brown 1991). The 1988-1989 excavations not only expanded the chronometric database but also produced dates that were generated precisely for refining the parameters of early Navajo occupation. This project was the first to recover datable tree-ring specimens from a protohistoric site in La Plata region. This site and three others provided a suite of 23 radiocarbon dates associated with Dinétah assemblages; the means range from 800 to 190 B.P. (cal A.D. 1039-1807).

At face value, the array provided by chronometric analyses of La Plata sites is both exciting and confusing. Exception for the tree-ring dates, the rate of error associated with these techniques, is not well established. In addition, there are significant interpretive obstacles to applying even the most exact dates to cultural processes and events that are of interest. These aspects of archaeological dating must be considered before returning to La Plata results.

SOME METHODOLOGICAL CONSIDERATIONS

Although archaeologists commonly study extinct cultural systems, they too often ignore gaps between behavioral processes that generate archaeological deposits and the
physical remains available for study after a site has been abandoned for a number of years. Schiffer (1972, 1976) addressed this problem by distinguishing the archaeological context of cultural materials from what he called systemic context (i.e., dynamic behavior that produced the remains). Dating provides a classic example: radiocarbon assays determine the time that organic material was generated, most commonly plant tissue formed during the life of a tree. Growth occurs long before human beings gather wood for use as fuel or construction material. Schiffer (1986, 1987) calls this the old-wood problem and notes that, especially in arid environments, dead wood preserved on the ground is usable centuries after the death of a tree. Dates provided by dendrochronology, therefore, can be much older than cultural activities, such as building a fire or hogan.

Radiocarbon dates on wood can be even older because the inner rings of the trunk can be several centuries older than outer rings produced just prior to death. Smiley (1985) calls this additional problem the “cross-section effect” and notes that it too is acute in arid environments where tree growth is slow and intermittent and tree rings accordingly are thin and dense. The tendency for inner wood to be preserved and most likely used for either radiocarbon dating or dendrochronology must be taken into account along with the old-wood problem. Such dates must be used to infer when people occupied archaeological sites.

Such problems are not limited to radiocarbon and tree-ring dating. Dean (1978) urges archaeologists to be explicit in applying dating techniques and distinguish between “dated events” and “target events.” The latter are most interesting to archaeologists, generally being equivalent to the systemic context. General rules can be used to link the events dated through various techniques and the target events of archaeological interest. Dean shows how some rules are best applied using information on systemic context such as wood-use practices. His study of Navajo wood-use behavior illustrates situational and idiosyncratic factors that influence the results obtained through archaeological dating (Dean 1981). These factors tend to produce patterned results that, to some extent, can be controlled in archaeological applications.

While systemic factors are hard to control, failing to take them into account leads to overestimating the age of cultural target events. The frequent association of ancient tree-ring dates from forked-stick hogans with Gobernador Polychrome and even historic artifacts illustrates the magnitude of the old-wood problem at early Navajo sites. Cross-section effect is less obvious, but countless tree-ring studies show the disparity in 14C dates that would be obtained from different portions of a log. Finally, wood reuse may be most common in sedentary cultural systems, but it occurs opportunistically among other groups, too. An outstanding example is a tree-ring specimen with inner wood nearly 1,400 years old that was obtained from a Navajo corral built less than a quarter century before the specimen was collected (Smiley 1985:28). Considering that a 14C date based on charcoal might be affected by all of these factors, the need to integrate basic interpretive principles into chronometric analyses should be obvious.

AN INTERPRETIVE MODEL FOR PROTOHISTORIC RADIOCARBON DATES

Although archaeological principles to adequately control such extraneous variables as old wood, cross-section effect, and wood reuse are poorly developed at this time, I incorporated these factors in La Plata chronometric analysis. Because my primary
focus is on $^{14}$C dates, wood-use behavior and wood preservation are critical elements of the dating model proposed below. The model was developed using methodology expounded by Schiffer (1987) and principles relevant to early Navajo sites, based on the work of Dean (1981) and Smiley (1985).

Excavated architectural features at La Plata Mine consist of brush structures and forked-stick hogans, the latter built in shallow, excavated depressions, sometimes hexagonal in plan (Brown 1991; Brown and Hancock 1992). The most common characteristic of these features is their burned condition (Figure 1), unlike Gobernador structures of the Navajo Reservoir district and other areas where collapsed but intact forked-stick hogans are abundant. Some well-preserved hogan features at La Plata Mine show that as many as six major logs formed the main support structure, and numerous smaller logs were leaned against the forked-stick framework. Juniper seeds in roof fall suggest that green branches were placed over the conical superstructure; juniper bark was also identified in some forked-stick hogans. Rocks were occasionally placed around the perimeter and sometimes over the structure, perhaps to hold down the closing material.Copious amounts of earth then covered the hogan superstructures.

From an archaeological perspective, quantities of charcoal, some burned seeds, and occasionally bark are available for dating. The latter, especially seeds, were eagerly sought during Mariah’s excavations, since their use of radiocarbon dating circumvents the old-wood problem and cross-section effect. Flotation analyses show juniper to be the most common construction material and fuel wood, augmented by piñon and occasionally other materials. The implication of widespread reliance on juniper is significant for evaluating radiocarbon dates. (1) Juniper is remarkably well adapted to Southwestern deserts. Its tolerance for drought creates erratic tree-ring patterns that make this wood hard for dendrochronologists to date. (2) Thin tree rings exacerbate the cross-section effect by compressing many years into a small piece of wood. (3) Juniper trees live a long time, and the inner wood may be several centuries old at the time of the tree’s death. (4) Finally, juniper is well preserved in arid areas, standing long after death, thus, avoiding moist ground conditions fostering wood decay (see Schiffer 1987:165–177).

In sum, it should not be surprising if wood in early Navajo hearths and hogans was hundreds of years old at the time of occupation. Unlike vigas used for pueblo roof construction, the main superstructure in forked-stick hogans was frequently built from dead trees that provided sizable logs having hundreds of tree rings. While smaller logs in a forked-stick hogan might be younger, perhaps averaging 100 years, the main posts probably would be at least 200 years old. The leaners comprise greater mass in a typical hogan, but they would be most apt to burn up completely, along with the outer portions of all logs.

Smiley (1985) used tree-ring data and computer models to find that cross-section effects on juniper and piñon logs is about 30 percent, based on volume. Thus, if a 200-year-old log is completely charred, a random collection of charcoal for radiocarbon dating would be 30 percent older than the outermost ring. In this example, the $^{14}$C date would be 60 years before the tree’s death. An average cross-section effect of 45 years is probably conservative, given the intense blaze that seems to have destroyed most La Plata hogans. Elimination of this factor necessitates identification of outer rings. This was possible
in a few cases (Brown 1991; Hancock et al. 1988).

The old-wood problem is more difficult to assess. Its effects are also more random because of the variable ages of dead logs available in any given place. Tree-ring analyses demonstrate this by showing a spread in the dates instead of a cluster, which could be interpreted as a construction date (Dean 1981).

In terms of preservation, Schiffer (1987:166, Table 7.1) puts juniper into the category of resistant/very resistant. The good condition of unburned Gobernador-phase hogans at open sites in northwestern New Mexico indicates that very old logs could be used; those in many unburned hogans are still adequate for construction two to three centuries after site abandonment. Observations in chained woodland areas suggest that several decades would be minimally desirable for trees to age to a condition where they could be used as forked sticks without extensive trimming. Based on detailed tree-ring studies and ethnographic data, Dean (1981) shows that hogans on Black Mesa make extensive use of dead wood, while wood reuse is less common and less consequential to
chronological analyses (see also Kemrer 1974; Smiley 1985). Where dead wood was abundant, it seems likely that trees that died over a century ago would be optimal for hogan construction. Tree-ring dating of Gobernador-phase and historic hogans tends to support this assumption.

Considering a cross-section effect averaging 45 years and dead wood of a century or more old, I have adopted a rather arbitrary 150-200 year lag as a common gap between the dated event (radiocarbon date) and the target event (hogan construction) for protohistoric hogans. The problem is probably less severe in hearths that would commonly utilize smaller branches, especially inside structures. I do not advocate blindly employing this figure as a “correction factor,” but as a reasonable guideline for interpreting broad trends in radiocarbon data and evaluating disparities between multiple dates from a single component. As an alternative to simply discarding “anomalous” dates, or assuming correspondence between \(^{14}C\) dates and the age of occupations, such an approach is warranted.

**CHRONOMETRIC ANALYSIS OF LA PLATA SITES**

In attempting to assess the age of the Dinétah phase, I employed two main approaches. The first utilized the full radiocarbon database available from La Plata Mine—46 protohistoric \(^{14}C\) dates from 13 sites, along with earlier dates for comparison. Data were pooled to discern broad patterns in the \(^{14}C\) dates. The second approach focused on particular components and dates indicated by the first procedure to be candidates for “early” Dinétah phase occupations (i.e., earlier than A.D. 1550). The philosophy here was that, if there were early occupations, we should be able to scrutinize the data from individual sites and identify examples. A convincing argument for phase units and age ranges should require type sites and instances supporting the argument, rather than simply a generalized analysis of pooled data.

Analyzing pooled dates was a tedious task. Individual \(^{14}C\) dates were first calibrated. The University of Washington (1987) CALIB computer program was used to normalize the data and plot probability distributions for each date range. Unlike uncorrected dates, calibrated age ranges do not have a normal distribution with a clearly defined central tendency (mean) and standard deviation. Instead, the probability distributions are generally multimodal and skewed, illustrating “…the kinked and distorted time surfaces of the chronometric scales” (Clarke 1973:10). Individual plots drawn by the computer were superimposed on a single timeline for comparison. The area under the curve of the normalized probability distribution was then summed in 20-year increments to produce graphs for three separate categories of dates: Athapaskan, Anasazi, and preceramic. While the first category is germane to this paper, the Anasazi graph was of interest because it demonstrated a general lag of 100–200 years where dating peaks could be correlated with distinct ceramic periods. For Athapaskan sites, a well-defined probability peak was shown between A.D. 1260 and 1680 (Figure 2). At face value, this sounds like the Dinétah phase, but the beginning is much earlier than might be suspected.

The second stage in the analysis entailed a search for particular sites that would aid in refining the age span for the Dinétah phase. Based on the model presented above, only dates 150 years older than the A.D. 1550 target event provide convincing evidence that behavior occurred prior to that time. Consequently, I went back to the original date...
Figure 2. Normalized probability distribution after pooling of 46 calibrated radiocarbon dates associated with Dinétah phase components at La Plata Mine.

plots and identified all $^{14}$C dates with a major probability during the fourteenth century or earlier. Eighteen of the 46 protohistoric dates (39 percent) fall in this range. Interestingly, they form a distinct mode in the early end of the probability graph. If they are more than just sampling errors, I would expect these cases to cluster at particular sites and be supported by other lines of evidence.

Eight sites produced one or more early date, but some are readily attributed to sampling error. Two sites excavated by DCA, LA 38536 (Hancock et al. 1988) and LA 56841 (Reed et al. 1988), fall into this category, with each site having disparate dates obtained from a single hearth. At the latter site, the early date came from upper fill in the hearth, while the lower fill gave a much younger date. Given old-wood concerns, it seems prudent to accept the younger dates as relevant to human occupation. Another DCA site, LA 56843 (Reed et al. 1988), has three early dates from an open camp; a fourth date (cal A.D. 1330–1624) in this part of the site was not classified as “early” but supports a relatively early Dinétah assignment. Two protohistoric structures elsewhere at the site have younger dates, suggesting an early Dinétah open-air camp with a later, more
permanent occupation. The four dates on the open-air camp are statistically contemporaneous and can be averaged to provide a single date of 504±26 B.P.: cal A.D. 1332–1440 with a 93 percent probability in the A.D. 1394–1440 range. This early component is regarded as a strong case for an early Dinétah occupation, but, in terms of the wood-use model discussed here, occupation during the sixteenth-century is most likely. Several TL dates on Dinétah Gray pottery support a sixteenth-century age for the open-air area.

The open camp documented by BLM, LA 56844 (Gaudy 1986), is a fourth candidate for the early Dinétah phase. A single feature and one date exhaust the potential of this site, however. As noted earlier in this paper, the date is early and supports the inference of occupation during the sixteenth century or perhaps earlier. With only a single date, however, this site is a weak case.

Kin 'Atsá, touted as an example of early Dinétah occupation by Reed and Horn (1990), did not produce any dates judged “early” in terms of standards proposed here. Although there are six protohistoric dates from the site, most are redundant. Reed and Horn (1988) provide three dates from general fill in the structure and one from an extramural hearth, while Hancock et al. (1988) report two dates from what they regard as outer rings from two different charred logs in the structure. While Reed and Horn averaged all of the dates, it seems more appropriate to average only the two “cutting dates” provided by DCA, since only they control for at least cross-section effect. Both dates are the same, providing a mean of 420±42.4 B.P.: cal A.D. 1413–1627 with an 88 percent probability in the 1413–1524 range. Assuming the use of dead wood in building the structure, construction during the sixteenth century or possibly later is indicated.

Reed and Horn (1990:288–289) questioned the validity of DCA’s TL dates from Kin 'Atsá because of the low-firing technology typical of Dinétah Gray, but this would produce obviously anomalous dates if it had any effect (Robert C. Dunnell, personal communication 1991). Thus, rejecting two statistically contemporaneous TL dates (A.D. 1650±60 and 1680±20) in favor of six earlier wood charcoal dates is not warranted. The most parsimonious interpretation is that the 14C dates overestimate the true age of the site, even more than suggested by the wood-use model; the occupation may be as late as the seventeenth century.

Early Dinétah phase dates were obtained at four sites excavated by Mariah Associates (Brown 1991). A hogan at one site, LA 61828, yielded two dates in the 1222–1437 range with no contradictory evidence. One date is on scattered charcoal, while the other is on the outer rings of a charred pole, but it is only 20 years younger. Relatively early construction appears likely, but, assuming the use of dead wood, occupation as late as the sixteenth century cannot be ruled out. A weak case can be made for occupation during the fifteenth century or even earlier.

Another site, LA 61838, is of special interest because two early dates can be compared with later dates, including tree-ring dates. Both early dates are from cooking features in an outdoor activity area and fall in the 1285–1463 range with no contradictory evidence. One date is on scattered charcoal, while the other is on the outer rings of a charred pole, but it is only 20 years younger. Relatively early construction appears likely, but, assuming the use of dead wood, occupation as late as the sixteenth century cannot be ruled out. A weak case can be made for occupation during the fifteenth century or even earlier.
were identified as piñon. Because inside dates were obtained on the tree-ring samples (1391 and 1322p, respectively), the cross-section effect can be evaluated. With pith present on the latter sample, clearly a minimum of 142 years is represented; the vv outer date indicates much more than this, suggesting that a 45-year cross-section factor in this case is not enough. Comparing tree-ring dates with the \(^{14}\)C date from this feature (1303-1463) also suggests that a significant cross-section effect is operative.

A partially burned forked-stick hogan at this site produced both tree-ring and \(^{14}\)C dates, although the latter were not classified as early. The \(^{14}\)C dates are both on outer rings from charred poles, one piñon and one juniper. The two are very similar with a combined range of 1399-1642 and an average of 1415-1629. The same piñon specimen that provided a \(^{14}\)C date also produced a tree-ring date: 1560vv. Another date of 1490vv was determined from a juniper specimen. The \(^{14}\)C and tree-ring dates complement each other. However, if it had not been possible to control cross-section effect in this case by collecting outer wood, this factor would evidently have been great. Both tree-ring specimens lack pith rings and true outer rings, yet the piñon specimen documents 164 years and the juniper, 174 years.

Predictably, this occupation is overestimated by \(^{14}\)C dates, despite the control for cross-section effects. Even tree-ring dates overestimate the occupation, since sapwood is lacking on all four specimens, and the hogan, at least, probably could not have been built before 1600, even if live trees were cut. Given probable dead-wood use, construction of the hogan most likely occurred during the early to mid-seventeenth century, at the youngest extreme of the youngest \(^{14}\)C date ranges. The activity area at this site might be earlier, but occupation still must have occurred well after the youngest tree-ring date, probably no earlier than the early sixteenth century. Again, however, this is much later than associated \(^{14}\)C dates suggest, occurring at the youngest extreme of the youngest date. Thus, Site LA 61838 is rejected as a good case for the “early” Dinétah phase.

A third site, LA 61848, produced two “early” dates, 1039-1284 (86 percent probability in the 1150-1284 range) and 1278-1417, which only barely overlap. The earliest date is associated with a post in a burned brush structure, while the other sample was obtained from a hearth just outside. Scattered charcoal in the burned structure dated later, 1642-1955 (84 percent probability in the 1642-1886 range). While the earlier dates appear susceptible to both old-wood and cross-section effects, the scattered charcoal in this case is probably most reliable, since the mass of Navajo brush structures is comprised largely of younger woody materials less complicated by old-wood use and reuse (Dean 1981). I am inclined to attribute the early dates to old-wood and cross-section effects and employ the late date to infer a late seventeenth-century or possibly even eighteenth-century occupation.

The last candidate for the early Dinétah phase is a strong case. Six out of 12 \(^{14}\)C dates from LA 61852 fall in the 1218-1486 range. Even the latest of the dates has a 93 percent probability of being older than 1625, and no evidence at all contradicts an early assignment. Several of the “later” dates are on juniper seeds and bark, not affected by dead-wood or cross-section effects, supporting both the model of lag time and the inferred early status of this site. However, seeds and bark in all three hogans produced dates encompassing the early 1600s, suggesting that post-1550
occupation cannot be ruled out, despite the number of wood dates in the “early” range. The earliest date that I can offer is provided by charred seeds from Structure 1, 1415–1634, with 76 percent probability of being older than 1530. Wood dates could be used to argue for an occupation at the early end of this time span, but even an outer-ring date (1280–1417) overlaps the date on juniper seeds.

In conclusion, this well-dated site provides evidence that forked-stick hogans were built in La Plata region at least as early as the sixteenth century, and possibly earlier. Most conclusively, however, comparisons between charred seeds and outer wood indicate the old-wood problem in protohistoric hogans might commonly be on the order of 100–150 years. Cross-section effects exceeding 45 years on both pinon and juniper also are common. The analysis demonstrates that these factors need to be reckoned with, since combined they can produce dates that overestimate the age of protohistoric occupations by 200 years and more.

Although some attempts to push the Dinétah phase back to the fifteenth century are advertised as conservative, I would argue that they, in fact, employ liberal interpretations of chronometric data. Still, the fact that the Dinétah phase appears well established by A.D. 1500, complete with formalized forked-stick hogans and a distinctive ceramic assemblage, indicates the antecedents of this complex and other aspects of protohistoric occupation remain a fruitful arena for continued research.

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—Western Cultural Resource Management, Inc., Placitas, New Mexico

ENDNOTES

1 Radiocarbon dates were corrected using tree-ring calibrations published by Stuiver and Pearson (1986), so that 14C dates can be compared with dendrochronological, TL, obsidian-hydration, and other calendar dates (e.g., historic events). The computer program, CALIB, developed by the Quaternary Isotope Lab at the University of Washington (1987) was employed in all calibrations, probability plots, and averaging. Calibrated dates are rendered in years A.D. with the “cal” prefix, while 14C dates with the suffix “B.P.” are uncorrected determinations as reported by radiocarbon laboratories. 14C ranges were calculated with two standard deviations and expressed as two-sigma values.

2 The model developed for chronometric analysis of the Dinétah phase is explicitly designed for dating protohistoric features. Since it was first presented (Brown 1990), several individuals have brought to my attention ethnographic instances of hogan construction using green wood and archaeological features dating to the historic period that incorporated ax-cut logs that would have been difficult to fell if they were long-dead trees. Critics have not summoned evidence for these practices predating the introduction of metal axes, which appear to have been highly valued, nor has the
inclusion of stone axes on the original Dinéhah phase trait list (Dittert et al. 1961) been supported by subsequent research. Direct evidence of hogan construction using dead-standing trees and description of procurement without axes have also been produced (Brown et al. 1992), since the model provided here was originally presented.

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NAVAJO HERO TWIN CEREMONIAL ART IN DINÉTAH

James M. Copeland

The Hero Twins, Naayée’ Neizghání and Tóbájíshchíní, are prominent individuals in traditional Navajo history. Ceremonial art painted and carved on the canyon walls of Dinétah are rich with Hero Twin symbols, such as bow and hair-knot images. Hero Twin imagery in Dinétah is now known to include portraits, or representation in human form. This manner of depicting the Twins in Dinétah ceremonial art is described here for the first time.

INTRODUCTION

Dinétah is the Navajo name for part of the traditional homeland, and the word may be translated as among the Diné. Located in northwestern New Mexico, it is a place of great importance in the history and ceremonial tradition of the Navajo. Archaeological research has established that Dinétah was occupied by what are assumed to be Navajo at least as early as the 1500s and possibly earlier. Significant settlement terminated in the mid- to late 1700s, as Dinétah Navajo moved farther into the San Juan Basin and elsewhere. Archaeological evidence and oral tradition indicate that, after the exodus, some use of Dinétah continued (Robinson and Towner 1993; Van Valkenburgh 1941:161).

The continued use of Dinétah was probably encouraged, at least in part, by the proliferation of painted and carved ceremonial art that was left there. As permanent representations of sacred individuals, plants, animals, and objects, these sites convey to traditionally minded Navajo, even today, a sense of power and respectfulness. Nowhere else in the Navajo world can one find comparable numbers of sites depicting Navajo sacred images. In a sense, the images may be one of the defining characteristics of Dinétah. When one considers the name Dinétah and asks “who were among the Diné?,” perhaps all one needs to do is look on the walls of the canyons and see for themselves. Two of those who were obviously among the Diné at that time are the Hero Twins, Naayée’ Neizghání (Monster Slayer) and Tóbájíshchíní (Born-for-Water).

WHO ARE THE HERO TWINS?

The Hero Twins are the sons of Changing Woman and the Sun and are endowed with the power of both parents (Reichard 1950:76). Monster Slayer is the older, the more impulsive and aggressive, the more masculine. Born-for-Water is the younger, more spiritual, more reserve, cautious, and prone to thoughtful preparation—the more feminine. They are Holy People (Diné Diyíní). They
occupy a prominent position in the hierarchy of Navajo supernaturals. Reichard (1950:56) suggests they may be in a class all by themselves. Of the two, Monster Slayer is the one most often referred to in the songs and stories (Matthews 1902). Father Berard Haile (1938:23 has noted, “every chant seems to feel the necessity of Monster Slayer’s assistance as shown by the introduction into the chant of at least one of his songs.” As a pair, Monster Slayer and Born-for-Water are the type heroes for all other stories, set the patterns for others in facing challenges and hardships, and are a personification of all conceivable power (Reichard 1950).

Their exploits are legendary: on equal status with any heros that western civilization can produce. Perhaps best known are the stories of their birth, their growing up, their journey to see their father the Sun, and their role in the destruction of the monsters and other threats to mankind. Through the conquest of the monsters and dangers, memorialized in Monster Way, their war powers became strengthened. The stories of their birth, youth, and exploits against the monsters are well described by Matthews (1897) and others. Less well known are their other exploits, most of which occur after killing the monsters. Some events indicate a prebirth phase to their existence, where they stand for saviors and teachers as well as the Slayers of Monsters (Haile 1949:129).

Some the adventures of the Hero Twins include Monster Slayer becoming chief of the earth after the separation of the sexes (Reichard 1950:76) and destroying the House Dwellers (Upward Moving and Emergence Way [Haile 1981:217-219]). In the Nightway, Monster Slayer is part of the Chief Gods who send Gháá Ask’idií to capture The Prophet (Matthews 1902:164), and it is Monster Slayer who is the master-of-ceremony and directs all others in the medicine lodge at Tsegi Canyon (Matthews 1902:201). Perhaps in one of the more unusual events, Monster Slayer reveals to The Prophet a pile of 12 human skulls and then dispenses medicine used against enemies (Matthews 1902:202). In the story of the Stricken Twins, Monster Slayer and Born-for-Water aid the twins (Matthews 1897:242; Reichard 1950:450). In Enemy Way, Monster Slayer leads the Taos War (Reichard 1950:154) and is reported to have been the first patient of Enemy Way (Haile 1938:19). After killing the monsters, Monster Slayer is made the commander of the earth (Klah 1942:107). During their second trip to the Sun, the Sun convinces the brothers to aid him in destroying the 'Anaasazí and Navajo (Haile 1981:217-219; Wyman 1970a:59, n63). The Hero Twins helped to persuade Changing Woman to go and live in the west, and afterwards, they returned to teach ceremonies to the Navajo (Klah 1942:114). Eventually, the Twins go to (water flows in a circle), near the confluence of the Pine and San Juan Rivers.

CONTEMPORARY PORTRAYALS

Contemporary portrayals of the Twins include masked impersonators, sand-painting images, and symbolic designs. Each in its own way contributes to the identification of Twin imagery in Dinétah.

Detailed descriptions of the masked impersonators of the Hero Twins in ritual performances have been well presented by Matthews (1897, 1902) and Haile (1947), and are briefly summarized here. Monster Slayer is outfitted with a black mask decorated with zigzag lightning. Haile (1947:23) reports that a white bow is painted on the left cheek. A turkey feather with a downy eagle feather is attached to the top of the mask. The body is painted black. The hands are white, and eight
white bows are painted on the body. A number of necklaces of shell, turquoise, and coral hang from the neck. He wears a kilt or loin cloth, usually scarlet (bayeta), and a belt and moccasins, usually of black buckskin. He carries a black stone knife (Franciscan Fathers 1910:391) in his right hand.

Born-for-Water is outfitted with a red mask. The front of the mask is distinguished by an inverted black triangle outlined in white, and the triangle is large enough to enclose the eyes and mouth. The mask is decorated with white hair knots. The entire body is painted red and decorated with eight white hair knots. The hands are white. The kilt, belt, necklaces, and moccasins are the same as Monster Slayer. Born-for-Water holds in his right hand a black cylinder of piñon and in his left hand a red cylinder of juniper, said by Matthews (1897:233, n115) to represent thunderbolts. He may also carry a blue stone knife (Franciscan Fathers 1910:391).

In 1897, Washington Matthews (1897:253, n269) reported that “A dry painting of this god [Monster Slayer] has never been seen by the author, and he has been told that none is ever made.” He made the same observation for Born-for-Water. It is now clear that Matthews’ sources either misunderstood his questions, or he misunderstood their answers.

Sand-painting portraits of the Hero Twins may appear in a number of ceremonies, such as Shootingway, Nightway, Blessingway, Hail Chant, Upward Reaching Way, War Propylactic Rite, and Big Starway. Hero Twin portrayals in sand paintings seem especially common in the repertoire of the Shootingway Chant paintings. A complete count of the different sand paintings that possess Hero Twin images has not been made by the author, but the number seems to be relatively low, and only rarely do they seem to be portrayed with other supernaturals.

As illustrated in various published versions of Shootingway Chant paintings (Newcomb and Reichard 1937; Reichard 1939; Wyman 1970b), some general characteristics of Hero Twin portraits can be summarized. Their torsos are rectangular, they wear kilts, and they normally have round heads. They are usually wearing flint armor and flint armor caps. They usually hold a club with lightning in the right hand and lightning in the left hand, or the weapons may include a bow held in the left hand, or a flint knife. Rattles may also be held in the right hand (Haile 1981:234). Lightning is commonly associated with the Twins, and Monster Slayer may or may not have lightning on his face. Jewelry such as necklaces and earrings are common. The kilts and sash belts vary considerably, with no set pattern other than they are white with colorful designs. Decorative streamers may or may not hang from the elbows and wrists. The Twins may be shown with pouches or shields. Monster Slayer is black and Born-for-Water is blue or yellow. In an example from the War Propylactic Rite, Monster Slayer is yellow and Born-for-Water is white (Oakes and Campbell 1943:Plate IX). The heads are normally brown, often with a yellow pollen streak across the chin and a white streak across the forehead. Oakes and Campbell (1943:Plate XII) illustrate a painting from the War Propylactic Rite that has white faces. Hands are white. In one example from the War Propylactic Rite, both the brothers are exactly alike in color and physical characteristics (Oakes and Campbell 1943:Plate IV). Based on the examples of the Shootingway Chant and the War Propylactic Rite, Monster Slayer is invariably the leader (e.g., Newcomb and Reichard 1937; Oakes and Campbell 1943; Reichard 1939; Wyman 1970b).
With one exception, historically documented use of Hero Twin portraits appears to be restricted to sand paintings. That exception is found on the outer surfaces of shields where warriors placed figures relating to war, including Monster Slayer (Franciscan Fathers 1910:317).

The first published identification of Hero Twin symbols was made by Washington Matthews (1897). He was informed that the symbols of the bow and hair knot represented Monster Slayer and Born-for-Water respectively. The hair-knot symbol is reported by Matthews (1897:253, n370; 1902:23) to represent the scalps of monsters, while others say that it represents Changing Woman’s hair knot. Haile (1938:22) reports that Black God directed that the bow and hair knot were to serve as essential symbols of Enemy Way. Besides the masks and body decoration, the bow and hair-knot symbols are found on ritual items. In Enemy Way, the bow and hair knot are etched onto the rattle stick (Haile 1938:31, n5). Bows are also drawn on prayer sticks used in Enemy Way (Haile 1938:37, n20). In Nightway, Matthews (1902:97, 137) reports that the hair knot and the bow are painted on kethawn or reed cigarettes. Coolidge and Coolidge (1930:171) reported that a Navajo was reputed to have a stone war club passed down from Monster Slayer himself with the bow and hair-knot symbols on it.

Lightning is another potentially distinguishing symbol that identifies the Twins. The mask of Monster Slayer is distinguished by a set of zigzag-lightning marks on one or the other cheek (Haile 1947; Matthews 1902). In the Shooting Chant, zigzag lightning is also equated with Monster Slayer (Reichard 1950:238). Zigzag and straight lightning designs may be placed on Enemy Way arrows if desired, assumingly in remembrance of similar markings on arrows used by Monster Slayer and his warriors during the war with Taos (Haile 1938:32, n6).

**ARCHAEOLOGICAL EVIDENCE OF HERO TWIN RELATED OBJECTS**

Very few artifacts representing the Hero Twins or related ritual have been recorded in Dinétah. A triangular sandstone box with a lid found in the Gobernador area was identified by Navajo informants as “Monster Slayers Flint” (Hester 1962:Figure 30). In a cache from the Gobernador area, a medicine bundle was found that was identified as the type used in Enemy Way (Hester 1962:Figure 36b). Also from the Gobernador area, Hester (1962:Figure 40c) illustrates a pair of stuffed raven skins complete with beaks and notes that raven beaks are used to scratch the scalps used in Enemy Way (1962:119; see also Haile 1938).

**PICTOGRAPH AND PETROGLYPH SITES**

Over 35 sites in Dinétah are known to possess some kind of Hero Twin imagery. Thirteen of the sites have what is assumed to be Hero Twin portraits. Four of these sites are located along or north of the San Juan River: two of the sites are located along the Pine River, one at the junction of the Pine and San Juan Rivers, and the other in Pump Canyon. The remainder and majority of the sites are south of the San Juan River: one in Gobernador Canyon, two in Montoya Canyon, one in Martin Canyon, one in Martinez Canyon, two in an unnamed tributary of Tapacito Creek, one in Crow Canyon, and one in Cibola Canyon. At these sites are 13 examples of Monster Slayer and 12 examples of Born-for-Water. Collectively, these portraits can be identified as the Twins, because they possess traits that seem closely related to depictions of the masked
impersonators in ceremonial appearances. However, the images do not seem to follow any pattern observed in sand paintings. The drawings are made using a variety of techniques that include abrading, pecking, incising, and painting.

They are usually located at or very near the junction of two canyons. With three exceptions, these portraits include both Monster Slayer and Born-for-Water. One site (LA 114,334), has two examples of Monster Slayer yet lacks a portrait of the younger brother, although his hair-knot symbol is present on an image of another ye’i. Another site (LA 3017) has Monster Slayer, but it is not certain if Born-for-Water is present. One as yet unrecorded site near Tapacito Creek has Born-for-Water but not Monster Slayer. Four sites do not have any other imagery beyond the Twins. The others have a variety of other drawings, usually other ye’i. Some limitations of the data include the ability to incorporate recent data from LA 3017 and LA 3022, because these sites are destroyed and new primary data cannot be collected. However, these portrait sites can be summarized as follows.

**Monster Slayer**

Monster Slayer (Figure 1) is almost without exception drawn using a combination of abrading, pecking, incising, and painting techniques. A round head and red-paint outline may or may not define the head. In some cases, the head is only indicated by a slight circular abrasion to the rock surface. Eyes and mouth are usually present as small holes cut into the rock. Three have lightning on the face, yet none has the bow symbol. The facial features are not painted. A single red feather usually extends out of the top of his head. At Site LA 56268, the figure may be wearing an example of a flint armor cap. The strings hanging down the side of the head may descend from the base of the feather or the top of the head. The torso is rectangular, and the arms are held upright, with the elbows away from the body and the hands at or slightly above shoulder height. Like the head, the torso and the arms are usually only minimally indicated by a slight abrasion to the rock surface: these parts of the body are not usually given a great deal of attention. However, at Site LA 57115, the body is painted a flesh color; at LA 99805, the body is painted black; and at LA 114,333, the torso is decorated with seven carved and red vertical zigzag lightning lines. One or more lines may be present that extend from each shoulder to the opposite side of the torso and cross on the chest. A short vertical line may descend from the junction of the chest-crossing lines. These same markings can be found on sand paintings of ye’ii and represent decorative apparel. The legs are also minimally treated in a manner similar to the torso, arms, and head, and occasionally the legs can only be identified by the presence of decorations at the knees and simple horizontal lines for feet. His left hand is always empty, but the right hand is usually holding a large ovate object that represents his knife. In some cases the knife is painted white, but it is just as often an abraded area that, when contrasted with the surrounding background patina of the rock, appears white. At Site LA 114,333 the knife is red. Sometimes the knife is abraded and then painted. Long vertical lines may or may not descend from the base of the knife but may actually be descending from the wrists. Elaborate decorated items, possibly representing pouches or some other ritual item, are also held in the right hand below the knife at LA 114,333 and LA 114,334. Elsewhere, vertically carved and sometimes painted lines hang from the wrist area of both hands, as well as from the elbows or biceps. At times, hatched lines are visible on the
Figure 1. Monster Slayer portraits: a) LA 3017; b) LA 3022; c) LA 3037; d) LA 56268; e) LA 56421; f) LA 57115; g) LA 78126; h) LA 99805; i) LA 114,333; j and k) LA 114,334; l) LA 114,348; and m) LA 117,432.
biceps, or more accurately, where the biceps would be. V-shaped necklace designs are common, as well as a central pendant hanging at the lower point of the necklaces. Earrings are not common but may occur. The kilt is always well defined and is normally painted red or may be carved and then painted red. At Tapacito, the kilt is black. Fringe or tassels may decorate the margins or corners of the kilt. At Site LA 99805, the interior of the kilt is decorated with two red-painted rectangular forms, and at LA 3037 and LA 114,348, the kilt is covered with pecked dots. Belts may or may not be depicted.

**Born-for-Water**

Born-for-Water (Figure 2) is, with two exceptions (LA 78126, LA 114,348), painted entirely red and unlike his brother, the head, torso, arms, and legs are always well defined. Overall, the level of adornment or other detail is less than that of Monster Slayer. At Site LA 57115, his torso is decorated with 10 scratched hair knots and 1 hair knot on his right bicep. He is round headed and may or may not have eyes or a mouth. At LA 3022, LA 78126, and LA 114,333, he has an inverted triangle on his face. At LA 3022, the triangle is white with white dots at each corner. At LA 78126, a petroglyph example of the brother, the triangle encloses a pair of eyes. At LA 114,333, the triangle is carved and outlined in black with round eyes and a mouth carved at each corner. The top of his head is usually adorned with some sort of horizontal head piece that does not seem to correlate with anything yet found in sand paintings, masked impersonators, or narrative descriptions. At LA 56268, a series of seven vertically arranged carved dots terminates near the waist at a group of four dots. This representation has a V-shaped necklace and lines extending from each shoulder to the opposite side of the torso and crossing on the chest. In most cases the Twin is holding linear objects, presumably his prayer sticks or thunderbolts. In only one case (LA 56268) does he have a kilt, and it is painted white over his red torso. In only two cases does he have a sash belt. Although one figure lacks any of the distinctive traits of Born-for-Water (LA 114,348), the image is interpreted as such because of its obvious pairing with Monster Slayer.

Schaafsma (1963) has suggested that the image at LA 3022, believed to be Born-for-Water, may actually be Red God. The image at LA 114,333 is essentially the same. Haile (1947:23) states that Red God has a mask like Born-for-Water with an inverted black triangle outlined in white. However, the descriptions given by Matthews (1902:25, Figure 4) for the same individual do not look anything like the Born-for-Water masks, nor do the images at LA 3022 and LA 114,333. The source for the confusion is unclear, but it seems clear, given the body of evidence from 11 sites, that the images are Born-for-Water.

**Placement**

All of the portraits are arranged in a linear manner. No radial compositions, such as found in sand paintings, are known at any site in Dinéh. There is sufficient information at 10 of the sites to determine who is “leading” the other. In 8 sights, Monster Slayer is on his brother’s right. At four of those, Monster Slayer is leading to his right, and at three of the sites, Born-for-Water is leading to his left. In the eighth case, the brothers are moving toward one another. At two remaining sites, Monster Slayer is on his brother’s left; Monster Slayer is leading to his left in one case, and the brothers are moving apart in the other. At LA 3017, LA 3022, and LA 114,334, there is insufficient information.
Figure 2. Born-for-Water portraits: a and b) LA 3022; c) LA 3037; d) LA 56268; e) LA 56421; f) LA 57115; g) LA 78126; h) LA 99805; i) LA 114,333; j) LA 114,348; k) LA 117,432.
As previously noted, four of the sites contain only the images of the Twins. Other human-like images that may occur with the Twins include at least one example of Gháá' 'Ask'idii, perhaps Fringe Mouth, female yé'i, and other yé'i currently unidentified. Nonhuman images are usually lacking, but they may be associated with animal figures such as bison and large birds (possibly eagles).

FUNCTIONAL DISCUSSION

Historical evidence indicates that sites with ceremonial images were used for specific purposes. Warriors went to Tó 'Aheedli (LA 3017 vicinity) to make offerings before going to battle (Matthews 1886; 1902), and water was collected there for ceremonial purposes (Haile 1981; Van Valkenburgh 1974:142, 149). Tó 'Aheedli was visited during dry years (Dittert et al. 1961:238) and during time of stress in the nineteenth and twentieth century (Newcomb 1964). It seems reasonable to assume that other sites in Dinétah possessing images of the Hero Twins were used in similar ways.

Many of these sites, if not all of them, regardless of whether or not they were considered locations of specific historical events, probably acted as mnemonic devices for recounting important stories and events. Sand paintings serve a similar function. A sand painting is seldom narrative in character, and as Wyman (1957:159) has noted, the purposes of a sand painting are fulfilled by the mere portrayal of the principle supernaturals concerned with the ceremony, and not everything about a story or event is illustrated. Little more than the personnel of the episode, sometimes the location, and a minimum of the action are all that are portrayed (Wyman 1957:159).

Recognizing an association of specific ceremonies or stories with ceremonial rock art sites in Dinétah is a possibility, albeit a difficult one. Historically, the numbers of various sand paintings are known to total over 1,000, and those that may be associated with any specific ceremony vary from 1 to over 100 (Wyman 1957:158). Any one sand painting may also have some variation based on the intended use, knowledge of the users, and the wishes of the patients or his or her families. A particular ceremony normally cannot be identified, based on any specific sand painting: the sharing of sand paintings between ceremonies is well known. Wyman (1957:159) has pointed out that, "when arranged in proper consecutive order, groups of paintings from certain ceremonials may be read by a viewer who has a thorough knowledge of the symbolism and is acquainted with the myth, so as to bring forth the cardinal episodes of the story." If ceremonial rock art functioned in the same manner, then there is a long way to go before the sites can be "read" or deciphered. Given the limitations, are there any observations that can be made regarding the use of Hero Twin imagery in Dinétah? At the risk of violating all the cautionary comments just made, the following scenario is offered.

During the early to mid-1700s, Dinétah gives every impression of a place under siege. The pueblitos are stark testimony to the danger and hostilities that must have existed. The amount of effort required to build the fortified sites and the dangerous and precarious positions they were placed in speak volumes to the lengths that Dinétah Navajo were willing to go to protect themselves. Historical accounts indicate that the Ute, a traditional enemy of the Navajo, were engaged in sustained efforts in raiding the Navajo. With this type of activity in Dinétah, along with assumed Navajo reprisals and

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retaliation, contact with the enemy in some way must have been a fairly constant pattern. A medicine bundle similar to those used in Enemy Way is known from Dinétah. Raven skins with beaks, possibly used in Enemy Way ritual, have been found in Dinétah. To'hedilth was ritually used by warriors. The use of Hero Twin imagery on implements of war has at least in one case been historically documented. It seems reasonable to conclude that much of the prolific Hero Twin symbolism in Dinétah is associated with warfare activities and that something like the Enemy Way or War Prophylactic ceremonies were practiced.

Research in the ceremonial art of Dinétah over the past 30 years has demonstrated a significant amount of stability in various imagery. If the imagery in Dinétah has been so stable, certainly there should be some stability in how that imagery is used. While it may never be absolutely known for what purposes the Hero Twins were drawn in Dinétah, we should not hesitate to intelligently speculate and consider any reasonable possibilities.

—Bureau of Land Management, Farmington, New Mexico

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ON THE TRAIL OF CHINLE'S "BIG HOUSE"

Charlotte J. Frisbie

Among the trading posts located on the Navajo reservation in Chinle, Arizona, was one locally known as Kin Tsai or the Big House. Using the results of long-term fieldwork with Chinle Navajo published sources and information from others, this essay reconstructs the history of this post, conceived by J.L. Hubbell as a trading post/hotel and famous because of its size and two-story construction. After an initial summary of the Chinle context into which it emerged, the essay examines the Big House, first during the Hubbell years (1916–1918?) and then during the years when it was owned by C.N. Cotton (1918?–1923). For the first time, information from Margaret Garcia Delaney (including photographs and an upstairs floor plan) is incorporated to explain the Garcia management period (1920–1923). Then, the multiple purposes served by the Big House after the store was closed in the 1920s are discussed, thus tracing what is known about the structure until its demolition circa 1960. Finally, questions that emerged during work on this essay are identified for future research.

INTRODUCTION

This essay assembles what I have learned to date about the two-story trading post/hotel built by J.L. Hubbell in Chinle, Arizona, and known locally as Kin Tsai, or the "Big House." My own interests in it derive from long-term fieldwork with Chinle Navajo, and a 1996–1997 sabbatical spent in the Southwest to begin preparing the personal narrative of Tall Woman (Mitchell n.d.) for publication. Given Brugge's interests in "Hubbell matters" (e.g., Brugge 1993), and contributions to our knowledge of Chinle history wherein he (Brugge and Wilson 1976:5) questions McNitt's (1963:214) "c. 1900 date" for this two-story post, a focus on the Big House seemed appropriate for this volume. However, without assistance from many individuals, this essay would not have been possible.

BACKGROUND

Chinle, a Navajo community in northeast Arizona with a current population of 8,116 (Navajo Times 1997:A-2), is known for its proximity to Canyon de Chelly National Monument. Despite its historical significance, to date, Chinle, such as many on-reservation communities, lacks a detailed community history. Thus, anyone interested in documenting developments there must delve into widely diverse literature on traders and trading posts, federal and state schools, tribal courts and chapters, Franciscan and Presbyterian missionaries and missions, the National Park Service, and other matters. To
date, two Navajo life histories, Mitchell (1978) and Stewart (1980), also provide information about Chinle; likewise, works about the artists, Carl Gorman (Greenberg and Greenberg 1984) and R.C. Gorman (Gorman 1992), provide a few other comments.

Due to spatial limitations, the history of trading in Chinle can only be briefly summarized. Trading began out of a tent in 1882 through the efforts of an unlicensed individual known only as “Little Mexican” (Van Valkenburgh 1941:39). Shut down within the year by Agent Denis Riordan, he was followed by J.L. Hubbell and C.N. Cotton who, with a license, opened the first permanent post in Chinle in 1886 and ran it for a short time before failing to get their license renewed (McNitt 1963:214). Their stone building was eventually incorporated into one of the structures at Garcia’s (or the Canyon de Chelly Trading Post). The Sam Day post, later known as Cozy McSparron’s Thunderbird Ranch/Lodge, was built next, in 1902. Chinle’s third trading post (omitted by McNitt), built by Nelson Gorman in 1910, thrived until 1919, when it was given to the community’s early Presbyterians. Evidence discussed below suggests that Hubbell’s two-story post was built in 1916, as Chinle’s fourth store.

**HUBBELL’S CHINLE BIG HOUSE**

McNitt’s (1963:214) claim that the Big House was built “probably around 1900” has been repeated by many, with some converting it to a definite 1900 date (e.g., Cousins and Cousins 1996:53; James 1977:65). Only a few have challenged McNitt; Brugge’s (1996–1997) work “with one set of Hubbell records” led him to say the post was built in 1915 or “ca. 1915” (see also Brugge 1972:34; Brugge and Wilson 1976:5, 285, respectively). Bauer (1987:Appendix 6), on the basis of her own study of the Hubbell Papers, and Brugge (1972) give the two-story post a 1914–1918 span in Bauers’ time chart of Hubbell posts. Blue’s work with the Hubbell Papers (in conjunction with Blue [n.d.]), and my own research on Chinle history suggest, like Kennedy (1965:24), that the Big House was built in the spring of 1916.

The absence of any mention of the Big House in literature on federal boarding schools or in any of the accounts of early Franciscan endeavors on the reservation immediately raises questions about McNitt’s statement. This is especially true when one understands where the Big House was located, i.e., within a mile northwest of the Chinle Boarding School (where the first buildings were constructed in 1909–1910), and across from the Annunciation Mission! The Franciscan literature is extensive, covering an initial 1902 trip from St. Michaels to assess the location’s potential for mission work, followed by Father Leopold Ostermann’s visits (which began in 1903), part-time (1904) and finally, permanent residence (January 1906), when the Franciscan residence was near completion. Construction of the rest of the complex followed (simultaneously with the boarding school), including the stone chapel and adjacent stone building that housed the community’s Post Office from 1912 until at least 1925, with Father Leopold as Postmaster (Ostermann 1913). The culmination was the March 25, 1912, dedication of the “long finished” Annunciation Mission (see Ostermann 1913, 1914; Wilken 1955, among others). Given the fact that the Big House was built on the small rise across the road from this church, to the east and slightly north, the Franciscans certainly would have mentioned its presence, had it been there in “c. 1900.”

While McNitt (1963:215) uses Franciscan data to support his date, his statement that the
October 25–30, 1902, round trip made between St. Michaels and Chinle by Father Anselm Weber, O.F.M., Frank Walker, Miss Josephine Drexel, and Sister Agatha included a visit to the Big House is erroneous. If one studies Wilken’s (1955:97) documentation of this excursion, it is clear that the trading post McNitt describes is Hubbell’s Ganado post, and that the party stayed at Sam Day’s post in Chinle, not the Big House.

Kennedy (1965:24) provides a clue by saying that, in the spring of 1916, when the Kennedys arrived in Chinle (having bought the old Day post), there was one other post “and a third one in process of being built.” Suspecting the latter was the Big House, I originally hoped to unravel its construction history here. However, what became apparent was that to do so will necessitate a future, on-site examination of the Hubbell Papers with concentration (this time) on the 1915–1918 period and this post. Blue’s (personal communication 1997) information, as well as Bauer’s (1987) and Brugge’s earlier work, provide direction. Of particular importance among the items shared by Blue are two letters; to paraphrase one, dated December 15, 1915 (Outgoing Correspondence Box 99, File Folder 18), Mike E. Kirk, writing from “Chin Lee,” tells J.L. Hubbell the license has arrived and if he wants to get started, he should send a man over, a Navajo mason, so the ground can be staked. Kirk adds, “our mutual friend has decided not to build either the hotel or the store.” In another, dated May 21, 1916 (Outgoing Correspondence Box 101, File Folder 3), Mike Kirk “at Chin Lee” writes to Don [?] to tell Hubbell they need lumber and two more adobe makers, adding “when we move into the new building I will be ready to boost [sic] of all my old customers.”

Without additional research, few other details about the beginning of the Big House can be reconstructed. It is well known that Hubbell was doing business in Chinle before building the two-story post in 1916, but where his employees actually worked is unclear beyond Kirk’s letters, sometimes written from the “Chin Lee Trading Store.” According to Blue (personal communication 1997), the Intrapost and Vendor Correspondence (Box 242) relevant to Chinle spans the 1913–1918 period. Her research also indicates that Hubbell changed his letterhead in 1913 to show the addition of the Chinle run to his stage line business. It is well known that he built the Big House to serve both as a store and hotel, expecting that tourists needing accommodations would be attracted to Canyon de Chelly.

McNitt (1963:215), Colby (1972), Bauer (1987), and Blue’s (personal communication 1997) work identify some of Hubbell’s employees (managers?) in Chinle during the 1913–1918 period. They include someone who, on May 27, 1914, complained about errors in 20 shipping invoices from Ganado, Sam Day II (? date), Leon H. “Cozy” McSparron (1915), Mike E. Kirk (1915, 1916), John K. Andrich (1917), and J.B. McCoy (1917). Bauer (1987) also notes a “J.B.W. Tay (?) (1917).” Given the Kirk letters mentioned above, it seems that he, and then Andrich, and McCoy [and possibly Tay?] would have worked at the Big House after it opened.

Further examination of the Hubbell Papers (especially Boxes 99–101 of Outgoing/Intrapost Correspondence, and other records, such as Box 322 of Daily Business Books and Records [which includes the Chinle store’s day book of March 5, 1917–September 2, 1917]) is needed before other activities actually assignable to the Big House can be

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discussed. While Bauer’s (1987) chronology assigns a “1918?” date to Hubbell’s sale of his posts in Chinle and Nazlini (on the basis of Brugge 1972:34), and Margaret Garcia Delaney (see below) also supports a 1918 sale date, these specifics, too, await documentation. All that can be confirmed now is that the Big House was sold to C.N. Cotton, after bad roads, few cars or tourists, and other matters finally convinced J.L. Hubbell that his post/hotel idea was premature and financially unsound. According to Blue (personal communication 1997), his business records do indicate that the sale was at least in part motivated by Hubbell’s accumulating indebtedness to his friend and former business partner, Cotton.

THE COTTON YEARS (1918?–1923), INCLUDING THE GARCIA YEARS (“1920”–1923)

I do not currently know who managed the store for Cotton in the beginning, although the information is perhaps retrievable from Cotton’s business records. According to Delaney (personal communication 1997), sometime in 1918, about three years after his marriage to Pauline Corez, her father, Camillo Garcia, began working for Cotton at the latter’s store in Cornfields. His initial six-month contract was renewed for “another six which turned out to be longer.” Sometime in 1919, when Cotton told Garcia he had a vacancy at the Big House, Camillo requested the manager’s job there, and Cotton, being pleased with his work at Cornfields, agreed. Delaney (personal communication 1997) said, “either late in 1919 or early in 1920, we moved from Gallup to Chinle’s Big House. I just call it 1920.” At that time, the Garcia family included Margaret and her younger brother, Abel; the other two children, Alice and Cleo, were born after the move.

From about “1920” to 1923, Camillo managed the trading post for Cotton, and Pauline took care of the tourists. Delaney (personal communication 1997) remembers her parents had a small camera and took the pictures included here soon after getting settled. She fondly recalls many, many tourists, famous artists, and other well-known people, including Mary Hart Rinehart, coming by horseback and wagon train to stay at the Big House while enjoying Canyon de Chelly. Parties at the Big House were not uncommon. Pauline prepared all the meals in the upstairs kitchen. Tourists ate with the family, and meals were served family style at specified times. Pauline also supervised Navajo girls employed to clean, help serve food, and do other jobs related to caring for the hotel’s guests. Delaney said her father employed several assistants, including a Navajo man solely responsible for “hauling water from the Annunciation Mission over to the Big House all day long because the Big House had no running water.” Relatives, including Camillo’s brother, Joe, and Pauline’s brother, Paul Corez, also sometimes helped Camillo during summer months.

Before Delaney’s photographs, the only published descriptions of the Big House were those by McNitt (1963:214–215) and Cousins and Cousins (1996:53–54). Contrary to McNitt, the post/hotel was located across the road from the Annunciation Mission on a small rise west of the Chinle Wash (east of Nazlini Wash), and within 1 mi of the boarding school. Although no traces of it remain today, the site was adjacent to the present Law and Order complex. In 1996, a blue trailer (housing some of Chinle’s law enforcement operations) was situated on part of the area where the Big House once stood.
McNitt (1963:214) tells us that the massive, two-story post/hotel was built in Hubbell style but was even grander than Ganado. Dubbed a mansion, a rock hostel, an incredibly big, mammoth facility, the most impressive store on the whole reservation (among other things, by others), McNitt (1963:214) says the Big House was built from large, dark-red sandstone blocks, “carefully cut and faced.” While he implies the walls were dark-red sandstone blocks (and thus, others say the store was a two-story stone or rock structure), Delaney’s photographs and descriptions from Chinle Navajo who traded at the Big House indicate that the sandstone blocks were used only for the bottom-floor walls; adobe bricks were used for the second story.

Although not mentioned by McNitt, the Big House was aligned on the rise so that its front side (Figure 1) actually faced northwest, and the other, long side faced southeast, toward the boarding school. One short end (Figure 2) faced the Annunciation Mission, and the other, where the manager lived, looked toward the Chinle Wash. Delaney’s photographs show that both floors included windows; on the ground level, these were of two sizes, with the lower level barred. Some Navajo living 2 to 4 mi north of the post remember becoming aware of it by first seeing “something shining to the south,” which turned out to be the sun reflecting off the unprecedented upstairs glass windows. As Figure 2 shows, the structure was also built on a slight slope; thus, while in the front, one entered the trading post at ground level (Figure 3), and in back, tourists and managers used outside stairs (Figures 4 and 5), each with 11 steps leading to a porch and “regular size door,” to access their areas. The tourists’ entrance opened into their lounge; the manager’s opened into the kitchen. An interior stairway in the tourists’ lounge led to the warehouse directly below on the ground level, exiting near an inside door into the trading post.

McNitt (1963:215) says that almost half of the ground floor was utilized as a store, with the remainder divided into “two large associated rooms.” Ceilings were 10 ft high, and 14-in. thick walls were plastered smooth on the interior with adobe. Delaney (personal communication 1997) remembers the downstairs differently, saying that of the three areas, the middle one was slightly larger. Each of the three had identical, heavy, large, outside front doors (Figure 1). The one on the right, closest to the mission and near the hitching post, was the store’s entrance. The middle door opened into the warehouse, and the third (closest to Chinle Wash), into the hay barn. Delaney added that the latter two doors were usually kept locked. She also said that the building had a “flat, dirt-covered roof” that needed constant repairs and the ground-level floors were concrete. A door in each interior wall of the warehouse connected it to the store and the hay barn (respectively). The warehouse included a wool rack on one end; wool bags were stacked around the edges of the room while merchandise (including canned goods, flour, material, and other items) was piled throughout. Alfalfa and grain were stored in the hay barn.

The southeast side, opposite the front, included “a fenced backyard” accessible through a gate (see Figure 2). Delaney said this area included at least one stone building “like a garage” that was used for storage, some outhouses behind this building, a small horse/sheep corral, and perhaps other animal pens. She also noted that the manager’s porch (Figure 5) was longer than the tourists’ (Figure 4), and extended to the corner of the building. Wood, cut for heating and cooking, was stacked beneath both porches. Delaney...
Figure 1. Front (northwest side) of the Big House, 1920. (Photograph courtesy of Margaret Garcia Delaney.)

Figure 2. Side of the Big House facing the Annunciation Mission, 1920. (Photograph courtesy of Margaret Garcia Delaney.)
remembers three stoves: a large one in the store and two upstairs, in the dining room and kitchen.

McNitt (1963:215) says the upstairs measured “some 107 feet long by 35 feet wide” and consisted of eight guest bedrooms along a long hallway, “a large living-dining room for guests, and the manager’s quarters.” Jean Jackson Cousins (Cousins and Cousins 1996:53–54), who lived with Bill at the Big House from September 10, 1934, through Christmas of 1934, says the downstairs was a trading post and hay barn. According to her, the upstairs had 16 bedrooms, and one 40-by-40-ft room that she calls the hotel lobby. The next room, 20-by-40-ft, reportedly the former hotel dining room, became the Cousins’ living room, and two other rooms, circa 20-by-20-ft each, served as their bedroom and kitchen.

Delaney’s upstairs floor plan (based on the 1920–1923 period; Figure 6) shows eight guest bedrooms, four on each side of a hallway with a small storage room at the end of each row, reportedly used for cleaning supplies, linens, and the like. The hall led into the tourist lounge, which included the interior stairway already mentioned. The lounge opened through a door into the dining room shared by tourists and the manager’s family. During the Garcia years, this space was arranged so that furniture separated and defined the family’s sitting room area. Delaney said her mother had a large, round table in the dining room, which became oval when expanded by numerous leaves. Another door separated the dining room from the kitchen, which could be entered directly from the outside by the manager. Facing the Chinle Wash, the large kitchen included a dry sink (very modern for its day) built-in against the wall under a window and arranged so that water from dishwashing flowed out a pipe to the outside. Other features included a corner wood stove; a large, oblong work table in the middle of the room; and lots of large cabinets that “held the dishes for all the tourists.” Off the kitchen was the manager’s large bedroom; Delaney remembers it, too, for another unusual feature, lots of closets.

AFTER THE GARCIA YEARS

Delaney (personal communication 1997) confirmed McNitt’s (1963:215) account of the 1923 closing of the Big House as a trading post, saying that sometime that year, her father, Cozy McSparron, and Hartley T. Seymour bought all three stores in Chinle. Details appear sketchy, however, especially since Kennedy (1965:38) reports McSparron bought the original Day post from the Kennedys in the spring of 1919, and Spears (1987) was given a 1920 year for Garcia’s purchase of the Canyon de Chelly Trading Post (as well as a 1918 date for the family’s arrival in Chinle). Delaney (personal communication 1997) said, “I know the deal was made with C.N. Cotton. My father got the only store he wanted [Garcia’s], and Cozy and Hartley got the other two. Then the Big House was closed by mutual agreement.”

Information from local Navajo, however, suggests that the Big House had multiple uses into the late 1940s, although who was viewed as “owning it” remains unclear. Seya Mitchell said, while he was a student at the Chinle Boarding School (1922–1925), Howard Wilson (Cozy’s nephew) “owned and ran the Big House” and lived upstairs while dating various Chinle school teachers. He also said during his last year at the school, Howard married Sybil Fry, Seya’s favorite teacher, and the couple left Chinle. Only then, according to Seya, was the Big House closed as a store. Other Navajo also remember continuing to shop there “for one or two more years after the Garcias left.” Referring to a
Figure 3. Joe Garcia with an unidentified Navajo customer; store entrance, Big House, 1920. (Photograph courtesy of Margaret Garcia Delaney.)

Figure 4. Unidentified young Navajo women “who helped with the tourists”; tourists’ entrance (southeast side), Big House, 1920. (Photograph courtesy of Margaret Garcia Delaney.)

Figure 5. Joe Garcia, holding Alice Garcia; manager’s entrance (southeast side), Big House, 1920. (Photograph courtesy of Margaret Garcia Delaney.)
later period, Bill Cousins (Cousins and Cousins 1996:77), who worked for McSparron at the Thunderbird for more than a year, said that when he married Jean in September 1934, Cozy owned the Big House and allowed the couple to live there in the manager’s quarters rent free until they left at the end of December 1934. Neither he nor Jean, however, make reference to a trading post still being operational on the ground level at that time.

Whenever the store was officially closed, other uses of the building are well known. For example, the public school used one or two upstairs rooms for at least two years. Non-Indian pupils, as well as children of federal employees, were not eligible to attend the Chinle Boarding School. Thus, public-school classes had to be offered when the numbers of children warranted hiring a teacher. According to Delaney (personal communication 1997), finding enough children, hiring and keeping teachers, and locating public-school classroom space were always problems in Chinle. The one-room school model, wherein one teacher taught all grades at the same time in the same place, was used. Both Jean Cousins (Cousins and Cousins 1996:24, 29, 30) and Delaney (personal communication 1997) report attending public school in Chinle, although their experiences differed and they were not in the same class. Jean started school in one upstairs room at the Big House in 1925, with a male teacher (unidentified) from St. John’s who reportedly did not last. She was then sent elsewhere, returning to Chinle only after her mother, Cordelia Jackson, married Dick Dunaway in June 1928, and switched from boarding-school (federal) teaching to public-school employment. Jean had her mother as her seventh- and eighth-grade teacher, finishing in May 1930, in a class of four as the only girl, and the first girl to graduate from the Chinle Public School. At that time, classes were meeting in a room in one of the boarding-school buildings.

Delaney (personal communication 1997) was sent to Gallup for medical treatments and started school there, while living with Grandma Garcia. She could not recall the year. The following year, she went to school in Chinle and had Mr. Platt from St. John’s as a teacher upstairs in the Big House. According to Delaney, for at least two years after the store was closed and the Garcias had moved to their trading post, the public-school met upstairs at the Big House. Chinle’s first public school teacher was Sybil Fry, who taught at the Big House for one year before shifting to employment at the boarding school. Delaney thinks Mr. Platt was the second teacher; she found him to be excellent. According to Delaney (personal communication 1997), the following year, public-school classes were moved to a room in one of the boarding-school buildings near the boys’ dormitory. She remembers a Miss Hunter as well as Jean’s mother, Cordelia Jackson Dunaway, among her teachers. By the time Delaney graduated from the eighth grade in Chinle (year unknown), a public school had been built and opened on the hill behind and east of the last row of buildings at the boarding school.

Delaney (personal communication 1997) also remembers that, while she had Mr. Platt, a couple was living upstairs in the manager’s quarters at the Big House. The man opened and ran a bakery in the former tourist lounge, after installing “big counters, his own stove, and large ovens.” Unsure of his name (perhaps Mr. Nupert?), Delaney fondly remembers the large tubs of yeast dough and the fresh cinnamon buns he always had ready for the public school children that year. She said the baker supplied all the traders as well as many other customers; the couple lived at the Big House and the man ran the bakery.
Figure 6. Plan of upstairs and backyard at the Big House, 1920–1923; long axis lies northwest/southeast. (After Delaney, personal communication 1997.)
for at least several years” before leaving Chinle.

As is already clear, the upstairs of the Big House provided living space for a number of individuals, at least some of whom rented the space. In addition to the baker and his wife, Howard Wilson, and Bill and Jean Cousins (see above) at times in the 1930s, Adelle Brown Gorman and her first three children (the third of whom was born at the Big House in 1939), Notah and Ida Tayah and family, and David and Bernice Gorman lived there. From the late 1930s until 1943, Seya Mitchell and his family also lived upstairs, renting the manager’s quarters (although he does not remember from whom).

Seya, who held a number of jobs in Chinle (1934–1939, 1942), recalls other uses of the Big House. He and Notah used the downstairs areas as “shops,” while working on coal trucks (driven by Notah and sometimes, Seya) in Tayah’s business of hauling coal to regional government schools. Seya also stored his Soil Conservation Service job supplies there, including the poisons for prairie-dog and grasshopper eradication programs. Further, he reported that the hay barn was used for storing the government’s share of hay and corn produced with equipment loaned to groups in Chinle and Valley Store during attempts to establish Farmers’ Associations in the 1930s. When Seya and his family left for the Bellemont Ordnance Depot early in 1943, the Tayahs were still living at the Big House.

DEMISE AND DEMOLITION

By 1996, local accounts of the fate of the Big House were already diverse. Father Mark Sandford, O.F.M. (personal communication 1997), said that, when he came to Chinle on August 1, 1945, two Navajo families were living upstairs in the Big House. As far as he knew, the downstairs was not being used by anyone. Both families “moved out in either 1946 or 1947, leaving the building totally deserted by 1949.” While some local Navajo disagreed, insisting that the Big House was demolished in the middle 1940s (saying it was gone when they returned from school or military service in 1944–1946), others said no, it started “falling into ruins” in the 1950s, when the unrepaired roof collapsed and vandalism began.

Father Mark (Sandford, personal communication 1997) is certain that when he left Chinle on June 30, 1950, “the building was standing, intact and unharmed.” Thus, McNitt’s (1963:215) statement, “the post now stands as a forlorn shell, roof and second floor gone, only the walls remaining,” must date from August 23, 1958, when he interviewed Camillo Garcia in Chinle. Martin Link (personal communication 1997) confirmed McNitt’s statement, saying that during the summers of 1958 and 1959, while he was working as a seasonal employee for the National Park Service at Canyon de Chelly, the Big House “was still there, but definitely falling into ruin. The roof, windows, and window sills were gone, but enough of the walls were standing to show that it had been a two-story building.”

Exactly when the rest of the structure was demolished remains unknown to me at present. However, since the site was cleared to facilitate construction of the new jail in an adjacent area in 1961 (Young 1961:282), a 1960 date seems possible. Later in that same decade, about 1969, Chinle’s Post Office was relocated to a new building erected on the former site of the Big House. When the Post Office moved to the mall in late May 1981, that building was torn down, and the site reclaimed for use by the Law and Order Division (see Mitchell n.d.).
SUMMARY

While fieldwork, reexamination of published sources, others' work with the Hubbell Papers, and Delaney's information clarify some of the structural features and history of Chinle's Big House, as always, many questions remain. Hopefully, in the future, additional work with the Hubbell Papers, Cotton's records, and other sources will yield definite construction and sale/purchase dates and clarify more details about Hubbell's business activities in Chinle during the 1913–1918 period. Of specific interest will be resources that further explain the Hubbell years at the Big House, and that clarify ownership/management issues associated with the trading posts in Chinle from 1919 to 1923. An account by Delaney would certainly be a welcome addition, as would a community history, especially one that documented construction, use, and demolition of structures in Chinle! In the interim, the trail to the Big House has again been addressed with results that both challenge and augment earlier understandings. Although the group with personal experiences from this two-story post/hotel gets smaller each year, I believe that it is still possible to reconstruct the history and significance of the Big House. But to do so, we need to work in a timely manner, with appropriate permissions, while continuing to collect and respect multiple voices, share data with colleagues, and employ interdisciplinary approaches in our endeavors.

ACKNOWLEDGEMENTS

Gratitude for various kinds of assistance is hereby expressed to many individuals. Both Martha Blue and Margaret Garcia Delaney were primary; Blue willingly shared and discussed data collected during her own work with the Hubbell Papers, alerted me to Brugge (1972) and Bauer (1987), and provided copies of Bauer’s chronology and Colby (1972). Delaney provided much of the information about the 1920–1923 years at the Big House, the floor plan, and her parents’ supporting photographs, which are used with her permission. (I currently know of no other, published photographs of this post; at present, none exist in the archives at the National Monument at Canyon de Chelly, the Museum of New Mexico, and Hubbell’s National Historic Site at Ganado.) Klara Kelley is also thanked for checking some records in the Hubbell Papers at Ganado, as is Ed Chamberlin, Curator at the Hubbell Trading Post National Historic Site, for answering questions and providing copies of Brugge (1972) and Bauer’s chart (Bauer 1987: Appendix 6). Appreciation also goes to David Brugge for 1996–1997 conversations about his own earlier work with the Hubbell Papers, and thoughts about this particular post. Among the Navajo who deserve thanks for assisting with my attempts to unravel this portion of Chinle history are the late Tall Woman and her husband, Frank Mitchell (1978), Seya Mitchell, Agnes Sanchez, Augusta Sandoval, Robert Tayah, Ned Yazzie, and Ellen Hubbard. Martin Link and Father Mark Sandford, O. F. M., augmented my data about the demise of the post. Delaney's photographs were prepared for use herein by Kathy Sullivan, student worker, Audiovisual Services, Southern Illinois University, Edwardsville. Jennifer A. Frisbie is thanked for preparing the final floor plan. Finally, appreciation is also expressed to Blue, Delaney, Kelley, and Ted Frisbie for criticisms of earlier versions of this essay. I, of course, assume sole responsibility for its present contents.

NOTES

1 Herein, the “Big House” refers only to the Hubbell two-story post/hotel in Chinle. The Navajo
name derives from both its two-story height and very long length. Readers are cautioned to remember that the name, “The Big House,” has also been applied to other structures; one is the large, stone house in Chinle that Nelson Gorman built for his family in 1916 (Greenberg and Greenberg 1984:22, photo 13). Another, of course, is the J.L. Hubbell homestead at Hubbell’s Trading Post National Historic Site in Ganado (Peterson 1989).

2 Van Valkenburg (1941:39) says the tent was on the site of the Dunaway residence in the 1930s; according to Delaney, the Dunaways lived in a stone house across the road from the Garcia post that Dick enlarged after his 1928 marriage to Cordelia Jackson (see Cousins and Cousins 1996). Both McNitt (1963:213–214) and Williams (1989:14–22) provide information about the red tape and politics typically surrounding licensing of traders. When Hubbell and Cotton failed to get their license renewed, a succession of owners (although not consecutive) followed (see McNitt 1963:214n.2; Van Valkenburg 1941:39; Williams 1989:2–22). Brugge and Wilson (1976), McNitt (1963:284), Ostermann (1914), and Wilken (1955) are among those documenting other uses of buildings at the site at the turn of the century. Camillo and Pauline Garcia purchased the post from an unidentified individual in either 1920 (Spears 1987) or 1923 (Delaney, personal communication 1997; McNitt 1963: 214–215), operating it until Camillo and his son, Abel, were killed in a private plane crash near the Chinle airstrip on October 1, 1962. Subsequently, Pauline and their oldest daughter, Margaret, continued to run the store until it was closed in December 1985 (Spears 1987) or early 1986 (Delaney, personal communication 1997), evidently then becoming tribal property. While there was initial interest in seeking historic site status for the post (located about a mile west of the Canyon de Chelly National Monument’s Visitor’s Center), the 6.4-acre property was eventually sold to Ocean Properties Ltd. for economic development purposes. A photographic exhibit on the restaurant walls in 1996 indicated that construction of a Holiday Inn began on the property on June 7, 1992. Its October 15, 1992, ribbon-cutting and grand opening received illustrated coverage by the Navajo Times (1992:A-1, 2). Delaney (personal communication 1997) hopes to document the Garcia years at the post in the future; present sources include Mitchell (1978), Stewart (1980), Gray (1986), Kelley (1987), Harrison and Spears (1989), Rosenlieb and Smillie (1990), and Mitchell (n.d.), among others.

3 Day sold the post to Charles Weidemeyer in 1905, who asked Charles Cousins to run it. When Cousins went there that spring, “it was the only trading store operating at Chinle at that time” (McNitt 1963:282). The structural and ownership history of this post (later known as Cozy’s, The Thunderbird, and “The Upper Store” to local Navajo) is well documented in Cousins and Cousins (1996), Kennedy (1965, for the 1916–1919 period), Harrison and Spears (1989), McKenna and Travis (1989), Mitchell (1978), McNitt (1963:282–287), Brugge and Wilson (1976), and Mitchell (n.d.), among others.

4 This post, Nelson’s third, was built at the north foot of “Presbyterian Hill.” Documented in Gray (1986), Greenberg and Greenberg (1984), Stewart (1980), Mitchell (n.d.), and elsewhere, the property was donated to the Presbyterians by the Gormans, who were among the early Protestant converts in Chinle. Gray (1986) documents the use of the structures at the trading post by the Presbyterians, as well as the changes through time.

5 Researchers have specific purposes when they study the Hubbell Papers (housed both in Special Collections at the University of Arizona, Tucson, and on microfiche, at the Hubbell Trading Post National Historic Site in Ganado). To date, my own work with the papers in the summer of 1990 was limited to a search for confirmation of trips to, and sales/purchases at, the Ganado post by Tall Woman’s parents and siblings. Thus, Kelley (1997) checked the Hubbell Papers at Ganado for me after I left the Southwest for a few of the records identified by
Blue. In the microfiche set labeled Vendor Files, Intrapost Box 242, were 17 fiches. Fiche 1 included 1913-1915 shipping records pertaining to Chinle; the earliest, dated March 10, 1913, was a bill from Hubbell to J.J. Kirk who was at “Canyon de Chelly Trading Store” (usually understood as another name for Garcia’s). According to Blue (1997), examples of Hubbell’s letterhead are numerous in Box 99, and documents identifying Chinle employees (1915-1917) are in Box 101. She also noted the May 27, 1914, letter (Box 99, Folder 10) mentioned in the text (but did not record the author in her own notes), and another February 25, 1916 report, indicating that Hubbell’s Chinle store had made nothing for the year. My discussions with Blue in September of 1997 made it clear that future work with the Hubbell Papers is critical to answering some of my questions and reducing the risk of publicizing unwarranted assumptions about the Big House.

Thompson (1975) and Young (1961) are among the sources discussing education on the reservation for both Navajo and non-Navajo children. Gray (1986:12, 54, 63) also comments on staff and space problems in Chinle. Thompson (1975:141) provides a particularly helpful explanation of the state-run “Accommodation Schools,” which were finally developed to meet the educational needs of non-Indian children on reservations; one of these was in Chinle.

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7 As mentioned earlier, Seya Mitchell had Sybil Fry as a teacher at the boarding school sometime during the 1922-1925 period, before his parents were told he was ready to continue his education at Fort Apache, and before Sybil married Howard Wilson (Mitchell n.d.). Seya could not remember how many years she had been his teacher, but did recall she had taught public school first and had dated Howard for more than a year before marrying him. The Wilsons are also mentioned in Cousins and Cousins (1996:27) as one of the trading families Jean visited during her childhood. At that time (unspecified), they were at a trading post at Chilchinbito (unclear if owned/managed) and had a small daughter. Delaney (personal communication 1997) said that Sybil and Howard were also friends of the Garcias, before and after their marriage; she, too, remembers playing with their only child during visits after the Wilsons left Chinle.

8 This white frame building with dormer windows, variously described as a one- or two-room school house, was extant in 1996, but awaiting demolition. After the new Chinle Public School was built in 1958 and opened in 1959, this building was converted to apartments and rented out, at least into the 1970s.
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NEW LIGHT ON THE
POCHTECA CONCEPT AND THE
CHACO PHENOMENON

Theodore R. Frisbie

Dave Brugge’s interest in and publications relating to Chaco Canyon, like mine, span well over two decades. We share a common thread: what really happened at Chaco? We are, however, at opposite ends of the chronological spectrum. Dave is interested in the Navajo, while I am interested in the pochtecan Mesoamerican connection. Dave has been on firmer ground, while I have been among the small group who do not accept an internally derived model to account for the rise of the Chaco phenomenon (Frisbie 1997a).

This paper is primarily derived from data that I have previously presented at conferences (Frisbie 1994, 1997b). It provides but “a piece of the pie”—the “piece” that addresses the most cogent part of the whole, the question relating to pochtecan presence and control over the development of the Chaco phenomenon. Although “the whole” view is in preparation (Frisbie n.d.), preparing this “piece” seems both timely and worthwhile, because good cooks know that providing a sample of a fine, flaky crust can excite the palate for a taste of the finished product. With respect to the Chaco phenomenon, I believe this might best be equated with something akin to a triple-layer pie having a strawberry-rhubarb bottom, cheesecake middle, and sour-cream topping—a gastronomic wonder! You may hate rhubarb, or strawberries, or cheesecake, or sour cream, but this combination invariably necessitates a second piece! Like many, Dave has a “sweet tooth”; need I say more?

Analogies aside, the Chaco phenomenon continues to provide numerous outlets for post-processualist archaeologists to reanalyze and reinterpret what the processualists or new archaeologists derived in their interpretative models. The most recent, Saitta (1997:11-12) briefly synthesizes them beginning with these words: “At least six kinds of models for interpreting the Chaco phenomenon currently exist.” Suffice it to say, he finds none of these theoretically adequate and offers his own, as a seventh model, which is introduced as follows:

It may be that both broad interpretive perspectives on Chaco (class-divided and egalitarian) overlook the conceivably radical ‘otherness’...of Chacoan political economy...I use a thin definition of communalism and more specific lines of evidence to produce a model that, given sustained testing alongside the alternatives, can perhaps illuminate this radical otherness. [Saitta 1997:12]
Sustained testing of all seven models would not, in my opinion, lead to a fruitful conclusion without the acceptance of the eighth theoretical construct: the pochtecan concept. Interestingly, it is NOT included by Saitta who, like other archaeologists, pay lip service (if that) to Mesoamerican influences among the Chacoans. Ripped out of context and misunderstood, these influences are simply referred to as “exotica” that represent widescale interaction/exchange (see for example, Saitta 1997:11). Also interesting is the fact that the first attempt to place the pochtecan concept in a fully localized Chacoan context appears to occur associated with my name (Frisbie 1972). That paper was a direct outgrowth of the influence of J. Charles Kelley at Southern Illinois University—Carbondale. Within a few years, he and his wife published their own hypothesis to account for all of Anasazi culture history (Kelley and Kelley 1975). This seminal article explicates much evidence for Mesoamerican “hard diffusion,” i.e., direct contact/presence, and deserves reconsideration.

Before proceeding, I should like to add another bit of “food for thought,” namely a statement by Cordell and others (1994:183):

Vital evaluation work is not getting done in southwestern archaeology. If we want to encourage firming up hypotheses, double checking results, and getting multiple perspectives on the strengths and weaknesses of an idea or model, then the rewards for individuals and projects need to be revamped to acknowledge the contributions of research that is not necessarily new and novel but that is, perhaps, a careful reevaluation of a body of data or an old idea.

Clearly, the pochtecan concept falls under the rubric of both “a body of data or an old idea”; as noted above, it will be reevaluated in this paper utilizing only those aspects that focus on the verification of the pochteca being extant in Pueblo Bonito, the core of the Chacoan phenomenon, during the eleventh and twelfth centuries. While it may be subsumed that the pochteca were responsible for and administered through power and authority over the San Juan Basin and beyond during this time, the mechanisms of their control are beyond the scope of this paper. For the latter, we might return to reexamine the “seven theories” in a new light.

**THE POCHTECAN CONCEPT IN PERSPECTIVE**

The idea that a Mesoamerican-based group of traders, i.e., pochteca, actually controlled and operated out of Chaco has never been popular among Southwestern archaeologists. Among the reasons are: (1) a paucity of Mesoamerican artifacts; (2) too peripheral to the Mesoamerican sphere of influence; (3) a lack of ball courts; (4) internally derived models account for the development of the Chaco phenomenon; (5) one should expect to find “influence”—perhaps even some “copycat” behavior; and (6) proponents of the idea rip data out of the Mesoamerican context in both time and space. A suggestion of the latter begins with the term pochteca, which is derived from the centuries-later Nahautl word used for the Aztec guild of long-distance traders!

The detractors were never able to sway me one iota; respected colleagues accused me of beating a dead horse and dabbling in idle speculation. After the early 1980s, even with the substitution of *trocadores* or pochteca-like rather than the infamous word, the literature reveals a silence. I broke it in an essay for the *festschrift* for Al Hayes (Frisbie 1986). This was, I thought, a thought-provoking paper—a highly positive comparison between the paucity of Spanish artifacts in the excavated Franciscan mission sites to an identical
situation for Mesoamerican artifacts in Chacoan sites. However, the reaction, in general, was, "...an interesting idea, but it doesn't conclusively prove anything." Although I continued to broach the subject in my Southwestern Archaeology classes with favorable responses, no new ideas were forthcoming from me or anyone else.

The hiatus was broken in an unusual way; I call it serendipity! First came Anawalt's (1993) intriguing article relating to the Aztec emperor's cloak (for whatever reason, I had not paid attention to her highly academic, earlier version in American Antiquity [Anawalt 1990]). In retrospect, I suspect the color illustrations of the former did it, and I responded because the dot-in-a-square/diamond motif that the royal cloak bore was derived from the Toltecs, and also appeared on Chacoan cylindrical jars. I provided other examples offering, among them, a Hopi ethnographic interpretation wherein the dot-in-a-square/diamond motif represents a dented kernel of corn (Frisbie 1993). Something in the back of my mind troubled me, something I recalled from Pepper (1920) and Judd (1954)—illustrations, descriptions? I began to check my copies, and I found precisely what I was looking for and more. Shortly thereafter, I read Cowgill's (1993) Distinguished Lecture in Archeology presented to the American Anthropological Association at the 1992 meeting in San Francisco. In it he suggested archaeologists pay more attention to theoretical advances in art history. Still later, when I presented this comment in an advanced special topics class (Anth. 470: The Chaco Phenomenon and Mesoamerican Connections), Chris Wallace, a history major, suggested "Ginzburg's Razor" fitted my needs perfectly. He was correct. The final piece of serendipity took place in a team-taught Ancient Civilizations course (Anth. 332). Coteacher Sid Denny began presenting Mike Coe's recent findings pertaining to the personalized aspects of Mayan cylindrical jars. Pepper's (1920) Room 28 in Pueblo Bonito came immediately to mind, as did Dottie Washburn's (1980) study of Chacoan cylindrical jars, and her unpublished study of unique Chacoan sandal ties (Washburn 1988). Combined, all of the above led me to conclude that the time had come to begin a book-length manuscript that brings together not bits and pieces of the evidence, but all of it. Some data need further checking; however, the work is well underway, and that which follows summarizes some of it.

NEW LIGHT ON THE POCYTECA CONCEPT

In his highly acclaimed study of the Florentine School of Art, Carlo Ginzburg (1985) developed a model wherein he slashed away all extraneous elements to reveal the essential core traits that emanated directly from the center. In art history, his work has given rise to the term, "Ginzburg's Razor" (Burke 1985:3), wherein, "other things being equal, the interpretation requiring fewest hypotheses should generally be taken as the most probable" [cf. "Occam's Razor," credited to the fourteenth-century English philosopher, William of Occam, who frequently invoked the Law of Parsimony to explain phenomena.] Following Cowgill's (1993) suggestion, "Ginzburg's Razor" appears to be the perfect model to verify the presence of the pochteca at Chaco.

Let us recall that Reyman (1978) presented a detailed study of what items should be expected to be associated with pochteca burials at Anasazi sites. His analysis, although not inclusive, revealed that Burials 13 and 14 entombed below the floor of Room 33 at Pueblo Bonito met a sufficient number of the hypothesized criteria (Reyman 1978:Table 12). Above the floor of this room, remains of 12 individuals were found, as were numerous
“exotic” artifacts. In adjoining Room 32, numerous artifacts were excavated, as was a single burial in the southwest corner. It is important to note Rooms 32-33 and 53-54 are interconnected by doorways, and all contained burials. Room 28 completes the set of five rooms, and through its doorway the others, beginning with Room 32, are reached. As previously noted (Frisbie 1978:212), these lower-floor rooms form the western arm of an isolatable block of more than 35 rooms that make up the central section of Pueblo Bonito. On either side, still within the original architectural structure, are similar arrangements—on the west, 25 connected rooms with the southern arm containing four interconnected rooms with burials (Rooms 320, 326, 329, and 330). While the burials are “lavish with exotica,” they do not compare in quantity with those of the central block under discussion. Because the eastern room block, to complete the trilogy of Pueblo Bonito’s central section, underwent architectural change (Kiva 75, included), the rooms that should have contained burials were not extant. However, those that did remain contained numerous artifacts, many with Mesoamerican affinities as might be noted for ALL of the above rooms. As I noted earlier (Frisbie 1978:212):

To complete the evaluation of artifacts from the Old Bonitian section [see map in Judd 1964:Figure 3], a locational analysis, albeit cursory, indicates that practically all of the artifacts of unusual or exotic nature were excavated from this section; the exceptions generally derive from kivas or dumps.

Although Lister (1978) provided an impressive trait list of approximately 50 Chaco-Mesoamerican congruences (some relating directly to the pochteca), he, like Reyman (1978 and elsewhere) and myself (1978), was not aware that there were a number of other, highly specific items that were inextricably associated with the pochteca. These traits are all described and/or illustrated in the early work done in the high status or central area of Pueblo Bonito by Pepper (1920 and elsewhere) and Judd (1954). They include: triple-tied sandals (on ceramic human effigies); a cloak-like garment bearing the dot-in-a-square motif (on a ceramic human effigy); a textile fragment, cylindrical jars, pitchers, and other artifacts, all with the dot-in-a-square motif, or its counterpart, the dot-in-a-diamond; cylindrical sandstone jar covers; and a turquoise labret or nose plug fragment. Let us scrutinize these unique artifacts individually.

Specially sanctioned dress relating to religious, political, and social conditions was commonplace in Mesoamerica, as commonly found elsewhere in stratified societies. A unique sandal tie that featured a triple ankle tie (Figure 1) was worn by the pochtecan’s god, Yacatecutli, and by the pochteca, as well (Washburn 1988). Judd (1954:Figure 61g) illustrates an identical ceramic figurine fragment of a leg and foot from Room 326. Figure 2 illustrates the sandal as worn by the god (also note cloak, although dots were deleted in the original?, cf. proper attire with dots depicted in Book 1, Florentine Codex—illustrated in Anawalt 1993:36).

Yacatecutli and the pochteca were sanctioned to wear the royal cloak with dot-in-a-square/diamond motif. Although much simpler than the elaborate feather cloaks (and paper ones, too) that these individuals wore, the dot-in-a-square/diamond was symbolically the most important garment style. It was the charter whereby the Aztec emperors legitimized their genealogical claim to rule by way of the Toltecs. The Pueblo Bonito example (Figure 3), which was found in Room 316 (Judd 1954:Figure 60), clearly illustrates the cloak-like garment on a ceramic human effigy with well-represented male
Figure 1. Ceramic human effigy fragment with triple sandal tie (3 in. high), Pueblo Bonito, Room 329, No. 336089. (Judd 1954:225, Figure 61g).

genitalia. As Anawalt (1990:291) states: “This design’s occurrence in other contexts confirms its importance and indicates the motif had pre-Toltec origins relating to geopolitical/mythological bases of authority in ancient Mesoamerican societies.”

The actual Chacoan textile with the dot-in-a-square motif was found in Room 32, associated with a burial having a mass of burnt, undecorated textiles made of finely spun yucca,

...but there was one specimen, with a design forming broad bands and squares, seemingly stamped upon the cloth. In the center of each square, there is a raised portion caused by a deft manipulation of the threads during weaving. These small elevations have been dyed with the same dark color as that forming the bands and the squares. [Pepper 1920:138]

If we can assume that the use of the dot-in-a-square/diamond motif on textiles signifies high status, as I believe we must, then its use in and on other media can be understood to convey an identical message. This understanding parallels a realization discussed by Brody (1991:xiii-xiv) which, for him, was stimulated by a trip to rock-art sites in the Four Corners area.

[The] rock art, kiva murals, pottery painting, architecture, sculpture—all visual expressive arts of the Anasazi and their Pueblo Indian descendants [—] were parts of a single, uniform, unifying tradition. No one unit of that mosaic can be analyzed without serious examinations of the others, for they cross-reference each other as though they were all part of a single classification.

Thus, the depiction of the dot-in-a-square/diamond motif on cylindrical jars, pitchers, painted wooden ritual items, etc. provides additional clues about those individuals who used the items. In essence, I propose they were of the highest echelon of the Chacoan elite. Not surprisingly, the artifacts cluster in the Old Bonitian section of Pueblo Bonito.

Cylindrical jars were widely utilized by the elite (including pochteca) of Mesoamerica for drinking cacao and atole, the latter a gruel-like drink made of finely ground white cornmeal) on special occasions, particularly during ritual gatherings. [Parenthetically, within the past 40 years, I have had on a number of occasions, atole and a second special drink made of blue cornmeal served in
Figure 2. Yacatecutli, patron deity of the Aztec pochteca. Sahagun, “Primeros Memoriales,” Codice Matritense del Real Palacio, Folio 262r. Redrawn by J. A. Frisbie (From Seler 1902-1903(2):453, Figure 13).

mugs at Zuni; for dried cactus fruit drink, see Cushing (1920:234-235, 266)]. Coe (1992:248-252) has shown these cylindrical jars to have been personalized: “This vessel belongs to...” Interestingly, aside from decorative variations in the Pueblo Bonito ceramics, Pepper (1920:121) states: “A number of the jars [114] were marked, either on the bottom or the rim, with peculiar lines and figures, nor was this confined to the decorated pieces...” Again, I suggest a direct correlation with the Mesoamerican jars. Additionally, the 75 circular sandstone covers associated with cylindrical jars and pitchers may well have another hitherto uncited Mesoamerican connection, as do the frequently cited four seating sandstone disks (i.e., Four Underworlds) placed under roof-support columns found in a number of great kivas. I believe the jar covers, in miniature, symbolically represent the “Fourth World” from which people ascended. The covers were placed on the jars perhaps before drinks were served from them. However, as evidenced by scratch marks inside a number of the jars,
they were also used to store especially important, small, ritually oriented items (worked and unworked turquoise, points, fetishes, crystals, other minerals, etc.).

The final item from the central section of Pueblo Bonito, a turquoise with matrix base labret (lip) or nose plug (see Figure 4a) is illustrated by Judd (1954:Figure 17), but identified by Judd as “Turquoise partly cut from its matrix.” Careful examination, however, reveals that the artifact is approximately half of a classically shaped plug. These were worn by the pochteca (see Reyman 1978:247, 256). Judd (1954:224-225, Figure 62d) illustrates and describes a ceramic effigy head fragment with a pierced nose, probably for insertion of such a plug (see Figure 4b).
When all of the items discussed here are combined with Reyman’s (1978:Table 12) inventory for hypothesized Chacoan pochteca burials and other Mesoamerican affiliated items from the central, high-status area of Pueblo Bonito (essentially, things closely associated with individuals residing in this section of the pueblo during their lifetimes), MORE than ample evidence is available to suggest the presence of the pochteca.

**SUMMARY AND CONCLUSIONS**

Iconography has played a central role in my rethinking of the pochteca concept utilizing data excavated during the late nineteenth and early twentieth centuries. Dave Brugge and I share a great appreciation for the research of the past; it serves us well! As I have frequently stated, in print and verbally, “It is tragic the 1970s Chaco Project did not have the opportunity to excavate Pueblo Bonito (as a ‘pristine’ site). IF the Project had, their research interests might have been very different.” Instead, their focus was concentrated on the then-current emphases—internally derived models focusing on ecologically oriented factors. (As an aside, I was flabbergasted to learn during the Pecos Conference at Chaco in 1997 that a major figure in Chacoan research was delighted about the University of New Mexico Press’ reissue of Pepper’s (1920) *Pueblo Bonito* because this person had NEVER seen the publication!). Although we have learned a great deal from the Chaco Project, we have not yet been able to find a totally acceptable, theoretical construct to account for the Chaco phenomenon. It does not have a simple solution!

The area encompassed by the Chaco phenomenon has been expanded to encompass all of the Anasazi domain with a tremendous degree of complexity, including vast road and signalling systems, as well as well over 150 interconnected Chacoan outliers. To make sense out of this empire or statelet requires an understanding of Mesoamerican prehistory, particularly northern/northwestern Mexico as it relates to possible Toltec or Tarascan/Mixteca-Pueblan influences. World-systems theory and other models to examine the problem have been the subject of relatively recent compendia edited by Mathien and McGuire (1986), Woosley and Ravesloot (1993), Ericson and Baugh (1993), as well as a number of individual papers; however, from these, the base line may rest with Kelley (1986) and his well-formulated analysis of the Durango Highlands relating to the “mobile merchants of Molino.” Time will tell!

Paramount in our current thinking must be the notion that, from whatever source, the Chacoan pochteca model is almost perfectly congruent with sixteenth-century, Aztec-derived data. Clearly, the implications are that, through time and space, the Aztec system of mobile traders, who established outposts—often in hinterlands—was unquestionably based on an earlier system that retained all or most of its elements.

In conclusion, perhaps the time has come to pay homage to Brugge (1980:1) for providing the Navajo commentary from many collaborators relating to the “Great Gambler in Chaco Canyon.” He “...controlled all the wealth of the Chaco country, and enslaved all the people...and hints that (all of) the manipulators of Chacoan society came out of the south, perhaps from far-distant central Mexico.”

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The migration of the Southern Athapaskans into the American Southwest, their differentiation into several distinct cultural groups, and their eventual spread over much of the Southern Plains and Southwest is one of the classic research topics in American archaeology and anthropology. Recent research has contributed immense amounts of new data on this topic. In this paper, I would like to suggest that models of pioneer colonization and frontiers—derived originally from history, then “universalized” through anthropology and archaeology—provide a fruitful theoretical framework for examining the Southern Athapaskan migration and spread.

In this paper, I will first summarize the history of the concept of frontiers and pioneer colonization as explanatory concepts, then illustrate the application of these concepts to Navajo archaeological studies by discussing the twentieth-century Navajo colonization of the northern Chaco Plateau, and finally offer suggestions about the utility of the frontier concept in future Navajo studies.

HISTORIOGRAPHY OF THE FRONTIER

The idea of the frontier as a process was introduced by a historian, Frederick Jackson Turner (1894), in 1893. Turner’s “frontier thesis” (as it was called) inspired a generation of historical studies, but then was criticized because all frontiers do not work the way Turner said the American one did and do not result in American-style institutions.

In the 1960s, cultural anthropologists began to examine frontiers and colonization from a cross-cultural perspective and attempted to identify just what were the cross-cultural attributes and variability of frontiers (Casagrande et al. 1964; Green 1978, 1979; Thompson 1973). Among the characteristics of frontier societies, the most common perhaps are dispersed settlement, poor transportation, reduction in social complexity, factionalism, rapid population growth, and experimentation.

Douglas Schwartz (1970) was one of the first archaeologists to attempt to apply the concept of frontiers to prehistoric migrations with his paper (in Longacre’s [1970] Reconstructing Prehistoric Pueblo Societies) on Anasazi migrants to the Grand Canyon. Ken Lewis (1976, 1977a, 1977b), with his studies of the South Carolina frontier, perhaps did as much as anyone to introduce the concept of pioneer colonization to historical archaeologists (see also Hardesty 1980).
THE NAVAJO AS PIONEER COLONISTS

Although numerous anthropologists and archaeologists (Brugge 1972; Hester 1962, 1971; Kemrer 1974) have discussed Navajo migrations, Winston Hurst was perhaps the first to interpret Navajo data in terms of the broader pattern of pioneer colonization. In a study of Navajo colonization of the Blanding, Utah, area, Hurst (1980) found that the Navajo initially moved into areas thought to be best suited for subsistence, then experimented with a variety of environments, and finally developed a stable settlement pattern.

My own research on Navajo pioneer colonization has centered around the archaeology of the Navajo Indian Irrigation Project (NIIP) south of Farmington, New Mexico (Figure 1). The NIIP is one of those massive engineering projects characteristic of the modern west. It involved first constructing Navajo Reservoir, which was completed in the 1960s, and then transporting the water to the northern Chaco Plateau, 48 km (30 mi) away, and using it to irrigate 44,550 ha (110,085 acres) of sand dunes. The NIIP is divided into 11 areas (called “blocks”), each containing approximately 4,050 ha (10,000 acres) of agricultural land and varying amounts of nonagricultural land. The roads, canals, headquarters areas, housing, feedlots, barns, other agricultural facilities, and grazing lands comprised over 81,000 ha (200,155 acres). Archaeological fieldwork for the NIIP began in 1976 and lasted through 1983. Some 84,400 ha (208,550 acres) were inventoried, and 1,923 sites with 2,318 components were recorded (Vogler et al. 1993). The 1,049 historic components included 932 Navajo components, 106 Euro-American components, and 11 components that were Navajo/Euro-American or of indeterminate cultural affiliation (Gilpin 1993:191). Excavations were conducted at 274 sites, including 64 with twentieth-century Navajo components, 7 with pretwentieth-century Navajo components, and 6 with twentieth-century Euro-American components (Gilpin 1993:191). Ethnohistoric research on the NIIP was conducted by Garrick Bailey and Roberta Bailey (1980, 1982, 1983).

The NIIP area received only limited use by the early (pre-Reservation) Navajo. Pre-Reservation (pre-1868) use of the NIIP was represented at only 17 sites, clustered in two areas (Gilpin 1993:211–217). Most early Navajo sites were in the juniper-grasslands in the eastern portion of the NIIP (Blocks I, IV, and V; see Figure 1), which are just west of the ancestral Navajo homeland on the Dinéh Plateau. This cluster included habitations as well as two highly specialized antelope-processing sites from which more than 200 projectile points were recovered. A smaller cluster of early Navajo sites was located in the western portions of the NIIP (Blocks III and VIII), where a concentration of playas had previously supported Anasazi agriculture.

Of the 1,049 sites with historic components, the remaining 1,032 sites dated to the very late nineteenth century and the twentieth century. Prior to about 1900, the lack of water and fuel prevented permanent residence on the mesa-top grasslands, which instead were used only for seasonal grazing by Navajo who practiced subsistence-level herding and who lived along the major drainages that lie outside current NIIP boundaries (Bailey and Bailey 1980, 1982, 1983). Improvements in transportation (primarily the introduction of wagons) and new technology for developing water sources began to be introduced to the area soon after Euro-Americans began settling in the San Juan River valley about 1876 (Bailey and Bailey 1980, 1982, 1983).
Figure 1. The Navajo Indian Irrigation Project, San Juan County, New Mexico, with locations of early Navajo sites.
Even as technological innovations made permanent settlement possible on the northern Chaco Plateau, improved transportation and commercial networks, coupled with high wool prices, encouraged a shift from subsistence-level herding to commercial herding. These changes were accelerated by the arrival of the railroad in Farmington in 1905 (Bailey and Bailey 1983). The earliest colonization of the northern Chaco Plateau seems to have been by Euro-American ranchers (including Dick Simpson, who established the Gallegos Trading Post and ranch in 1896 [McNitt 1962]) and subsistence-level Navajo herders. These subsistence-level Navajo herders located their sites in broken terrain, similar to the “hidden,” “out-of-the-way” settings where Cosmos Mindeleff (1898:483) reported most Navajo were living in the late nineteenth century. The permanent habitations of the earliest Navajo colonists usually had only one dwelling, suggesting that colonization was by nuclear families (Gilpin 1982:Table 12.12). Artifact assemblages contain few commercially produced goods and high percentages of bone (Gilpin 1993:Table 4.10). The butchering age of sheep and goats (33.5 months) was greater during this period than in any subsequent period, because people were trying to increase the size of their herds (Gilpin 1983:1449).

By 1914 (an archaeological horizon marked by the appearance of the rectangular, Arbuckles Brothers Coffee cans with slide-on-lids [Ward 1977]), the shift to commercial herding was largely complete. After 1914, the number of archaeological sites increased more than fourfold (from 55 to 222 [Gilpin 1993:Table 4.20]), and both Navajo and Euro-American sites were established on the open grasslands of the mesa top. Artifact assemblages on these sites are numerically larger than artifact assemblages on sites dating before 1914, the range of artifact types is greater, and the percentage of bone decreases, as the artifact assemblages come to be overwhelmingly dominated by commercially produced goods (Gilpin 1993:Table 4.10). Faunal assemblages indicate a decrease in butchering age (from 33.5 months to 27.3 months [Gilpin 1983:1449]), which runs counter to trends noted in ethnographic studies of the shift from subsistence herding to commercial herding (see L’Équipe Écologie et Anthropologie des Sociétés Pastorales 1979). These studies suggest that, during the shift from subsistence herding to commercial herding, livestock operators will increase herd size by increasing the butchering ages and by butchering fewer females. On the NIIP, however, the most pronounced growth in herd size apparently occurred during the initial colonization of the region. Experimentation in the location of sites is evident in the random distribution of sites with respect to different plant communities (Gilpin 1982:Tables 12.6 and 12.7). Experimentation in general economic strategies led to four types of commercial herding organizations: (1) large Euro-American ranches, (2) small Euro-American homesteads, (3) wealthy Navajo entrepreneurs or ricos, and (4) more subsistence-level Navajo herders.

Stock reduction was imposed in 1933, disrupting the commercial herding economy and leaving traces in the archaeological record. Permanent Euro-American habitations on the NIIP were abandoned at this time, and the largest herders of the preceding period either died or moved off the plateau (Gilpin 1983). Thus, only the more average herders continued to raise livestock on the mesa. The number of sheep camps increased on the southern portions of the NIIP (Blocks VIII, IX, X, and XI in Figure 1), and spot-soldered, hole-in-top cans began to appear in artifact assemblages, both of which may indicate intensification of livestock raising (Gilpin
Butchering age, as represented in faunal assemblages, decreased still further, from 27.3 months to 19.2 months (Gilpin 1983:1449), as families were forced to reduce their herds.

Stock reduction set in motion a shift from herding to wage work as the principal source of income, and this shift was completed in the years after the war. Sites dating after World War II have very large artifact assemblages, high percentages of commercially produced goods, and low percentages of bone (Gilpin 1993:Table 4.10). However, the butchering age of livestock, as represented in the faunal assemblages, increased for the first time, from 19.2 months to 27 months (Gilpin 1983:1449), reflecting a return to stability in herd sizes.

The colonization of the northern Chaco Plateau exemplifies three general characteristics of pioneer colonization. Initial colonization was primarily by nuclear family households, but because of the low population and extensive labor requirements of newly colonized areas, extended family households quickly emerged. Also, the earliest occupants of the area generally occupied environments similar to those that were used in the original homeland. Exploitation of these environments was similar to strategies previously used. As the region was colonized, however, experimentation increased.

More specifically, the colonization of the northern Chaco Plateau follows the pattern of a secondary frontier, as described by Carolyn Baker Lewis (1979). Lewis argues that secondary frontiers have a five-stage development: (1) the By-Pass Stage, (2) the Rediscovery Stage, (3) the Crop Experimentation Stage, (4) the Transition Stage, and (5) the Commercial Stage. On the NIIP, the period before 1900 corresponds to the By-Pass Stage of frontier development, when the area was deemed unsuitable for settlement, because it lacked fuel and permanent water sources. The period from about 1900 to about 1914 was similar to Lewis’ Rediscovery Stage, when new technology—particularly the development of wells and reservoirs and the improvement of transportation and commercial trade networks, assisted in this case by high wool prices—made occupation of the area both feasible and desirable. The period between 1914 and 1933 may be characterized as Lewis’ Crop Experimentation Stage, in which new economic products and methods of production and marketing are tested. The primary mode of production during this period was commercial herding, but this mode of production admitted at least four different strategies: (1) large Euro-American ranches, (2) small Euro-American homesteads, (3) wealthy Navajo ricos, and (4) subsistence-level Navajo commercial herders. The period between 1933 and 1950 may be characterized as Lewis’ Transition Stage, in which the success or failure of a venture is determined, and a stable economic system is developed. Declining wool prices, climatic stress, and stock reduction eliminated the wealthy Navajo ricos and Euro-American homesteaders. Among the Navajo, the more subsistence-level, commercial-herding strategy proved most successful; among the Euro-Americans, economies of scale prevailed. The period after 1950 corresponds to Lewis’ Commercial Stage of the development of secondary frontiers, during which the area is more fully integrated into the regional or national economic system. On the NIIP, this integration is reflected in the increased reliance on wage work and welfare.

Variability in rates of colonization did occur within the NIIP. The southernmost portions of the NIIP area were colonized last, after stock reduction, apparently as a result of

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people being forced to use more and more marginal environments. Langenfeld and Vogler (1993) have argued that, in areas to the south and east of the NIIP, this trend continued even into the 1950s, as people continued to colonize more and more marginal areas.

CONCLUSIONS

Although the model of secondary frontiers does not apply to the Navajo in earlier periods, the general theory of pioneer colonization raises interesting questions worth pursuing. Especially important are (1) the way frontier theory interrelates subsistence technology, social organization, and settlement pattern, and (2) the way frontier theory focuses attention on such processes as replication and experimentation. Thus, theories or models of pioneer colonization could be used to illuminate three pre-twentieth-century examples of migrations in Navajo history: (1) the migration of the Southern Athapaskans into the Southwest; (2) the colonization of the Navajo country by Puebloan refugees after the Reconquest; and (3) the Navajo exodus from Dinétah. Consider, for example, the Navajo colonization of the Defiance Plateau in the 1700s (Gilpin 1996). The earliest Navajo sites of the Defiance Plateau mirror the farming economy, site locations, and pueblos and communities of hogan settlement organization typical of Dinétah. In these ways, the earliest sites on the Defiance Plateau are what would be expected of the first wave of colonists. On the other hand, the size of the social groups represented by the pueblos and hogans are larger—sometimes much larger—than nuclear or extended families. The apparent presence of a more complex social organization than is typical of pioneer colonization raises the questions of how complex it was and what conditions prompted it. These are the types of issues raised by approaching the data from a theoretical perspective rather than just a cultural-historical one. Given the current explosion of data on Navajo origins and the resulting profusion of interpretations, a more theoretical perspective like that of pioneer colonization suggests important new lines of inquiry.

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—SWCA, Inc., Environmental Consultants, Flagstaff, Arizona
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Buck Lowrey must have gone to sleep a happy man on the night of June 15, 1929. He had spent the last two days catering to the needs of many of the more than 5,000 men, women, and children who had arrived in his front yard at Marble Canyon, Arizona, to celebrate the opening of one of the highest steel and reinforced-concrete bridges to have been built to date. The celebrants arrived by automobile, horse-drawn wagons, and on horseback. Most spent the nights camped in tents spread out over 3 mi of desert; a handful of dignitaries, among whom were the governors of Arizona, Nevada, and Utah, and the president of the Church of Jesus Christ of Latter-Day Saints, stayed in the newly opened rooms at Marble Canyon Lodge. Hundreds of tourists had failed to heed the published advice and had arrived without sufficient food. They paid dearly for the “beef stew, coffee, and doughnuts” served them by Buck Lowrey, proprietor of the Marble Canyon trading post and lodge (Arline 1972).

The days’ activities, complete with speeches, flag ceremonies, Hopi and Navajo dances, and “camp fire tales of long ago,” were part of the dream that had sustained Lowrey as he built his business on homesteaded land on the west side of the gorge cut by the Colorado River (Whitman 1929:9). As he prepared for bed that night, Lowrey must have remembered the years during which he worked for another man’s gain and the months of backbreaking labor to construct the rock buildings that were now filled to overflowing. While he worked on the west side of the gorge, his family resided on the east side, less than .25 mi away, but in order for Lowrey to be with them, he had to travel via Lees Ferry, about a 20-mi detour around the Marble Canyon gorge. At last, he owned his own post, and tourists were already there.

Lowrey’s dreams for the future were shared by many others for whom the bridge was also a symbol. Its completion would allow the transportation of goods to southeastern Utah and northeastern Arizona, which were separated from one another by the Colorado River. The region’s resources, primarily timber and minerals, would also be more easily exploited. At the time, there were two bridges across the Colorado River. One was at Green River, Utah; the other some 600 mi away at Topock, California. The construction of the bridge was also seen in progressive terms. Odessa Davenport, in an April 1928 article for *Arizona Highways*, remarked that the construction of the bridge would not only be a “decisive victory in man’s battle to tame” the Colorado River, but that its “remoteness from any human
"habitation" and the difficulty of transporting building materials and supplies were obstacles that American ingenuity could overcome. "Its location was very carefully chosen, however, as being the most practical site within hundreds of miles." The bridge, she wrote, will open a "great new north and south highway from Mexico to Canada" (Davenport 1928:9, 17). Not to be outdone in patriotic hyperbole, E. O. Whitman (1929:30), writing for Progressive Arizona, wrote that the opening of the bridge would be seen by all as "an occasion of national significance. . . . paying tribute to a monument to modern science and a history making highway link for the west."

Buck Lowrey retired that night exhausted from his labors but secure in the knowledge that his future was as bright as springtime in northeastern Arizona. Indeed, he had borrowed $10,000 from Lorenzo Hubbell, Jr., just a month before to finance an expansion of his newly opened operation at Marble Canyon, in order to accommodate what everyone knew would be an ever-increasing and lucrative tourist business. But the promises for an early spring in that high country can be elusive, and for Buck Lowrey, this was to be about the brightest moment in the next 6 years.

DAVID CROCKETT LOWREY

David Crockett "Buck" Lowrey was born at Sparta, Tennessee, on August 25, 1887. Before moving to Arizona, Buck Lowrey and his wife, Florence Wilmeth, lived near Francis, Oklahoma, where Lowrey tried his hand at peanut farming and where two of the Lowrey children were born: Mary "Mamie" Bonheur Lowrey Woodruff (born January 25, 1911) and David Crockett Lowrey, Jr. (born May 19, 1912). Lowrey was then employed as a railroad-yard worker, but an accident that crushed his leg ended that career, and the Lowreys moved near Waco, Texas, to live near Florence Lowrey's relatives. Lowrey tried his hand at farming and stockraising in 1917 and 1918 near Cleburne, Texas (Marilyn Mills, interview, Oct. 15, 1992; Mamie Lowrey Woodruff, interview, Oct. 22, 1992).

While in Texas, Lowrey met Claude D. Richardson, a descendant of the Arizona pioneer traders Frederick Smith and George McAdams, who traded on or near the Navajo Reservation in northeastern Arizona. Like his ancestors, C. D. Richardson and his brothers owned and operated Indian trading posts all over the western half of the reservation (Richardson 1986:31, see also Richardson 1966).

Richardson was a member of a profession that was already old, well-established, and well-regulated (see Graves 1998). During the nineteenth century, trading posts on and near the reservation were mainly independently owned and as numerous as competition would allow. However, by the first decades of the twentieth century, the number of posts was reduced when a handful of extended families consolidated ownership. They were the Richardsons; the Babbitt Brothers, wholesalers from Flagstaff; John Lorenzo Hubbell and his sons, Lorenzo and Roman; and the Wetherills. The Richardsons opened or bought out existing posts at Cameron, The Gap, Tuba City, Rainbow Bridge, Inscription House, Shonto, Kaibito (which they later sold to the Babbitts), and Blue Canyon. Among others, the Babbitts operated posts at Cedar Ridge, Cow Springs, Tonalea, and Tuba City. The Hubbells ran posts at Ganado, Keams Canyon, Oraibi, and eventually Marble Canyon. The Wetherills ran trading posts at Kayenta; Marsh Pass, where they traded primarily with archaeologists between 1921 and 1923; and at Piute Mesa, which was only open during the fall seasons between 1923 and 1926.
Because the owners could not oversee the day-to-day operations at all of their posts, resident managers became increasingly common. These managers were also a mobile bunch, moving from one post to another as the owner and circumstances required. C. D. Richardson hired Buck Lowrey in 1918 to manage his trading post at Kaibito, and Lowrey began what would become a 10-year stint with Richardson (David Crockett Lowrey correspondence, Western Navajo Agency, Record Group 75). Lowrey’s family would reside at almost all of Richardson’s posts at one time or another. While the Lowreys were living at Kaibito, their third child, Virginia Lowrey Greer, was born on March 22, 1920, in Tuba City. She was delivered by the local veterinarian (Mills and Woodruff, interviews, 1992). Between May and November, 1921, Buck Lowrey was employed by the federal government as an assistant veterinarian in a program designed to eradicate a venereal disease in horses on the western reservation, but a year later he was again in the employ of C. D. Richardson—this time at Richardson’s trading post at Shonto. From Shonto, the Lowreys moved to Cedar Ridge and from there to The Gap, where Lowrey was the managing trader from 1924 to 1925 (Richardson 1966:12).

In 1925, Lowrey was 38 years old. Working for C. D. Richardson provided Lowrey with an income and a place for his family to live. Florence Lowrey was employed from time to time as a clerk at the post. However, the family was not putting down roots or building equity in a business of its own. Buck Lowrey was like many men of his generation who looked at their careers of regular employment with nothing to show for it at retirement. In January 1925, Buck Lowrey began to change those circumstances. He and a partner, Carl Calvin Mayhew, applied for a license “to trade at a point where the eastern terminus of the proposed Bridge over the Colorado River below Lee’s Ferry is to be located.” They were the second traders to apply for a license at this location, the other being Kenneth Webber. In supporting Lowrey’s and Mayhew’s application, Navajo Agent Meyer noted that there would be enough business during the bridge construction to support two trading posts. In the meantime, Lowrey continued to run the post at The Gap. But before embarking on his own and leaving Richardson’s employ, Lowrey moved to Richardson’s post at Tuba City. This move was designed to last only until Lowrey could build his post at the bridge site, but because the construction of the bridge had not begun and the location was not yet profitable, Lowrey did not begin construction of his trading post, although he “claimed” the site by virtue of his application for a license (David Lowrey correspondence).

MARBLE CANYON

When Buck Lowrey applied for his license to operate a trading post at Marble Canyon in 1925, he followed the pattern established in the nineteenth century (see Graves 1998), which was proving successful at many locations on the Navajo Reservation and near Marble Canyon. At the trading post at Canyon de Chelly, Sam Day and his sons guided archaeologists and tourists into the ruins. Their business was so successful that when Cozy McSparron took over the post, he amended his business to capitalize on the increasing number of scientists and tourists arriving in the area to examine the prehistoric sites within the canyon. He expanded the size and number of buildings designed to cater to the needs of tourists. At Thunderbird Lodge, as McSparron now called his post, American-manufactured goods were sold to Navajo customers in exchange for their wool and woolen blankets, and American tourists could
look at prehistoric Indian sites in the area while looking at contemporary Indians at the post.

At Cameron, Arizona, trading posts had operated at several different locations near the juncture of the Little Colorado and Colorado Rivers. When a bridge was constructed over the Little Colorado River canyon in 1911, Hubert Richardson built a trading post at the site in 1916. The trader not only traded with the local Indians, but he also traded with the growing number of travelers on the road. In 1917, Richardson put in a gasoline service station, a restaurant, and a hotel.

In late 1923, Hubert Richardson built a trading post in the Rainbow Bridge region on the Utah/Arizona border because he believed the region’s natural splendor would be an ideal tourist spot. Richardson believed that tourists would pay up to $2,500 each to see the natural bridge, as well as many of the inaccessible archaeological sites in the region at Betatakin, Kiet Siel, and Navajo Canyon. Richardson was correct in that advanced reservations kept the almost inaccessible trading post and lodge full most of the spring, summer, and fall (Richardson 1986:49–57, 63).

To the sale of Indian arts and crafts and the region’s natural history, traders in the early part of the twentieth century added another component to their diversified clientele: movie producers, directors, and actors. Mike and Harry Goulding at Gouldings Trading Post in Monument Valley were perhaps involved in more Hollywood movies than any other traders. They accommodated film crews and arranged for Indian extras. Thus, these traders indirectly effected the popular American and European perceptions about what they believed the west was and what they believed it looked like. According to his daughter, Buck Lowrey made similar arrangements for movies shot near the trading post at The Gap Mills and Woodruff, interviews, 1992) and Gladwell “Toney” Richardson, popular western novelist and trader, also provided services to movie personnel (Richardson 1986:139, 141). The tourist business, whether it is in the form of sales of Indian arts and crafts or in the form of tourist accommodations, is an important aspect to the modern trading-post business.

The region’s natural beauty coupled with the traffic on U.S. Highway 89 would make the Marble Canyon location a sure money-maker. Lowrey ignored the fact that his location was in one of the most remote regions of the Navajo Reservation, with the lowest population density of the entire reservation (Goodman 1982:63) and the poorest Navajo (Boyce 1974:69–73). Lowrey’s dream for a tourist court and trading post was located at the end of the road from Flagstaff to the Colorado River, but until the bridge was completed, this was a dead end.

Lowrey began by constructing a trading post on the east side of the river on the Navajo Reservation. Lowrey’s Marble Canyon trading post was constructed of local rock, and its simplicity reflected the reality that it was never intended to be a permanent trading post. Here he sold to the Navajo food and manufactured goods in exchange for their wool and wool products. When the bridge construction crew arrived at the site, Lowrey’s trading post supplied the crew with meager supplies beyond their rations. But this post was only an expedient measure. Its primary drawback ironically was its location: land on the east side of the canyon was on the Navajo Reservation, land that Lowrey could never own, and any business conducted on the reservation was managed by the Bureau of Indian Affairs. There Lowrey would never be
his own boss, nor would he be free of government interference. Across the canyon, however, was land Buck Lowrey could homestead. There he could run his affairs to suit himself; there he would provide a future for his family.

Even before the bridge was completed, Lowrey's trading post was already something of a tourist stop. In an article about his travels entitled "Behind the Beyond," Phil Townsend Hanna (1928:14) remarked that the beauty of the region was greatly enhanced by the presence of Buck Lowry [sic], who with his gracious wife, caters to the creature comforts of the wayfarers who pass that way. Buck is a typical Indian trader who has spent his life among the nomads. We sat upon the screen porch of his ranch house until another day was born listening to his illuminating and entertaining stories of Indian life, the while the mighty Colorado purred by at our feet.

After the bridge was opened in 1929, tourists arrived to marvel at man's accomplishments. Ernest McGaffey traveled from southern California via Williams, Arizona, to the south rim of the Grand Canyon and on to Cameron and Tuba City. His objective "was the newly-opened Grand Canyon highway bridge across the Colorado River at Marble Gorge" (McGaffey 1929:7-8). The Fred Harvey Indian Detours made their first stop at Marble Canyon in April 1929 (Thomas 1978:205–211). The tour guide wrote that on Thursday, May 9, "we took lunch with us and drove to Lee's Ferry to see the new bridge across the Grand Canyon." On the way, the tourists stopped at the trading posts at Willow Springs, The Gap, and Cedar Ridge, then they followed the road as it paralleled Echo Cliffs to Marble Canyon. "The Bridge," she wrote, "is really a marvelous piece of engineering and it gave us a thrill to take the first Harveycar across the Grand Canyon. Mr. and Mrs. Buck Lowrie [sic] have a Trading Post and Hotel at the Ferry [sic]” (as quoted in Thomas 1978:210–211).

THE DEPRESSION

The crash of the New York Stock Exchange in October, 1929, was not heard at Marble Canyon Lodge, but its effects were felt by Buck Lowrey, the infant tourist industry, as well as by many Indian traders on the Navajo Reservation and by the Navajo themselves. For the Indians and the traders, life never resumed its pre-Depression ways. For David Crockett Lowrey, "his life was never the same" (Marilyn Mills interview, 1992). On March 16, 1929, Buck Lowrey borrowed $10,000 from Lorenzo Hubbell, Jr., to expand his operation. Because the infant tourist industry in northeastern Arizona was all but shut down by the nation's economic woes, the loan, which carried a 10-percent annual interest, had not been repaid by the fall of 1935. Lowrey had attempted to refinance the debt through the Reconstruction Finance Corporation, a New Deal program designed to refinance bank debts, but he had been turned down by them and by Valley Bank, an Arizona bank (Correspondence, 1935–1937, Offices of Marble Canyon Company [OMCC], Inc., Clark to Hubbell September 10, 1935). By 1937, Lowrey faced a judgement of $625.00 from Albert A. Hays, the receiver of the J. D. Hallstead Lumber Company. Lorenzo Hubbell, who was also facing a severe cash-flow problem of his own, paid the debt (OMCC, Assignment of Judgement, March 11, 1937, Phoenix, Arizona) and encouraged Lowrey to find some way to refinance the original loan. If that was not possible, Hubbell promised to help Lowrey find a buyer for the Marble Canyon Lodge
Hubbell and Lowrey tried to interest Earl Shirley of the Fred Harvey Transportation Company at the Grand Canyon in the Marble Canyon Lodge (OMCC, Hubbell to Shirley, March 18, 1937), but the Fred Harvey Company was having its own economic problems. The $40,000 asking price for the land and improvements was too steep (Thomas 1978:305).

Had Buck Lowrey remained a trader on the Navajo Reservation, he would not have been able to pay off his debt by selling the land and improvements. He could have sold only his inventory and whatever improvements the buyer was willing to pay for. That he had built Marble Canyon Lodge on land he had homesteaded meant that Lowrey could sell his land as well as the buildings and his inventory (General Land Office Homestead Entry, 1933). There were ultimately no buyers for the Marble Canyon Lodge. Over the life of the loan, Lowrey had paid Lorenzo Hubbell, Jr., $50 on the interest; the balance of the loan was almost $18,000. Hubbell finally took the facility in lieu of payment of the debt 8 years to the day following the stock-market crash (OMCC, Hubbell to Lowrey, October 29, 1937).

Nora Cundell, a British author who lived off and on at Marble Canyon, was there when the Lowreys left Marble Canyon. As she rode away from the canyon, she wrote that she “felt that the whole, vast Vermillion Cliffs, and all that they had stood for, were crumbling and dissolving, as in a dream that is past” (quoted in Rusho and Crampton 1992:103–104). From Marble Canyon, Buck Lowrey and his family moved to Flagstaff, Arizona, where he and his son, David, ran a service station. During the Second World War, Lowrey worked as a security officer at the U.S. Army Navajo Ordnance at Bellmont, about 10 mi west of Flagstaff (Flagstaff City Directory 1948–1949). Florence Lowrey died of cancer in 1949. Buck Lowrey remarried Alice May Reyktal of Prescott, Arizona, about 1951 and then moved to Scottsdale, Arizona, where he died in 1963 (Mills, interview, 1992).

What is remarkable about David Crockett Lowrey’s years on the Navajo Reservation is that his experiences are so unremarkable—they are the experiences of many trading-post managers. They enjoyed years of continual employment but left the business with nothing much to show for their years except for unique experiences and memories. Unlike his peers, however, Buck Lowrey managed to build, own, and operate his own trading post. He expanded at a time when business in the United States was booming and when the infant tourist industry in northeastern Arizona was expanding. However, when the tourist industry failed to develop because the nation’s economy collapsed, Buck Lowrey did not have the financial reserves to weather the storm. Like many Americans who had enjoyed full-time employment in a variety of businesses, Buck Lowrey found that his business was both overextended and undercapitalized. Neither his hard work nor his perseverance, not even his dreams, were enough to pay off his indebtedness.

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HOME TERRITORY: CUSTOMARY-USE AREAS

The Navajo mostly reside on or near the vast Navajo Indian Reservation, the three satellite reservations (Ramah, Cañoncito, and Alamo), and on allotted ("checkerboard") and purchased lands in Arizona, New Mexico, and Utah. They possess a strong feeling of attachment to their land. The Navajo’s sense of home and homeland exists on more than one level. At the highest level is the sense of belonging to the supernaturally sanctioned Navajo Country as a whole (Dinétah; Jett 1998). Until fairly recently, this perception was perhaps mainly religious and abstract; it was associated with the concept of Navajoland itself and did not involve a significant sense of membership in a tribe. Within the Navajo Country are many local communities, successors of old-time small local bands or land-use communities that occupied given areas (and since about 1930, usually organized into the local Indian Service-imposed political entities known as chapters [Goodman 1982:20–21]). Through World War II and to some extent to the present, these local communities—and above all the clans (dóone’é) and the local extended-family kin groups (dah ’oonétígíí) comprising each community—weighed more heavily in peoples’ minds than did the tribe (dine’é) or the reservation (with allotted and purchased lands, Diné Bikéyah) or Navajo government as a whole (Edmonson 1966:155). Within the communities are the territories (diné t’áá bił naházh’áágí) of individual families (homestead groups) or extended families (resident lineages), used for subsistence farming and livestock-raising (Jett 1978a). Families occupied usually isolated rural homesteads (Jett 1980) and engaged in seasonal movements between farms, pasturelands, and firewood sources (Jett 1978b).

Traditionally, land was eternal and therefore not ownable by impermanent individuals or families. Nevertheless, use rights to farmlands and homesteads could be owned (as long as they continued to be exercised), and a family’s croplands and homesteads were recognized as belonging to that family in this sense (Haile 1968). Originally, pastureland use rights were not owned in any sense; such lands being open to all. However, with population growth and increasing sedentism since at least the 1890s, and especially with the grazing-permit system introduced in the 1930s, possession, exchangeability, and inheritability of grazing rights to particular areas of pastureland have become institutionalized. However, boundary fencing is still absent over large areas (for example, Downs 1964:85; Kelley and
Whiteley 1989:51–52, 83–86, 119–123, 154–158). The Navajo say, “Sheep is life” (Wood et al. 1979), and one’s traditional pasturelands—every significant detail of which is known and from which one knows how to make a living—are very dear. In fact, “in the Navajo world, where nonhuman entities—baskets, houses, and Mother Earth—have qualities of personhood, the attachment to place is inalienable from the definition of life....at every step, from birth to death, the connection between individual and place is reaffirmed in the action and process of contemporary living” (Schwarz 1997:45, 47).

Thus, there is a strong sense of linkage with customary-use (traditional-use) areas. Families keep mountain-soil bundles (dzileezh), which contain earth from the four primary sacred mountains of the directions, thereby tying families to Dinétah. These bundles sometimes also contain, in their centers, a sample of earth from a local sacred mountain (as well as “talking prayersticks”—small aragonite carvings of a couple with babies—and effigies of game animals and livestock made of the directional “jewels,” to effect increase [Gill 1981:64; Gold 1994:247). This provides a more localized tie to the land.

Schoepfle et al. (1988:64) wrote, “What is often referred to as a ‘summer camp’ (keeshi [keeshi or shiik’eh]) and a ‘winter camp’ (keehai [or haik’eh]) are really homelands to which Navajos are deeply attached emotionally and religiously....” In Navajo, a homestead group’s productive land, or at least, farmland, is that family bikéyah. This term consists of bi-”, “its”; ké, “feet”; and yah, “beneath.” Thus, Yázhi bikéyah, for example, would mean, literally, “under the Yazzie family’s feet.” The feet, of course, are those by which humans are in contact with the earth. Navajo educator Grace Anna McNeley (1987:163–164) wrote the following:

The Navajo word shikéyah, where shi refers to self, means “that which is under my feet.” This is an affirmation of my self-identity, that which makes me “me” or that which makes me who I am. It does not, in my view, indicate my ownership or possession of the earth beneath my feet. The concept of human possession or ownership of the earth is an Anglo orientation. Rather the term shikéyah expresses the Navajo concept of a bond between earth and the individual. The initial bonding with the earth is established at the time of the birth of the infant through the practice of allowing the birth water, hats’iis to’, to flow into the earth. The Navajo affirms this bonding with the word shikéyah. It is much like the bond existing between the infant and his or her mother [bimá]. Again, in the [Native American] poet’s [Simon J. Ortiz’s] words, the people and the land “are in a family with each other.”

The Navajo term kétt'ól—derived from ké, meaning “feet” and tl’ól meaning “root system”—expresses the concept of having a foundation for one’s life in the earth, much as a plant is rooted in the earth. The nourishment for the life of the plant derived from the network of the root system it establishes, with the eventual outcome of productive fruiting. However, if the root network is jeopardized, the plant will not thrive. So, too, the Navajos believe that they have a root system which also nourishes their lives, and if it is damaged they also will not thrive. Let us visualize the central root as extending all the way back to Asdzaan Nadleehe, “Changing Woman”—who is Earth Mother herself. Developing from this main root is the complex web of kinship relations extending back even to ancestors and
including clan relations, the extended family and the immediate family. Tied into this system are material goods, familiar surroundings and livestock. This webbing of earth, of ancestors, of clan relations, of extended family, of material goods, of livestock and familiar surroundings all constitute a Navajo home, enabling those within it to flourish, to thrive. Indeed, all of these elements are kindred with the people. They are family through kinship with the land....

Remove me from my home and you have severed my roots, you have severed my bond with my mother. You have severed my family. I will wither and die.

Clearly, Navajo have “religious and emotional ties...to their place[s] of birth” (Brugge 1994:89). More traditional Navajo believe that they are literally connected with Mother Earth at birth, through local burial of their umbilical cord and placenta and local disposal of the water of the baby’s first bath and of subsequent ceremonial bathings through life: “Placement of a child’s umbilical cord...establishes a child’s relationship to his or her physical landscape, anchoring the individual to a specific place,” just as the cord tied the fetus to the mother (Schwarz 1997:48; also, 43-44, 50). “My umbilical cord is buried in the sandy earth here at Canyon del Muerto,” said Canyon de Chelly farmer Woody Ben. “My mother buried my cord at birth. It links me to the earth, forming a mother-child relationship. I call the earth my earth mother” (Reid 1992:121). Katie Henio of the Ramah area of New Mexico, stated that “My parents buried the umbilical cord from my birth out there, in the corral—to show their wish that sheep would be the center of my life” (Thomson and Conklin 1995:22).

“Like all children of traditional Navajo families, [Verna] Tullie [of the Star Mountain, Arizona, area] received her ceremonial introduction to the land right after birth, when her parents buried her umbilical cord near the hogan. ‘In this way, I have grown up with the land,’ she says” (Johnson 1987:22). Relocatee “Betty Tso still dreams of returning to [Mosquito Springs, Arizona,]...where she was born—to the spot where her placenta and those of her mother and grandmother are buried, as is the Navajo way” (Boorstein 1997:6A). “In their own land are buried the bones of their ancestors. In their own land are also buried their umbilical cords, around which the soul is believed to wander at night” (Benedek 1995:55; also, Navajo-Hopi Land Commission Office n.d.).

Even if resident elsewhere, “people feel a profound sense of belonging to the locations where their cords are buried and return as often as possible during weekends and vacations” (Schwarz 1997:49). Likewise, Emma Yazzie of Fruitland, New Mexico, said, “we are born of the earth,” and she wished “to return to rest” in the earth of her home place so that her bones would join those of her ancestors (Grinde and Johansen 1995:120). Many Navajo, especially singers (medicinemen), establish personal praying places near their homes as well (Joe Price, personal communications on various dates), creating a further tie to locality.

The reciprocity between land and people is not sufficiently emphasized in the literature (Jett 1998). It is important to note that locally performed prayers and ceremonies and even the acts of daily living benefit not only the human participants, they also “serve to rejuvenate these locations. As a part of Mother Earth, each customary use area is dependent on the nurturing of members of the Navajo family given stewardship over that
location who are intimately connected with that place through incorporation of detached parts of their bodies—umbilical cords, afterbirth, skin cells—into various sites surrounding their matrilineal homes....The dependency between Navajo and the earth is reciprocal," people taking care of the land as the land takes care of them (Schwarz 1997:50–51). This caretaking is accomplished through husbandry, correct human relations, thought and spoken words, and ceremony. The land and air respond to human behavior just as humans must respond to the givens of the land and the vagaries of the atmosphere.

"The relationship between a Navajo individual and the land of his or her family is considered to be grounded in tradition and religiously determined" (Fransted 1982:211). Navajo elders instruct their descendants "to take care of the land and the water and not to give them away" (Brugge 1994:164).

The Navajo-Hopi land dispute (Brugge 1994) brought these feelings to public attention, and many expressions of these sentiments are recorded in the literature of the dispute. Some examples, by Navajo who were ordered to relocate from the Hopi Partition Lands (HPL), follow. The Biakeddy family’s sentiment is "[O]ur ancestors were born here. It’s unorthodox of the Navajos to abandon their land. The government tells us to relocate; we see it as an abandonment of Mother Earth" (in Reid 1992:122). "We get everything from our land. We get food from our land; we get teachings—all related to the land....you’re taught that the land is going to be your Mother for life, that she provides for you, she takes care of you, she’s the one that lays out the lesson plan daily so you can learn from her. When you accept money for your land—it’s like accepting money for your own mother. Relocating is like selling out on your people—giving up" (Ella Bedonie, Coal Mine Mesa, Arizona; Benedek 1995:77). “We have always lived here [on Howell Mesa, Arizona]....This land is sacred. The mountains are sacred. The springs are sacred. We make offerings to these places and the offerings are sacred” (Pauline Whitesinger, in Johnson 1987:18).

The sentiments continues “This land means everything to us. From now on, don’t bother our land, our water, or our mountain. These things were placed here for us to use forever” (Pauline Whitesinger, in Kammer 1980:6). “I am well known among the hills, among the ditches, rivers, streams, plants. I have touched them in various ways and they have touched me the same. There is no place but here” (Asdzaa Yazhi Bedoni, Arizona; in Benedek 1995:77). “This is our home. This is where we have always been. This is where the Creator put us with the plants and the livestock. We cannot live anywhere else” (Bessie Hatathlie, Coal Mine Mesa, Arizona; in Benedek 1995:77). In a relocation place, “The wind won’t know me there. The Holy People won’t know me. And I won’t know the Holy People. And there’s no one left who can tell me” (elderly Arizona Navajo woman; in Benedek 1993:viii, 1, 19). “Each day I pray to the Holy People so that we may remain on our own land. I earned my place, my homeland....” (Cecil Miles, Sr., Teesto, Arizona; in Eck 1982:39, 41). “Moving from here would be a slow death” (Ruth Benally, Hardrock, Arizona; in Kammer 1970:11). “Such ‘slow death’ results from being cut off from the personal renewal attained from communication with one’s special area within Navajo sacred space.” One woman summed up these sentiments: “If we leave here, we will grieve for our homeland, and it will kill us” (Schwarz 1997:49, 50). Trudy Griffin-Pierce (1997:5) summarized, “Such a finely tuned sense of place means that being forced to leave one’s homeland results in
psychological trauma that is unimaginable to those of us without geographical attachments.

The family’s farm is a focus of sentiment. “Biakdeddy believes that the earth and the Holy People are alive when he goes out into his cornfield and digs a hole. ‘I kneel down, hold my ear to the earth, hear humming inside,’ he says. ‘I understand that as a conversation taking place between the Holy People, or you can hear the movements of the earth’” (Reid 1992:122). Maize itself and its pollen play a key role in Navajo religion (Reichard 1963:422, 540–541). Wild plants are the dress of the earth, and particular places provide specific ritual and medicinal plants.

**THE HOGAN**

One may also mention the role of the hogan (hooghan, “home place”), the one-roomed circular or polygonal traditional dwelling (Jett 1992, 1995; Jett and Spencer 1981). “At the center of the Navajo world is their shelter, the hogan” (Locke 1979:13; also, Kluckhohn and Leighton 1962:89). “The hogan is an integral part of the Navajos’ connection to the land; it represents a piece of personal property and consists of natural elements such as stone, wood, or mud....The hogan...has significant religious meaning....The inside of the hogan is a symbolic representation of mother earth’s womb” (Hooker and Running 1991:100, 103); and the hogan, in turn (and the earth), is symbolized in the design of the Navajo ceremonial basket (ts’aa'; Monument Valley High School n.d.; Schwarz 1997:48–49, 52) and is depicted in curative sand paintings. “The hogan is the fundamental symbol of the Navajo spiritual universe. It is simultaneously the physical shelter of the earth-surface people and the First Hogan of the Holy People, at the place of emergence—the primordial ground of the Navajo people” (Gold 1994:244).

On the floor of the first earth-surface hogan, First Man and First Woman laid out the prototype world (Schwarz 1997).

The hogan, which is the most distinctive landscape manifestation of Navajoness (Crumrine 1964), is perceived as a microcosm of the Navajo cosmos (Benedek 1995:56–57; Lamphere 1969:286–288). Wesley Thomas of Mariano Lake, New Mexico, wrote, “The hogan itself is composed of the universe: the roof is father—the sky—and the ground is mother—the earth. Inside the hogan, the mountains (pillars) hold up the sky above the earth, and the humans reside in the middle” (Bonar 1996:154). Griffin-Pierce (1992:92–96) wrote, “Some Navajos conceive of the earth’s surface as being covered by an enormous transparent hogan...with the Sacred Mountains as its cornerposts....The hogan is a living entity, with the smokehole as its breathing hole; this is where prayers emerge and rise to the heavens.” According to Newcomb (1940:23–24), the hogan was constructed in the circular shape of the sun, for “the sun[,] being the source of heat, light, and protection from the evils abroad at night[,] symbolizes the qualities that were desired for the home” (also, Kent 1982:131–135). Emily Benedek (1993:71; see also Johnson 1987:18) put it this way:

_A hogan is a symbol of all that is Navajo. The hemispheric hogan represents the shape of the Navajo universe—that is, the land between their four sacred mountains. ‘The [old-style, conical, “male”] hogan has four main posts, which represent the four sacred mountains,’ Mae [Tso] explains. ‘The two doorway posts [also] represent the other two mountains [Huerfano Mountain and Gobernador Knob]. The top of the hogan represents the Father Sky. The bottom part is Mother Earth. Between these two are all living things. In the middle of the hogan is a_
place for the fire. In our ceremony, all our songs and prayers are within the hogan. Because the hogan represents all creations, all the teachings are also there.'

Another Navajo, Bessie Hatathlie, said, "in the Navajo way, there is a lot of respect for homes. A hogan is composed of the earth and also of the heavens. The top of the hogan is the heavens. And then the pillars that hold up the homes are the gods that represent the Navajos. It's a very holy place. That's where you raise your children. It's a very spiritual place, and you pray in there. And you have your house built [facing the dawn] so that the gods can visit you every morning and look around in your house" (Benedek 1995:9). A third Navajo expressed these ideas as follows:

The hogan is built in the manner of this harmony. The roof is in the likeness of the sky. The walls are in the likeness of the Navajo's surroundings: The upward position of the mountains, hills, and trees. And the floor is ever in touch with "the earth mother."

The hogan is comprised of white shell, abalone, turquoise, and obsidian [the jewels of the directional mountains], bringing the home and the sacred mountains into one sacred unit. The home is also adorned with the [light qualities of the cardinal directions:] dawn, the blue sky, the twilight and the night—the sun in the center as the fire....

The hogan is a sacred dwelling. It is the shelter of the people of the earth, a protection, a home, and a refuge. Because of the harmony in which the hogan is built, the family can be together to endure hardships and grow as a part of the harmony between the Sacred Mountains, under the care of "Mother Earth" and "Father Sky." [Louis 1975:3]

Navajo Wilson Aronith said, "A [domical] female hogan is our mother," possessing a mind and feelings. She is lonely when the occupants are away and glad when they return. She "takes care of you" (Schwarz 1997:20).

"If you are not spiritual, the hogan is a foolish, inconvenient place to live. If you are spiritual, the hogan is a holy place, the right place for a Navajo to live" (Murray Lincoln; in Bodo and Fryzel 1974:45). Hogans (and, sometimes, other habitations such as sweathouses, outdoor ceremonial sites, and traditional grave sites) are blessed (usually by a medicineman [Hataatii, Singer]) when established. They thereby become sacred (Doyel 1982:637). The hogan is the usual place where the myths are retold (mostly, in wintertime)—these stories (Diné bahane') being not only cosmological but also providing models for proper human behavior and people's relations between one another and the Cosmos (e.g., Zolbrod 1984:25). Hogans are the only suitable places for most ritual (nahagha; Jett and Spencer 1981:14–15)—which, when performed, further sanctifies them. During ceremonials held therein, songs are sung to cause that hogan to become the dwelling of the Holy People (McAllester and McAllester 1980:13). Prayers and songs are performed and sand paintings made, to put the subject into harmony (hózhó)1 with the cosmos. One song from the core ceremonial, Blessingway, is in part as follows: "Earth's body has become my body[,] by means of this I shall live on./Earth's mind has become my mind[,] by means of this I shall live on" (Witherspoon 1977:26; see also Witherspoon 1974; Farella 1984).

It is important to emphasize the interconnectedness of all these things, the wholeness and ordered nature of creation, both macrocosm and microcosm.
"Cosmological order is...reflected in the concept of wholeness; inherent in this view is the understanding that each part or facet is interrelated and equally necessary to the totality....the completed entity is much more powerful than the sum of its parts; power derives from the state of completeness" (Griffin-Pierce 1992:65). This is epitomized in the common ritual phrase, "It is finished in harmony." Wholeness and complementarity are also manifested by the hogan interior’s being conceptually divided into a northern, female half and a southern, male half (Jett and Spencer 1981:22-23). Further, “the principal goal of all ceremonies is the preservation or restoration of universal harmony. The individual can thrive only when the community is healthy and at peace with surrounding nature. Conversely, the well-being of the individual makes the entire community prosper” (Lindig and Teiwe 1991:170). Note once again the concepts of completeness and reciprocity.

The atmosphere of the domelike hogan—with its enfolding quality, central hearth or stove, and skylight-like smokehole—is extremely reassuring and homelike, especially when the sound of the mother batting down the wefts on her loom—the heartbeat of the hogan—is in the background (e.g., Thomas 1996:34).

“Forever, the Navaho will be torn between the irresistible appeal of far away places and the almost biological need of returning to the dark and womb-like security of the hogan” (Astrov 1950:48).

ACKNOWLEDGMENTS

I wish to thank Lawrence E. Estaville and Richard L. Nostrand for inspiring this article, and those individuals plus David M. Brugge and Charlotte J. Frisbie for commenting on an earlier draft.

—University of California, Davis, California

END NOTE

1 In the Origin Legend, after the First People plan and arrange the cosmos, Dawn and Evening Twilight “are sent on a tour of the newly created earth. They ascend each of the mountains and their inspection reveals that the world is extremely beautiful. Indeed, this state of order, a state in which all living things are in their places and in proper relationship with all living things, constitutes the very definition of beauty (hózhó), which is central to Navajo world view. It stands in contrast with the preemergence condition of disorder, chaos, and ugliness (lhócható)" (Gill 1983:504; also, Benedek 1995:52, 59).

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In the introduction to his 1994 book, *The Navajo-Hopi Land Dispute*, David Brugge explains why he felt compelled to reexamine and write about this unique intertribal land dispute that was logged by the federal court as *Healing v. Jones*:¹

What I have written here is intended to present not merely yet another view of the Navajo-Hopi dispute, one that I feel I owe the Navajo people, but in addition such insight as I have been able to gain after years of thought and a restudy of the events that led up to the lawsuit, what happened in court, and what transpired in the wake of the judges’ decision. [p. x]

Brugge (1994) details the preparations that the Navajo tribal government undertook for hearings, the drama of the federal courtroom hearings, and the consequences of the subsequent ruling that ceded a large portion of the western Navajo Reservation to the Hopi. Brugge argues that the ruling against the Navajo position was influenced by the prejudiced and stereotyped portrayal of the Navajo, a strategy initiated and fostered by the legal representatives for the Hopi Tribal Council.

The aftermath of the *Healing v. Jones* marked the beginning of a number of other lengthy court battles between the two tribes, some of which have yet to be settled. Legislative and court actions that followed the outcome of *Healing v. Jones* led to the partitioning of the land, resulting in the dispossession and displacement of many Navajo families.² Although significant numbers of these Navajo families have relocated since the passage of the Settlement Act, a few of those still remaining on the land have recently accepted a 75-year lease with the Hopi Tribal Council, allowing them to rent back their homes and some portion of their former land. In accepting the lease, these families have also agreed to be governed by the Hopi Tribal government.

In addition, a number of Navajo families have not relocated or agreed to a lease; instead, they remain steadfast and continually refuse to move. These families are now considered illegal residents by the Hopi Tribal Council, and what will happen to these families in the coming months is not known.

The land dispute has been a subject of a number of books, legal analyses, and numerous articles. Unfortunately, the impact
of *Healing v. Jones* and other related court actions on Navajo communities has not been closely examined. This paper attempts to address this void by examining some of the human consequences of the dispossession and displacement on Navajo families living in the Hardrock Chapter.

**THE LAND DISPUTE**

Although the size was considerably smaller than what comprised the original ancestral land-use area, the new boundaries of the official Navajo Reservation were established as part of a treaty agreement with the Navajo who participated in the "Long Walk" and the 1868 treaty that ended internment for tribal members at Bosque Redondo in New Mexico.

The Navajos' Long Walk in 1864 to Fort Sumner was the culmination of a bitter military campaign against the Navajo that concluded with the eventual removal of 11,468 Navajo to Bosque Redondo, a 40-mi-sq reservation near Fort Sumner, New Mexico (Williams 1983). Bosque Redondo, or *Hwelte* as it is known by the Navajo, is remembered as a bitter holocaust.

On the dawn of June 18, 1868, when the Navajo began their journey back to the new Reservation, Bailey (1978:235) writes that "a column, ten miles long, left Fort Sumner under the escort of four companies of cavalry." In subsequent years, the boundaries of the new reservation were extended by presidential executive orders to accommodate the growing population and the need for additional grazing land.

For one of these presidential actions in 1882, President Chester Arthur signed and approved an Executive Order Reservation, placing approximately 2.5 million acres of land in northeast Arizona aside "for the Moquis (Hopis) and such other Indians as the Secretary of the Interior may see fit to settle upon." The area delineated was settled by members of the Hopi and Navajo tribes.

Disputes between Hopi and Navajo families over farming or grazing land were noted by government officials before and after 1882, but were largely ignored until the twentieth century, when energy companies pressed for access to the land and to its legal owner or owners. The federal response to this pressure led to investigations, litigations, and an unprecedented congressional action aimed at adjudicating land ownership between the two tribes. Therefore, Congress passed legislation to allow the two tribes to file suit over the land. In supporting the congressional action to grant permission for the tribes to sue each other, Congressman Owens (1974) reassured members of Congress that the suit would be a simple quitclaim transaction.

No one expected that this bill, once enacted, would bring about additional litigation and a costly settlement. Today, these policies and related developments continue to wreak hardship on the lives of Navajo families caught in the web of the land dispute.

In September 1962, when federal courts ruled in favor of the Hopi in *Healing v. Jones*, the attorney for the Navajo tribe filed an appeal to the 9th Circuit Court of Appeals. The Appellate Court upheld the decision and ruled that (1) District Six land is for the exclusive use of the Hopi, and (2) both tribes have an undivided and equal interest in the remaining 1882 land, thereafter dubbed the "Joint Use Area" (JUA) (*Healing v. Jones* 210 F. Supp. 125).
The aftermath of the decision set off a flurry of political activities in the nation's capitol. Four major bills were introduced in Congress in 1972, all dealing with issues of the Navajo-Hopi land dispute. A series of congressional hearings were held on some of the proposed bills against a backdrop of a media blitz in print and cartoons that portrayed the Navajo as an aggressive tribe that was overpowering a defenseless opponent (Tibbets 1988).

The influence of the media blitz was also apparent in Congress as Sam Steiger, a congressional representative from Arizona, introduced a bill to partition the land that was to be used jointly by both tribes, the Joint Use Area (JUA). On the floor of Congress, Congressman Wayne Aspinall of Colorado supported the partitioning the land and defended his position with statements such as: "Gentlemen, people are being killed everyday in the land dispute" (Casteel 1973:5). Although no one had been killed over the land dispute, congressional posturing were charged with emotion and accusations that the Navajo were killing Hopi over the land division.

Despite lobbying efforts against the partitioning of the land by the Navajo delegates, who were joined by some Hopi traditional religious leaders, Congress enacted Public Law 93-531 on December 22, 1974, calling for an equal division of the JUA and including a provision that would impose a construction freeze and increase the livestock reduction in the former JUA. Other portions of the Act established a relocation agency (Navajo-Hopi Indian Relocation Commission) to carry out the removal and resettlement of families. The deadline stipulated by Congress for the completion of relocation was set for July 7, 1986.

In April 1979, the Federal District Court issued the Final Judgment of Partition (Office of Navajo and Hopi Indian Relocation [ONHIR] 1995). The 1974 Settlement Act was amended a number of times—such as in 1980 (P.L. 96-305), in 1985 (P.L. 99-190), and in 1988 (P.L. 100-666)—to deal with a series of unexpected problems that hindered relocation. Some of the revisions called for securing resettlement land for Navajo who were displaced, although this action was delayed by a number of barriers that prevented securing suitable resettlement land. For example, the Settlement Act asked for the Navajo Tribe to acquire up to 400,000 acres for resettlement. However, in the 1980 amendment, Congress placed boundary restrictions on the land that could be used for resettlement. This amendment followed the strong opposition of a number of non-Indians to the sites proposed for resettlement.

In time, the Bureau of Land Management was able to negotiate a special BLM/private land exchange of 379,000 acres in Arizona and 35,000 acres in New Mexico for resettlement areas. The land purchased in Arizona for resettlement is located near Sanders, Arizona, and is referred to as "New Lands."

The congressional and Federal Court actions on the Settlement Act targeted removal of approximately 3,495 Navajo and 40 Hopi (figures given in 1977 by the first Federal Mediator, William E. Simkin) and has been described as the largest mandatory relocation of civilians since the internment of Japanese-Americans during World War II (Whitson 1985).

The most recent report from the federal ONHIR (1998) indicates that, as of December
1997, a total of 2,923 families, including 25 Hopi families, have been relocated, and 528 are yet to be relocated. Of those relocated, 63 percent have been relocated in Reservation communities, and all of those awaiting relocation are Navajo. Ninety-nine percent of the families relocated are Navajo.

**HARDROCK AND THE RELOCATION EXPERIENCE**

Hardrock, or Tse’dil doi’ii (hard rocks), is the site of the Hardrock Chapter headquarters and is located approximately 13 mi northeast of Kykotsmovi (the administrative headquarters for the Hopi reservation) and approximately 125 mi west of Window Rock, the capitol of the Navajo Nation. The Hardrock Chapter land is therefore located in the northeast corner of Arizona, in the western portion of the Navajo reservation, in the former Joint Use Area (JUA). As with a county, the boundaries of the Hardrock Chapter land encompass a number of rural settlements, including Mosquito Springs, Dinnebito, and Big Mountain (Dzil Ntsaa), etc.

Hardrock is one of 11 Navajo Chapter areas affected by the land partition. Compared to the other chapters, however, Hardrock lost more land. For example, the Hardrock Chapter lost two-thirds of the 400 sq mi as a result of the partition (CH2M Hill 1984:2-1), and more families were subject to relocation than any other chapters. In addition, 21 percent of the 9,244 potential relocatees identified by the Relocation Commission in 1981 live within the boundaries of the Hardrock Chapter.

**THE STUDY**

This study follows the impact of relocation on the community of the Hardrock Chapter. The study was initiated in 1980, six years after the passage of the Navajo-Hopi Indian Settlement Act (Public Law 93–531), three years after the first family relocated from the community of Hardrock Chapter to Flagstaff, and a year after the final partition line was drawn. The project therefore began at the height of community unrest, which was fueled by government programs that led to fencing and livestock impoundments and by stress over a number of proposed political solutions. In short, losing the land had suddenly become a reality, as workmen started fencing the partition line. The workmen building the fence became the first visible evidence of what was to come. Until the fence crew came onto the land, most residents had had little opportunity to vent their anger or frustration because, as one commented: "We had to deal with faceless entities called 'the government' and/or 'the courts.'"

It is quite understandable, therefore, why one Hardrock Chapter resident threatened the foreman of one work crew with a shovel after she found them fencing her land (Navajo Times 1977). She was charged and jailed, but the charges were later dropped. In 1980, when this study began, the above example was one of many reactions to the impending forced relocation.

**The Community Sample**

In 1980, 300 heads of households were surveyed in the Hardrock Chapter communities. The 1980 census placed the total population of Hardrock Chapter (not including those whose lands were partitioned to the
Hopi) at 1,220 (Division of Community Development [DCD] 1990). To ensure that all strata of the community were included in the interviews, the first wave of interviews was with respondents over age 50 and the last group was with heads of households around age 20.

In the 1980 study, 61 percent of the 300 heads of households interviewed were subject to relocation. Of the 61 percent subject to removal, 49 percent of the group was adamant about not moving (the Resisters), and the remaining 51 percent was ambivalent (the Ambivalents); in other words, they did not want to move, but would probably move eventually.

From this baseline sample of 300, a random subsample of 90 respondents and their families were selected to be followed, prospectively. Between 1981 and 1984, and again in 1994, the subsample was reinterviewed, and, wherever possible, one or more children (between ages of 10 and 18 in 1980) were also interviewed.

The Changing Demographics of Hardrock Chapter

The 1990 census places the population of Hardrock Chapter at 1,065, which is a decrease from 1,220 in 1980 (DCD 1993). The 1990 population figures, however, do not include the 597 Hardrock residents who still reside on lands partitioned to the Hopi (DCD 1993). Moreover, in 1990, the average age of the 1,065 Hardrock residents was 27.2 years, with 40 percent under age 18. The average household size in 1990 was 4.5 (DCD 1993), compared to 5.7 in 1980 among the study sample of 300.

In the 1980 sample, 44 percent of the 300 respondents had no formal schooling, and 21 percent had less than a fifth-grade education. Only 9 percent of the respondents were employed, but 56 percent of the sample were also out of the work force as a result of a disability, old age, and/or because they lacked job skills. The annual per capita income for these families in 1979 was $799, an increase of $41 from the $758 per capita income reported for this area in the U.S. Census in 1970 (Joe 1982, 1985).

These conditions and the lack of jobs in the community kept a high percentage of the families on public assistance, especially welfare and social security. For example, 60 percent of the 300 households surveyed in 1980 were on public assistance, and 10 percent had no income (Joe 1982). Goy (1992) also reported that 45 percent of the 336 families in Hardrock were on public assistance, and 22 percent reported no income in 1992.

Poverty in Hardrock Chapter remains unchanged and endemic. For example, according to the 1990 census, the average family income for the entire Navajo Nation was $11,885, significantly higher than the average annual income of $5,800 reported by 67 percent of the 336 heads of households interviewed by Chapter officials in Hardrock in 1991–1992 (DCD 1993; Goy 1992).

The 1992 situation indicates that while the number of persons on public assistance may have decreased slightly, the number of those with no income has increased. Poverty is evident for the other regions of the Navajo Reservation; for example, the 1990 census also reported that 57.4 percent of the Navajo families on the reservation, compared to 10
percent of the U.S. population (all races), had incomes below the poverty level in 1989 (DCD 1995).

As a result of the prolonged enforced stock reduction, the size of herds owned by Hardrock families has also been greatly reduced. For example, 79 percent of the 300 households in 1980 reported having some sheep and goats, but the average was less than 15 animals per household compared to an average of 30 for households in the reservation community of Navajo Mountain (Joe 1985).

In 1980, 55 percent of the 350 Hardrock heads of household interviewed listed traditional Navajo religion or the Native American Church central to their religious practices. Not surprising then, the use of traditional healers was significant, particularly for those family members whose mental and/or physical health were impacted by the impending relocation.

Fourteen Years Later

By 1992, one of the most visible change in Hardrock Chapter was that over 52 percent of 336 Hardrock families within the Chapter boundaries were now Relocatees (Goy 1992). Most of these Relocatees relocated from within the former boundaries of the Hardrock Chapter, areas that are now partitioned to the Hopi Reservation. These families sought permission from the Hardrock Chapter officials to lease a 1-acre home site. Unlike families that relocated to the New Lands, which included grazing land, these Hardrock Chapter relocatees not only lost their sizable grazing land but now also limit their land use to their 1-acre homesites.

The other noticeable change in this rural community is that most of the new houses built for the relocatees are clustered together, which is not in keeping with the usual Navajo settlement pattern that placed extended kin close together but not close to nonrelatives. Needless to say, the influx of new housing and the resettlement of families in the Hardrock community is contributing to the overpopulation of the area, which has resulted in increased competition for the limited grazing land and water.

One other visible change in the area is the presence of cement foundations being poured for a new Hopi housing project, a project that is located within 1 mi of the Hardrock Chapter building. These new housing projects in the former Navajo land-use area are part of an effort by the Hopi tribal government to encourage young Hopi families to settle in the former JUA.

Besides visible changes in the landscape, there are also changes for the families. For example, when the attempt was made in 1994 to reinterview all of the original subsample of 90 heads of household, only 83 were located. The difference is three of the former respondents who were deceased, one respondent who refused to be interviewed again, and three who had been relocated outside Hardrock Chapter.

Sixty-three percent of the 83 heads of households reinterviewed were female. The average age of these respondents was 47.5 years in 1980; in 1994, it was 63.7 years. As mentioned earlier, all of the 300 families interviewed in 1980 were typed according to whether they were subject to relocation and, if subject to relocation, how they were responding to the impending relocation.
Among the latter, two types were identified—those who said they would resist the move (the Resisters) and those who were ambivalent (the Ambivalents) about moving but thought they would eventually move. The other two groups consisted of those who had already moved (the Relocatees) and/or those who were not subject to relocation (the Nonmovers). Table 1 summarizes the changes from 1984 to 1994 among the original four family types.

Table 1. Percentages of Family Types in 1984 and 1994.

<table>
<thead>
<tr>
<th>Type</th>
<th>1984</th>
<th>1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambivalent</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>Resister</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Relocated</td>
<td>20</td>
<td>53</td>
</tr>
<tr>
<td>Nonmovers</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>%</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>N</td>
<td>83</td>
<td>83</td>
</tr>
</tbody>
</table>

As can be seen, many of those who were ambivalent and/or resisting the move in 1980 had relocated by 1994. For example, all of the potential Relocatees who were ambivalent about moving in 1980 were relocated by 1994, and half of the 24 families who had resisted the move in 1980 had also relocated (most were resettled in Hardrock). The number of families who did not have to move (the Nonmovers) did not change.

It should also be noted that, compared to the late 1970s and early 1980s, during which Navajo families were relocated to towns off the reservation, a majority of the Hardrock Relocatees had relocated within the boundaries of the Navajo reservation, in or near Hardrock Chapter. In addition, five of the Relocatees (who had relocated to nearby towns) lost their relocation homes and were now living with relatives back in Hardrock.

Although many of these families indicated they were not going to be relocated in 1980, some of those who had relocated said they moved in order to alleviate uncertainty and the constant stress. Others said they became more willing to move when they obtained a homesite on land in Hardrock Chapter and/or elected to move when they were given an opportunity to move as a unit with other extended family members in a relocation option called “group move.” Table 2 notes the choices for resettlement sites.

Table 2. Percent of Resettlement Type (n=53).6

<table>
<thead>
<tr>
<th>Type</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservation Homesite Lease</td>
<td>45</td>
</tr>
<tr>
<td>Border Town</td>
<td>21</td>
</tr>
<tr>
<td>Reservation Group Move</td>
<td>17</td>
</tr>
<tr>
<td>New Lands</td>
<td>17</td>
</tr>
<tr>
<td>Totals</td>
<td>100</td>
</tr>
</tbody>
</table>

In this sample, a majority of the families who were ambivalent about moving were relocated between 1980 and 1985, after homesite leases and group-move options were introduced by the Relocation Commission. As Table 2 illustrates, 75 percent of the relocated families selected one or the other of these two options, including some families who had resisted relocation in 1980. Those who relocated to off-reservation border towns also selected sites close to the reservation. It should also be noted that some former Hardrock residents who have relocated to the New Lands were not reinterviewed and
therefore are not among the Relocatees presented in the update.

In the follow-up study, there was also a noticeable change in the marital status of the respondents, primarily as a result of mortality. For example, the number of those widowed or who were widows increased from 9 percent in 1980 to 22 percent in 1994. The marital status for a number of other respondents also changed over the 14-year period, mainly through dissolution of marriage by divorce or separation, or as mentioned, by the death of a spouse. It should also be noted that 8 of the 10 spouses who died after 1982 were Relocatees.

According to death certificates, the leading causes of these post-1982 deaths were (in descending order): 3 from heart attacks, 2 accidents, 2 chronic diseases, 1 cancer, 1 natural causes, and 1 from unknown causes. A couple of survivors (spouse of a person who had died of a heart attack) said that the spouse’s death was hastened by the stress and worry over relocation.

Because of aging, there was also an increase in the number of individuals with a variety of chronic health problems, such as diabetes, arthritis, etc. In addition to physical health, the mental-health status of some of the respondents had improved in 1994, at least at the time of 1994 interview. The mental-health status was measured by the Health Opinion Survey (HOS), a self-reported mental-health instrument. Table 3 compares the percent with poor mental health in 1984 and in 1994 by family types.

<table>
<thead>
<tr>
<th>Family Type</th>
<th>Poor 1984</th>
<th>Good 1984</th>
<th>Poor 1994</th>
<th>Good 1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambivalents</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>*60</td>
</tr>
<tr>
<td>Resisters</td>
<td>80</td>
<td>20</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Nonmovers</td>
<td>62</td>
<td>38</td>
<td>68</td>
<td>32</td>
</tr>
<tr>
<td>Relocatees</td>
<td>86</td>
<td>14</td>
<td>79</td>
<td>21</td>
</tr>
</tbody>
</table>

* Ambivalent families were all relocated by 1994.

The mental-health status among some of the relocatees had improved somewhat, perhaps because they were now relocated and no longer had to deal with the uncertainties of relocation. The same was true for those who continue to resist relocation. The mental-health status of the Nonmovers, however, had worsened somewhat, although the reasons for the decline are not clear. There was, however, at the time of the 1994 interviews, reports of more intracommunity conflicts over scarce resources, especially grazing land, water, and firewood. There was also some resentment against the Relocatees, who had new houses, while the dwellings of the Nonmovers remained neglected.

Besides the utilization of physicians and clinics for health problems, families in Hardrock also secure help for physical and psychological ailments through the use of traditional resources, such as chanters, Native American Church Roadman, etc. Most Hardrock residents utilize both modern medicine and traditional ceremonies, but the utilization of traditional healers varies from family to family. Table 4 provides data comparing the total number of healing ceremonies conducted for family members the previous year in 1984 and 1994.
Table 4. Average Number of Healing Ceremonies by Family Types in 1984 and 1994.

<table>
<thead>
<tr>
<th>Family Type</th>
<th>1984</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambivalent</td>
<td>4</td>
<td>*1.5</td>
</tr>
<tr>
<td>Resisters</td>
<td>5.3</td>
<td>6.9</td>
</tr>
<tr>
<td>Nonmovers</td>
<td>5.3</td>
<td>2.8</td>
</tr>
<tr>
<td>Relocatees</td>
<td>6.7</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>83</td>
<td>83</td>
</tr>
</tbody>
</table>

* Have all relocated by 1994.

Except for families who continue to resist relocation, most of the other families reported fewer healing ceremonies or use of traditional healers. When one respondent (who is resisting relocation) was asked about major reasons for his family’s need for healing ceremonies, he replied, “Everyone else has forgotten us, except our chanters (traditional healers).” Despite intragroup differences in utilizing healers, it is important to note that 90 percent of this sample utilize traditional healers and/or the services of the Native American Church Roadman.

Other respondents explain that economic hardship (low income and no livestock) limit their use of traditional healers. Relocatees, in particular, are more likely to own no livestock, a resource often used to help defray the cost of healing ceremonies. In addition, the cost of most materials, especially baskets, buckskin, etc., required for healing ceremonies are frequently priced out of the reach of most Hardrock families.

Another factor that affects low use of traditional healing ceremonies is the low number of healers. Mortality and retirement have decreased the number of Chanters or other medicine people. For Hardrock, the decrease in the number of traditional healers is also related to relocation—a number of the healers have been relocated out of the community (Joe 1985). The shortage of traditional healers, however, is not unique to Hardrock. The entire Reservation is experiencing a shortage.

Strong adherence to Navajo tradition is also evidenced in the value these families place on livestock. As stated earlier, the economic self-sufficiency of the community has been severely undermined by the government’s mandatory livestock reduction. Except for the families who have moved to New Lands, most Hardrock relocatees are not allowed to increase their herds.

The lack of herds has greatly impacted the weavers in the community. With no livestock, the weavers are not only unable to teach weaving to their daughters but also must buy commercial wool, creating a hardship, because commercial wool rugs bring weavers little profit. Navajo rug dealers and/or collectors do not demand these rugs.

With the imposed livestock reduction and the limited employment in the community, many Hardrock families have had to turn elsewhere for economic survival. In general, this has meant a growing dependency on public assistance. The number of families on public assistance, indicated in Table 5, reflects a situation that has remained essentially unchanged.

Of the three family groups, the Resisters (who have been pushed into severe poverty by relocation) have more families on public assistance than Nonmovers and Relocatees. In addition to those on welfare, many other
residents, because of their disability or age, also depend on Social Security benefits.


<table>
<thead>
<tr>
<th>Source</th>
<th>1984</th>
<th>1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Assistance</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Wages</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>No Income</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Retirement Pension</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total %</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total N</td>
<td>83</td>
<td>83</td>
</tr>
</tbody>
</table>

Regardless of the source of income, the majority of the Hardrock residents receive less than $500 a month. And as noted elsewhere, the average monthly family income in 1992 ranged from $202 to $574 (Goy 1992).

According to the 1990 census, 25 percent (or 12,093) of the Navajo Reservation population in 1989 was on public assistance (DCD 1995). The annual income for those on public assistance was $3,543.

Since the early 1980s, the economic situation for many families in the community of Hardrock has worsened, despite the fact that some citizens no longer have to worry about forced removal. Without public assistance, the situation would have been disastrous.

SUMMARY COMMENTS

The aftermath of Healing v. Jones and other federal policies that followed changed not only the lives of Navajo families who were relocated but also those who did not have to move. In the Hardrock Chapter, the Nonmovers made room for many of the Relocatees, despite the decreased land size that offered fewer resources and became more fragile as a result of overpopulation.

The relocation agency has committed more resources to improving the environment for families resettled on New Lands, such as a new school, paved roads to the houses, a new Chapter building, and attempts at developing employment. The reservation relocation sites such as Hardrock, however, have received virtually no benefit beyond new houses constructed for Relocatees. These modern houses, although only a few have electricity or indoor plumbing, visibly remind the Nonmovers that their dilapidated housing is not a priority to anyone. In fact, the host community of Hardrock has gained little for their generosity in sharing their land and its limited resources.

The economic devastation that came with relocation has yet to be turned around. The consequences of chronic high unemployment has caused many young people to leave the reservation. Unfortunately, many of those who stay are finding unhealthy ways to spend their time, such as drinking or abusing drugs (Joe 1997). Because of poverty, families are limited in their ability to seek resources that would help them cope with everyday problems, as well as other dehabilitating health problems. Unfortunately, the federal government created these problems but appears to be concerned with finishing the relocation and not the impact the relocation has had on reservation communities such as the Hardrock Chapter.

In the concluding section of his book, Brugge (1994:156) reiterates that prejudice was an important factor in the outcome of the
land dispute; it provided those with hidden agendas to sway public opinion as well as to use it to rationalize their action. With the rationalization, Brugge (1994:256) states, those with the hidden agendas could ignore the consequences as well as the suffering. The Hardrock families who have been dispossessed, displaced, and relocated within the boundaries of the Hardrock Chapter are suffering, but they are forgotten.

END NOTES

1 Named after the presiding tribal chairman of the respective tribes at the time of the law suit.

2 The partition of the land also uprooted and relocated about 20 Hopi families.

3 Schifter and West (1974:85) note that the “other Indian” was standard language in Executive Orders, but it did not use this phase when the government wanted to reserve land for only one tribe.

4 The study was supported at various phases by the National Institute on Mental Health (MJ 34018), the Rockefeller Foundation, and the Katrin H. Lamon Fellowship.

5 Livestock found on the land partitioned to the Hopi Tribe were impounded by the Hopi Tribe and owners were fined.

6 Includes those families who had moved prior to the start of the study as well as during and after 1984.

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Many archaeologists and other scholars have accepted the idea that the Navajo and Apache (hereafter called the Apachean) migrated from the north into the southwestern United States around A.D. 1500 (for example, Wilcox 1981:213). This idea is based on linguistic studies and on the supposed lack of any earlier archaeological sites with material culture that archaeologists recognize as Apachean. To connect the archaeological and linguistic findings that undergird the conventional idea of early Apachean history, many scholars have assumed that a speech community, an endogamous community, and the users of distinctive material culture are all the same people in one neat self-contained package that is also stable for a long time. Today, many anthropologists are questioning this assumption (Bateman et al. 1990; Moore and Romney 1994; Welsh and Terrell 1994).

When one gets rid of this assumption, the conventional idea about early Apachean history falls apart. Furthermore, the findings that are the basis of the conventional idea are ambiguous. About the conventional linguistic—glottochronological—reconstruction of Apachean “origins,” we need only say that archaeologists have used glottochronological dates uncritically. Such dates, according to Young (1983:393), “are theoretical constructs with a complex relation to actual prehistoric interruptions of communication; they are used by some comparative linguists to give rough estimates of linguistic prehistory.” The rest of this paper sketches some of the archaeological ambiguities and how they relate to Navajo tradition. We honor Dave Brugge for his insights.

AMBIGUOUS ARCHAEOLOGICAL EVIDENCE

The archaeological record contains dwellings, pottery, and other material culture, such as those recorded among the Apachean in the last 500 years. Associated chronometric dates tend to be later than the 1500s. Until very recently, even meticulous archaeologists, such as those to be discussed here, tended to disregard pre-1500s dates from sites with material culture they recognized as Apachean.

For example, Dabney Ford (1979) excavated a site in the middle of Dinetah, which encompasses the upper San Juan and Chama River drainages of northwestern New Mexico where the Navajo settled densely by early Spanish colonial times. Appended is the following analysis of dates from three hogan wood samples by William J. Robinson of the
Laboratory of Tree-ring Research, University of Arizona:

The numbers [dates of 1190vv1, 1209v++vv, and 1289vv] may shock you, but let me explain what I think is going on...none of the samples, including the one with the latest date, have any sapwood left. This means simply that the sapwood has been eroded and the death date of the tree is some years later than the latest date. How many years is hard, again, to prove. It is not unusual for a juniper to have 100 to 150 sapwood rings. Thus I am going to guess that the tree died about A.D. 1400. Since it was then over 500 years old [inside rings dated 0972fp, 0852+, and 1072fp], I further guess that the tree died a natural death and was later incorporated in the hogan. When I can’t say.

The alternative explanations are that your site is actually as early as ca. 1400, which I don’t believe, or that we are dealing with wood reused from an Anasazi context, which also seems a bit far-fetched.

Whatever the case, we have a real paradox.

Nearby was another anomaly, a deposit of twenty-eight sherds, all from the same vessel, in an active arroyo bottom 24 meters northeast of Hogan II [which Ford says elsewhere was probably a ramada rather than a true hogan like Hogan I, which produced the tree-ring samples]...They are identified as Rosa Smoothed, a local Basketmaker III-PI [A.D. 700–900] utility ware common in the Largo-Gobernador drainages....

Were it not for the fact that Rosa Gray and Dineta Utility (an early Navajo ware) are notoriously similar, nothing more would be said about the sherds. [Ford 1979:11]

But, because of this problem, Ford scrupulously compares several different attributes of the sherds with type descriptions for Rosa Smoothed and Dineta Utility. Still, the sherds are found where Navajo custom would direct occupants of “Hogan II” to return a broken pot to the earth, a coincidence that today would beg for thermoluminescence dating of the sherds themselves.

McKenna (1987) illustrates how archaeologists conventionally interpret sets of radiocarbon dates that seem anomalously early for Navajo sites. At the Sand Dune Site, Ganado, remains of a possible burned hogan (Feature 3) are part of a cluster of features. The cluster also includes a Precolumbian structure and ceramic types conventionally dated to the A.D. 900s and 1275–1300.

Radiocarbon dates...all concentrate in the Feature 3 complex....The dates initially appear to indicate an early historic component, but one that predates the known, historic occupation at the site. [McKenna 1987:8]

What McKenna considers the “known, historic component” is used by a Navajo leader (Ji#haalii) in the late 1700s—he is mentioned in several Navajo interviews with Brugge (1985). McKenna ignores the one interview that also seems to have identified the 1700s leader with individuals from earlier times, thereby hinting at the earlier “historic component” of the 14C dates.

...these dates might ordinarily be rejected, but their consistency suggests they form populations worthy of interpretation. The distribution of these dates suggest that two populations exist....[McKenna 1987:8]

Statistically, the four samples fall into two separate clusters: one consisting of the 1700s
floor specimen and the other consisting of the other three specimens, whose averaged tree-ring calibrated dates span a 95 percent confidence interval of A.D. 1407-1563 (averaged uncalibrated radiocarbon date is A.D. 1522±32).

These dates are probably more informative of wood use than in pinpointing different occupations. The A.D. 1730 radiocarbon date [floor specimen] may represent the possible use of fresh cut wood in some construction element of Feature 3. The earlier dates, all coming from firepits or possible firepits, suggest the use of gathered, dead wood for fuel. The calibrated [radiocarbon] A.D. 1548 date from Feature 3B (posthole?) is somewhat ambiguous. The identification of this feature is not certain—it may be a firepit. Conversely, the use of dead wood in Navajo construction is not unheard of...and if this sample represents the use of dead wood in construction such wood might be expected to be sounder (younger?) than dead material routinely selected for fuel. Although several interpretations of the radiocarbon dates may be offered, all the samples appear related to the late eighteenth century Navajo occupation and cannot be categorically dismissed as "bad dates." [McKenna 1987:8–9]

McKenna offers two choices: the 1400s–1500s dates are bad or they reflect use of wood 250–300 years old for both construction and fuel.

Interpreters of such dates from structural wood (e.g., Brown 1996:56) need to consider Navajo wood-use customs reported by Brugge and his colleagues way back in the Navajo Land Claims Research of the 1950s–1960s:

A span of dates over a number of years, in terms of Navajo culture, indicates either a long, continuous occupation or recurrent use with repairs or rebuilding. Tree-ring dates from Navajo hogans or sites rarely cluster within a few years of one another....There are several possible interpretations applicable to tree-ring dates from a hogan or site which spread over a number of years:

a. Construction was about the time of the earliest date in the series, the later dates representing repairs.

b. Later dates represent the building date and the earlier dates represent timbers reused from a former hogan, or a rebuilding of the original structure. Reuse of poles inherited within a family sometimes accounts for spans of 100 years or more in dates.

c. If the dates are from different structures on the site, they may represent the addition of hogans to the already existing site [as daughters grow up, marry, and add their own hogans to the parental homesite]....

d. The latest dates from a series may represent a reoccupation of the site with repairs or rebuilding....

e. In a few instances, a date may be obtained which is a variant from the majority in the series. A variant date, usually substantially earlier than the others in the series, may or may not represent the use of a dead timber. Navajos occasionally utilized a sound standing dead timber, if live timber was not available, but this was not the common practice....Because of Navajo superstitions concerning the use of timbers struck by lightning or otherwise rendered taboo, they were reluctant to utilize "any wood that I don't know anything about, that has been laying around." [Navajo Nation circa 1963: 762–765]
Recent archaeological excavations at several sites in northwestern New Mexico with Navajo pottery have yielded dates as early as the 1300s. Brown (1996:56) believes these dates indicate use of the sites by A.D. 1500 but not necessarily earlier. These dates are the result of several techniques (thermoluminescence, radiocarbon, obsidian hydration) that do not perfectly corroborate each other. Archaeologists seem uncertain about what factors can skew the dates produced by each technique, so interpreting these dates is also uncertain (Towner 1996). The one certainty is that we need more sets of dates for various materials from sites of all types and systematic hypothesis-testing about why the dates differ. As archaeologists apply new dating methods (and refine interpreting these dates) to sites with distinctive Apachean material culture, and as every boom in oil, gas, and coal exploration brings more such sites to light, even earlier dates emerge (see examples in Towner 1996). Of special note is a campsite with dates from a hearth and a Diné Gray ware jar between 1200 and 1400 (Brown 1996:65).

The new discoveries (and reassessments of other dates such as those described here) also narrow the gap between the “earliest Navajo” pottery and the Navajo-like pottery on Gallina sites of the 1100s–1300s. The Gallina sites are near the new discoveries in an area densely settled by Navajo in Spanish colonial times. Cordell (1979:142) describes the Gallina sites:

There is general agreement that the Gallina phase developed out of the Pueblo I groups in the Gobernador [including the Rosa of 700–900]..., but a temporal gap separates the two. The Gallina phase has been characterized as one of relative isolation because of a lack of evidence of much trade or interaction with Mesa Verde or Chaco Canyon.

These sites consist of clusters of pithouses and small surface structures; a few sites have towers. The pointed-bottom pots of these sites “are not a characteristically Anasazi trait, and it has been suggested that they represent contact with Plains or Woodland groups.” (Cordell also does not mention that archaeologists first attributed these sites to the Navajo because of their Navajo-like pottery [see Wilcox 1981:215]). Cordell (1979:143) continues that the pottery may indicate “a functional adaptation in increased cooking or storage efficiency encouraged by climatic deterioration,” and “a link between the Gallina sites and the protohistoric and historic sites of Jemez, including modern Jemez Pueblo...on the basis of floor features and room configuration...is generally accepted.”

Here, without explicit justification, a normally skeptical archaeologist ignores certain similarities to modern Navajo material culture in favor of other similarities to the material culture of a modern Puebloan group. (In a later work, Cordell [1984:357] mentions, without endorsing, a possible Apachean connection.) Since material culture supports a possible Apachean connection, as well as a Jemez one, why does Cordell ignore the Apachean possibility? Especially since the entanglements of Navajo and Jemez peoples make connection of both groups to Gallina worth studying. The Navajo were ancestors of more than half the late 1800s Jemez Pueblo people, according to Adolph Bandelier (cited in Van Valkenburgh 1941:80).

“ABSENT” ARCHAEOLOGICAL EVIDENCE

But, regardless of how one interprets the dates of these items and their relations to the Navajo and other Apachean, why assume that forebears of today’s Navajo had pottery or house forms like more recent types? Why
assume that all Navajo forebears had the same type of house form and pottery? Pushing back the date of the earliest Navajo-like ceramics and house forms by a century or so does not establish that the people who made them had just “arrived.” Opler (1983:381–382), Cordell (1984:358), and Brown (1996:64–69) find that recognizably Apachean archaeological remains (such as Navajo forked-stick hogans) may be adapted to local conditions and therefore may not be the earliest Apachean remains. Those are more likely to be the sparse and generic leavings of hunter-gatherers (as the Apacheans are assumed to have been when they “entered the Southwest”).

If migrating people could be counted on to leave a trail with an unchanging type of house or pottery, and if the pattern of divergence among the Athabaskan languages also tracked the movements of people, archaeologists would have found the migration route somewhere in the archaeological record of the western United States. Absence of evidence may not be evidence of absence, but after almost half a century of looking for evidence of migration, they have not found anything they can agree on (Cordell 1984:358). One reason that archaeological remains do not mark out an obvious trail of migration may be that an entire community migrating into the territory of another (reflected by the “site unit intrusion”) is relatively rare ethnographically. More commonly, individuals and family groups follow separate migration paths, integrating themselves into ongoing communities where they have kinship or friendship ties.... Archaeologically, this form of migration would be visible primarily as a regional increase in population (Cordell 1984:333–334).

The conventional archaeological story about the Precolumbian Southwest also says that, before the Apachean, the Apachean homeland on the Colorado Plateau was the home of the prehistoric “Anasazis.” (Because of its various connotations, we avoid this name hereafter and substitute “Precolumbians” of specified time and place.) Archaeologists long thought that these Precolumbians abandoned most of the Colorado Plateau around A.D. 1300. Drought and erosion have been the most popular recent explanations. (Before archaeologists got hold of the glotto-chronological reconstruction of Athabaskan language fissioning and used it as a metaphor for migration, however, many proposed an Apachean invasion as the cause.)

Today, archaeologists suggest that Precolumbians from the central Colorado Plateau scattered to various other places, including southern Black Mesa and the Rio Grande Valley, where archaeological evidence suggests that population grew after A.D. 1300. The people already living in these places absorbed the central Colorado Plateau Precolumbians (as well as other people moving in from elsewhere) to become the various Indian (Pueblo) villages that the Spaniards encountered. Archaeologists today still believe that people around A.D. 1300 reduced their use of much of the Colorado Plateau. But they are abandoning their scholarly predecessors’ notion of a wholesale Precolumbian abandonment. Some archaeologists now suggest that some people did stay in the central Colorado Plateau after A.D. 1300 (Cordell 1984:304–361). Most archaeologists still assume, however, that the only descendants of the “Anasazi” are the post-contact Pueblo Indians.

The highly organized systems of the Chacoan San Juan [and elsewhere]... seem not to have been able to maintain themselves...
structurally or energetically. Initially, there is the appearance of population decline, but the situation may have been one of decentralization, reduced coordination of labor, and changes in village layout. Some trade networks, albeit fragmented, were maintained.

Abandonment of the central San Juan Basin [and elsewhere]...coincides with population increases in surrounding and upland regions. These movements coincide with a temporary shift from intensive agricultural production to more hunting and gathering and less-intensive agriculture. Within only a short period of time, however, much of the Southwest was once again incorporated within regionally organized systems. These systems were different from those of the A.D. 1100s and 1200s. [Cordell, 1984:325]

Large villages then appeared in “parts of the Southwest...formerly...thinline populated” (Cordell 1984:328). Cordell adds that families probably emigrated atomistically as described in the quotation above, so one cannot connect post-1300 aggregated sites of the Rio Grande or western Pueblos with communities in areas that were populous before 1300 (Cordell 1984:333–334).

Brugge (1989:1) suggests that Apachean then moved into the depopulated central Colorado Plateau:

[The Apachean] must have arrived in the regions abandoned by the Anasazi and their neighbors within a century of the [c. 1300] withdrawal of the prehistoric agriculturists or their occupation would have been prevented by others getting there first....

I do not mean to imply that one people cannot displace another, but I believe that except in the face of catastrophic events such as ecological disasters, arrival of deadly pathogens or intrusion of technologically more complex societies, replacement is rare and ethnic continuity the norm.

**NAVAJO TRADITION**

Regardless of when archaeologists and other scholars think that the ancestral Apachean first appeared in the Southwest and where they originated, Navajo stories of ceremonial origins refer early and often to landscapes remote and accessible all over the Colorado Plateau at a time without domesticated animals and non-Indians, when the great ruins that antedate A.D. 1300 were still in use—in other words, Precolumbian times. Brugge (1992:33) describes these stories:

Taken literally, the sacred traditions would indicate that the Navajos’ ancestors were living in close association with the Anasazi, that their homes and camps were intermingled with the settlements of the village dwellers, and that their wanderings took them throughout the country among the various Anasazi centers.

The most curious aspect of the distribution of places named in the sacred texts is that they seem to concentrate at the old Anasazi centers, Mesa Verde and Mancos Canyon, Canyon de Chelly, the Hopi Mesas, Aztec Ruins, and Chaco Canyon in particular....

There are various ways of regarding these texts....The most straightforward view is that they describe events in which the Navajo participated, thereby implying an early Navajo arrival in Pueblo country, perhaps as early as A.D. 1000....A less direct view is that these describe the history of
peoples whose ancestors were not Navajo, but who were incorporated into the Navajo Tribe. Two possibilities occur here. I have long favored the idea that the stories were carried to the Navajo by the Pueblo refugees who fled the Spaniards in the 1690s, if not by occasional fugitives who joined the tribe before this date. . . . The other possibility is that the Archaic lifeway persisted throughout Anasazi times and that the stories were transmitted to the Navajo by remnants of this Archaic population, who were absorbed by the Navajo as they entered the region.

We agree with Brugge that the 1690s "Puebloan refugees" might be one source of these stories. But we also offer an additional possibility that Brugge does not mention. Instead of Brugge's "Archaic" people, we suggest Precolumbian hunter-cultivators dispersed in the small (presumably extended family) compounds that are the archaeological background for the pre-1300 "great house" ceremonial complexes. Then came the 1300s–early 1400s transition that Cordell describes—first social decentralization with a simplified way of life and the resulting much-reduced archaeological record, then later generations moving to new centers elsewhere. From the 1400s on, the depopulated areas supported a thin scatter of families whose simple life left archaeological traces easily dismissed as "bad dates" and "old wood"—in a nutshell, early Apachean sites. Some of these families may have been newcomers, others descendants of earlier residents.

We wonder if Apachean speakers before and after 1300 could have been traders who linked the Plains with the Pacific and Gulf of California, as Navajo ceremonial stories hint? In these stories, turquoise, obsidian, marine shell, and buffalo cross the central Colorado Plateau and beyond on routes that match "traditional" (presumably Precolumbian) long-distance trade routes (Ford 1983:719). We suggest that Apachean might have been a lingua franca for such trade. Then, after 1300, this lingua franca became the language of the scattered bands that stayed in the depopulated parts of the central Colorado Plateau. (Apachean would have fragmented into Navajo and other variants as a result of Spanish intrusion.)

Most Navajo we know today accept what their elders have said that Navajo forebears were in Navajoland far back in Precolumbian times. Many Navajo today also acknowledge at least limited connections with "Anasazi" (Kelley and Francis 1994:29, for example). The Navajo stories that Brugge describes above tell about the origins of ceremonies and about Precolumbian life as witnessed by Navajo forebears. These stories were recorded between the 1880s and the present (most were recorded between the 1920s and early 1950s) in English and sometimes also in Navajo, and they represent at least 44 tellers, 66 narratives, and 21 ceremonial repertoires. The list is too long to include here; sources cited to support each statement are only examples. These stories tell that:

— The Navajo people (Dine) originated not far north of their present homeland in the central Colorado Plateau (Fishler 1953:87; Matthews 1897:219 n43). Dine and Kiis'aanii (village Indians) originated together (Stephen 1930:102). The criteria to distinguish Dine from Kiis'aanii are stories that emphasize house form, settlement pattern, and perhaps habitat, proficiency in farming, and hairstyle. The two groups traded and intermarried. Language differences are largely unmentioned (Goddard 1933:24, 133; Matthews 1897:77–78). Dine and Kiis'aanii in these stories embody the symbiotic opposition between "hunters" and "farmers" reportedly basic in
origin stories widespread in the Western Hemisphere (Brotherston 1992:140).

— Events occurred when people still lived at dozens of Precolumbian archaeological sites. The Diné lived outside the large ceremonial centers and interacted with their inhabitants at Chaco Canyon, Mesa Verde, Canyon de Chelly, Tsegi Canyon, Black Mesa, centers south of the Little Colorado River, and elsewhere on the central Colorado Plateau that archaeologists have dated to the 800s-1200s (Fishler 1953; Goddard 1933; Haile 1978; Matthews 1897; O'Bryan 1956; Wheelwright 1958). Certain Diné ceremonies commemorate events at certain Precolumbian ceremonial centers (now archaeological sites) and incorporate certain things that Diné practitioners learned at these sites (Matthews 1897; O’Bryan 1956).

— The people of the central Colorado Plateau, both Diné and Kiis’aanii, were beset by powerful malevolent gods (some perhaps formerly venerated), by natural disasters, and by epidemics, which killed off most of the people (Haile 1981; Matthews 1897). Small groups (Tachi’ii clan forebears [Matthews 1897:145]), survived and stayed in the central Colorado Plateau, later to be joined by people from down the West Coast or Death Valley region. Small bands of isolated wanderers joined a growing network of other bands to form a social fabric of exogamous clans (Fishler 1953:89; Haile 1981; Klah 1942:107-108, 114-122; Matthews 1897:104-159).

— Still later, some Kiis’aanii from the edges of the central Colorado Plateau moved back among the growing population of the Plateau. They joined existing Diné clans or were recognized as clans in their own right (Brugge 1994:8-9; Matthews 1897:63, 104-159; Mitchell 1978:168-191; Preston 1954; Van Valkenburgh 1941:80; see also Benedict 1981:1; Courlander 1971:70-71, 177-184; Yava 1978:36). During this time of clan coalescence, the immortal Changing Woman taught the Diné the Blessingway ceremonies that are the root of “modern” Navajo ceremonialism. One purpose was to keep peace among the people (Mitchell 1978:185-186; Wyman 1970). Brugge (1963) has suggested that Blessingway resulted from a revitalization movement in response to the Puebloan influx after the Reconquest. We suggest that Blessingway integrated the ceremonialism of these people of diverse origins.

Early in this century, Fewkes (1919:262–281) laid out how various clans could have brought certain ceremonial iconography and practices from various archaeological districts to Hopi. We believe that one can generalize this process to all Southwest Indian clans. The histories of different clans start in various regions among various speech communities. Groups of clan members break away and move through a series of places. As they move, they change language, pick up affiliates from clans of their hosts, and move on. The result today is that members of a particular clan and others affiliated with it are spread among various Puebloan, Apachean, and other communities.

CONCLUSIONS

Navajo oral history and its implications are compatible with archaeological findings if, first, one admits the ambiguities of those findings and, more importantly, if one avoids assuming that language, material culture, and ancestry coincide. Navajo scholars Harry Walters (1991) and Clyde Benally (1982) have synthesized anthropology and Navajo oral history in ways similar to what we propose above.
Probably all post-contact Southwest Indian communities, including Apachean groups, incorporate genealogical descendants of both Precolumbian residents of the central Colorado Plateau and other postcolumbian emigrants onto the Plateau. No one modern ethnic group can reasonably claim to be exclusive descendants of the Precolumbians. Those Navajo who acknowledge connections with Anasazi limit the connections to certain specific Navajo clans, specific aspects of Navajo ceremonialism, or specific Precolumbian archaeological sites.

Anthropologists need to quit assuming that societies are normally (or even ever) self-contained, self-sufficient, endogamous communities in which ethnicity, language, and culture coincide and remain stable for a long time. In the real world, ethnic identities, marriage and political networks, and speech communities overlap only partially and therefore perpetually destabilize each other. Each group's encyclopedia of cultural knowledge, as well as the acts by which members pass on this knowledge, also constantly change. Ethnic, linguistic, and cultural boundaries may exist, but networks cross them. Boundaries and networks both create and destabilize each other. Anthropologists need to learn more about how these processes work.

A Navajo story (Wheelwright 1951:8-16) dramatizes these relationships. Around the Precolumbian ceremonial center now called Aztec Ruins, drought hits and people move away. They leave behind a young man. A (totemic?) bear rescues and raises him but cannot overcome her instinct to devour him. He runs away and becomes a Ute. One of his Ute sons is likewise abandoned and raised by a cannibal owl. The son escapes and follows his forebears' trail of abandoned dwellings, pots, and fire-pokers that point back to Mesa Verde. A younger son is also adopted by Utes. Another is captured by the Hopi and recovered by Navajo, whose language tells the story.

— Gallup, New Mexico

END NOTE

fp The curvature of the inside ring indicates that it is far from the pith.

+ One or a few rings may be missing near the outside whose presence or absence cannot be determined because the series does not extend far enough to provide cross-dating.

+++ A ring count is necessary because, beyond a certain point, the specimen could not be counted.

vv There is no way of estimating how far the last ring is from the true outside.

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Navajo rock art has rarely been the subject of serious or intensive study. Currently, emphasis in rock-art studies tends to revolve around the oldest images that therefore are assumed to be the most significant. Early rock-art lends itself more readily to interpretation, a favorite occupation of rock-art researchers, as neither the creators nor their descendants are around to validate or dispute any interpretation.

Carvings and paintings by Navajo are abundant on the rock surfaces of the Southwest. After viewing many such sites, it appears that representational forms are more prevalent than abstract designs. Depictions of people and supernaturals (anthropomorphs) are very common, usually falling into one of three categories: real everyday people, yé’ii or yé’íí bicheii. It appears that there may be a tradition of depicting these subjects in three distinctly different styles with real people depicted realistically, yé’íi depicted in a stylized manner, and yé’íí bicheii depicted in an abstract geometric form. This conclusion was drawn from inspecting sites throughout traditional Navajo tribal lands and especially in Chaco Canyon.

THE HUMAN FIGURE IN NAVAJO ROCK ART, WITH AN EMPHASIS ON MOCKINGBIRD CANYON, CHACO

Jane Kolber

NAVAJO ROCK ART

The study of rock art has overwhelmingly focused on the paintings and carvings produced by artists of cultures that disappeared during prehistoric periods. Little attention has been paid to the petroglyphs and pictographs of cultures that continue to exist in modern times. For example, Rock Art in Arizona devotes less than half a page to Navajo rock art (Thiel 1995:112). I believe that this neglect is the result of the widespread attitude that the oldest is the most important and most interesting.

By studying Navajo rock art, we can set a basis for tracing a unique visual-art tradition that continues today. These rock images are within and reflect a living heritage and therefore provide us with a more accessible understanding and appreciation than can be gained from other extinct cultures.

The general observation of Navajo rock-art sites throughout the Four Corners region has led me to believe that most of it is representational. The most common subjects are humans and animals. Grant (1978:216–217) observed that “With few exceptions, the Navajo paintings are strongly realistic and dynamic as compared with the long Anasazi tradition of static, highly stylized execution.”
Schaafsma (1963:55) also referred to this "greater complexity and dynamic quality," in Navajo rock art.

THE HUMAN FIGURE

Throughout the history of art, the portrayal of the human figure has served as a measure of personal understanding. All cultures make images of themselves unless their religions deny this to them. A study of the human form can lead to a comprehension of methods of expression and technique. Kelly et al. (1972:13), in citing Wyman, stated that "of the Athapascan-speaking peoples of the Southwest, the Navaho have made the most extensive use of the human form in a wide variety of artistic media. Within the highly developed arts of the modern Navaho people, human forms of supernaturals are depicted in numerous sandpaintings...and shown in rugs or sandpainting tapestries and in commercial paintings; and represented by small, three-dimensional carved wood figurines."

One prominent area containing Navajo human images is Chaco Canyon. During the 1970s, the New Mexico Archaeological Society, under the direction of Col. James G. Bain, recorded almost 500 rock-art sites in Chaco Canyon. Many of these sites included Navajo panels that had been very lightly scratched and are rapidly deteriorating. The early recording of Navajo rock art was quite general, with little focus on detail. These early records needed to be augmented to include detailed and comparative observations. In March of 1996, scale drawings were made using string grids in a nonintrusive method where the glyphs are never touched. Also, a new series of black-and-white photographs were made with accompanying notation of data.

The documentation of the Navajo petroglyphs occurred in a side canyon in Chaco Culture National Historical Park. The study area was about .5 mi (.8 km) long. All of the carvings occurred close to the ground at the base of sandstone cliffs, with some situated at the top of talus slopes. A record of 159 elements was produced. Of these, one-eighth are linear designs and one-fourth are animals. The great majority or two-thirds of all the figures appear to be human forms.

STYLISTIC DIFFERENCES IN CHACO CANYON

Of these human forms, or anthropomorphs, in the study area, there are three different distinct types: realistic, stylized, and geometric.

Realistic Forms

The realistic forms predominate. These are often much larger in size than any of the others, but sometimes these forms are just as small or smaller. The average adult human being is approximately 7½ heads high, and the proportions of these realistic forms are truer to actual human proportions than the other forms when comparing the size of the head to the rest of the body. Careful depiction of the clothing and hairstyles is evident, and individual creativity is expressed in style and line. Featured are flowing rhythmic lines and intricate details (Figure 1).

Two-thirds of the realistic human forms are mature women, with the other third being men and female children. The illustrations presumed to be children are based on the smaller size, but occasionally children are accurately portrayed with proportionately larger heads. All but two of the male forms were drawn very cursorily with only a blob for the head, a quickly sketched hat, and a
Figure 1. A panel of women scratched into the sandstone cliff. Notice the child being held by the middle figure and the possible cradle board child of the last opposing figure.

couple of lines to indicate the body (Figure 2). These, as well as the other anthropomorphic figures, are commonly portrayed in a linear sequence of progression indicating motion, which is a frequent characteristic of Navajo rock art (Schaafsma 1963). Most of the groups are underscored by an imagined ground line (Figure 3).

The female forms in these panels are portrayed with utmost care and accuracy. Illustrations of the hair and its dressings are "the most elaborate" that Brugge (personal correspondence 1996) can recall seeing. Skirt patterns are often complicated with radiating lines showing the different tiers. Jewelry is painstakingly defined. Intricate patterns and
Figure 2. The largest woman is about 1 m high, whereas the male stands only 40 cm.
Figure 3. Women and a female child with elaborate hairdos.

details in the clothing, especially the sleeves and skirts, show a clear understanding of their construction and application. A boulder in the main Chaco drainage includes depictions of women wearing fringed shawls (Figure 4). Brugge (1980:55) wrote that, “They obviously date well after the return from Fort Sumner, but while the traditional dress of the late 19th century through mid-20th centuries was in style.” Several of the recorders felt that this emphasis may indicate that the artists were women. Helen Crotty (personal communication 1996) who worked with the original recorders, also commented that the loving attention to detail gave a strong feeling that they were created by women.

Only two men were shown in detail. The most impressive male is located in the large panel with 10 women and a few female children. He is wearing a fringed shirt with gloves, a squared-off hat, an earring, boots
Figure 4. Layered groups moving in several directions, depicting a complex scene. The average figure is 10 cm high.
with spurs, and an indication of a beard (Figure 5). Further up the canyon is a male rider who is stylistically different, with a contoured body, a broad-brimmed hat, and possibly chaps and spurs. Most of the detail is allocated to the horse he is riding. This lone rider was probably created by a man with intimate knowledge of horse trappings (Figure 6).

The figure just mentioned belongs to a subgroup of horseback riders within the category of realistic figures. These could be referred to as one of the defining types of Navajo human figure drawings on rock, since these are figures that can firmly substantiate the culture group of the artists. However, these riders are not always illustrated in a realistic style. Some consist only of one or two lines to indicate a figure. Others show a series of quick scratches that sometimes have overlapping scratches for hair. The broad-brimmed hatted horseback rider shown earlier has a more realistic rendering. Some riders do not possess a lower body. Grant (1978:217), in referring to the riders in Canyon de Chelly, noted that they “are stiff and doll-like often with triangular or hour-glass bodies perched on the horse’s back with no attempt to indicate that the rider rode astride his mount.” This deficiency is possibly caused by the difficulty of depicting this seated position. Although these figures are usually drawn or scratched; an occasional pecked petroglyph appears.

**Dancing Forms**

Dancing figures comprise a second style group. They are generally illustrated with much less detail than the realistic figures previously discussed. Some of the figures have indications of wearing feathered headdresses, holding rattles, and wearing fringed skirts, fringed masks, and a necklace and belt ornament. One figure placed next to a possible fire seems to be static, whereas the others appear to be in motion. The figures are approximately five heads tall. Rectangular bodies slightly flared at the bottom have angular arms with no indication of hands. These legs and feet are constructed of rectangles and triangles (Figure 7).

Elsewhere in the canyon are found detailed, scratched, and painted dancing figures that are more naturalistic in form and proportion. Schaafsma (1980:326) points out that these are dancing human impersonators who are illustrated “in a realistic, lively manner that catches the rhythm of the dance.” Details on the figures include wide collars, skirts, and animal skins, and they hold rattles and evergreen branches. Complex compositional panels such as these are possibly precursors to modern Navajo painting (see Schaafsma 1980:327, Figure 269).

**Sacred Forms**

Sacred-form figures constitute the third group, and they are depicted in a more stylized manner using the dominant geometric shapes found in sand paintings. These have the least amount of detail, with only vague indication of facial features. A few lines radiate from the top and sides of heads, the hands, the corners of the skirts, and the bottoms of legs to indicate feet. They usually have unreal proportions, with figures about four to six heads high. Arms are shown in a bent position pointing upward. Hands are often empty, but sometimes hold arrows, bows, rattles, feathers, and other objects. Legs are composed of a combination of triangles. Feet and legs are shown in the conventional sideways manner, either to show direction (Schaafsma 1963:56) or because it is much more difficult to draw frontal feet. Headdresses are frequent. One interesting form is a figure enclosed by a triangular shape
Figure 5. Probably non-Navajo male with beard, fringed shirt, boots, and spurs.
Figure 6. Horseback rider smoking, while following a group of simplified horses that were probably drawn at an earlier time period.

that represents the backs of two realistic female forms. This figure has been purposefully scratched over, as are other rock-art panels of similar subjects not only in the Chaco region but throughout the Four Corners. Schaafsma (1980:309) refers to ritual obliteration and changing. Vandalism could also be considered as a cause. Other Chaco figures in the sacred-form category are shaped by joining triangles into hourglasses and decorated with branches (Steed 1980:80, 81, 131). Illustrations of this type and style have been purposefully excluded from this paper, but are available in many of the cited references.

NON-CHACOAN NAVAJO HUMAN FIGURES

In the Dinetah, where the people seemed to have lived a more complex life (Brugge 1986:23-24), sacred forms are painted with much more detail and care of execution. Geometric patterns adorn their clothing and bodies. The proportions are shorter. Polychrome figures are beautifully executed. Often, details on these figures give clues to their individual significance. "...Some closely resemble modern figures in sand paintings, but not so highly stylized." Grant (1978:232) mentioned that, unexpectedly, very few of
Figure 7. These forms show movement even in their simplified and sketchy styles. They are from 10 to 20 cm in height.

These figures were found in Canyon de Chelly. He explains this absence by pointing to a gradual change to predominantly secular themes that occurred in the Largo/Gobernador area before the Navajo moved to Canyon de Chelly. Schaafsma (1992:27) believes that this was a consequence of a change in ceremonial practices and that religious images were then limited to sand painting and that possibly resulted from intensified White contact, prompting a reluctance to create sacred figures in a permanent form. Earlier, she (Schaafsma 1963:58), explained the differences in styles between the pictographs and the sand paintings. "In the sandpaintings all traces of the natural body curves are lost and figures are rendered in strictly angular geometric forms. The necks and bodies of the figures grow disproportionately long ...."

Two almost identical figures appear in close proximity in Tapia Canyon. Both have rectangular bodies with incised outlines and abraded interiors except for a small portion at the bottom. Other features include a tapering rectangular head topped by two overlapping triangles, upward-pointing angled arms, anatomically contoured legs, and collar-like lines. Zigzags extend from under the arms to beyond the corner of the skirt and end in triangles. At first it was assumed that both were made by the same person, but closer observation of detail and proportion indicates otherwise. The shorter figure is more highly patinated, which suggests an earlier date, and is more skillfully executed. These figures may be associated with a nearby pueblito site that dates from about 1780 to 1790 and also the home of a well-known warrior (Brugge, personal correspondence 1996).
In other places, sacred figures are simplified using only rectangles and triangles. Sometimes, triangles are opposed, creating hourglass bodies. Schaafsma (1963:60) shows that sacred figures are the most frequently found subject in the Navajo Reservoir District. While “few Navajo paintings in...canyon (de Chelly) depict supernatural and mythological figures” (Grant 1978:217), four sites recorded in the Canyon del Muerto Survey Project contained sacred forms.

Distinct from the full figures are several images of heads or masks. These again point out the stylistic differences between realistic and sacred forms. A drawing of a head from the central reservation is very realistic, while a ritual mask from Chaco is composed of only geometric shapes.

CONCLUSIONS

After examining the way that Navajo represented human forms on rock surfaces in Chaco Canyon, the Dineta, and Canyons de Chelly, del Muerto and Tapia, three different styles emerged. Navajo usually portrayed people like themselves in a very realistic manner. Curvilinear forms predominate. Dancers who represent spiritual beings were frequently stylized, while sacred figures were more abstract with mostly geometric, rectilinear shapes. It appears that the closer the subject was to reality, the more realistically it was rendered. Speculation leads to the idea that these styles were purposefully developed to distinguish, define, and separate the images. In addition, each artist of these human-form petroglyphs and pictographs added an individual and gender-based variation.

More effort needs to be devoted to in-depth recording of Navajo rock art. Very few sites have been documented other than through cursory photography. Further study emphasizing the techniques of manufacture, the choice of location, and deeper understanding of the role and meaning of this work could be attempted. This would preferably be undertaken by the descendants of the creators. In addition, non-Navajo could offer a comparative and disassociated view. However, all persons concerned with Navajo culture should be aware of the on-going destruction of Navajo rock art that has been rapidly increasing in recent years and should promote conservation and education efforts aimed at encouraging respect for and preservation of Navajo rock art.

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The study of the preeminent prehistoric culture of Chaco Canyon has received much attention in recent decades, as well it should. In the background of the research have always been the people who have lived there in historic times—the Diné or Navajo. Without their constant help and assistance both in the research projects as grunt laborers and as occupants of a harsh land showing that a living could be made there in spite of climate, soils, and moisture, our knowledge of the prehistoric Pueblo peoples of Chaco would be bereft of much.

This is about some of the Navajo I have known in my times in Chaco, such as the 1942 and 1947 University of New Mexico archaeological field schools and employment as a National Park Ranger at Chaco from 1954 to 1956. It is meant to document some of their behavior patterns (and those of the National Park Service, its employees and neighbors) and at the same time indicate their contribution to Chaco Canyon.

FIELD-SCHOOL DAYS

The first Diné that I had as a colleague was Antonio “Tony” Trujillo. That summer of 1942, Tony taught me much about archaeological excavation. Tony had worked with most of the previous excavators in Chaco—Hewett and Judd—and he was old enough in 1942 to have even worked for Wetherill. With his big black cowboy hat and blue jeans and his hair tied in a chongo, he was what one thought of when thinking Navajo.

He and I were assigned to clean out a room of BC 57. I was a total innocent, as this was my first field-archaeology experience. Tony’s experience saved me though, for as we were digging, a dark brown streak showed up in the hole I was digging. Tony did not speak English, or at least he would not speak it. He indicated it was the room floor with a guttural word in Spanish, suelo, or floor. Fortunately I did understand a little Spanish, but in my uncertainty, I looked up and there perched on the wall watching us was Frank H.H. Roberts Jr., another old-time Chaco archaeologist. He simply nodded yes, so I handed Tony my sack of Bull Durham and we rolled and smoked a celebratory cigarette. I had made an archaeological blunder by digging through the floor, but Tony kept it from being much worse by his sharp, experienced eye.

That same summer of 1942, the field school employed another Navajo by the name of Dave Skeet. Dave was an interpreter and informant for Flora Bailey and Leland C.
Wyman, who were working on Navajo ethnology at the field school.

All of the students at the field school lived in the hogans on either side of the administration and dining-hall building: girls down canyon and boys, up. Dave Skeet roomed with me and a couple of other college students. The hogans were sparsely furnished with bunk beds, a wooden table and a couple of chairs, and that was all. The wind blew in and out the door and the window brought in sand and dust. Spiders and other varmints lived in the log roof. There was no maid to clean up, and it was beneath our dignity. Dave Skeet finally could take it no longer and moved out to live in the open. I soon followed as my eyes were glued shut every morning from allergies and the dirt and dust of the hogan. I know Dave was probably cussing (or whatever Navajo do) under his breath at the filthy white guys with whom he was forced to live. I did not blame him.

In the summer of 1947, the University of New Mexico held its largest and last field school at Chaco Canyon. Some 70 students were there. Among them was my future wife, Marian Young, who worked in the kitchen. One Navajo female, Katherine Cly, also worked in the kitchen. She was the same age as the other girls in the kitchen and had been away to school. Katherine was fairly progressive. In order not to stand out among the other kitchen help, who all wore blue jean pants, Katherine contrived to start out from the family hogan, where her mother and others could see her, dressed in standard Navajo female dress, in other words, velveteen blouse and several long, colored cotton skirts. Somewhere between hogan and field school she had secreted blue jeans and another, less Navajo-style blouse, which she proceeded to change into, thus arriving at the field school dressed much like the rest of the kitchen crew. Walking back home she reversed the process and her culture.

Clyde Beyal, a local medicine man and one of our workers, accompanied the field-school group on a trip to Mesa Verde the summer of 1947. As we went past the dioramas in the museum, I noticed Clyde enter the room that, at the time, contained the somewhat gruesome mummified body of a cliff dweller named "Esther." Clyde entered the room, turned around, and saw the mummy in the corner, which petrified him. He came out of the room like a shot. I quickly figured out what had happened, so I suggested that he start at the other end of the museum and look at the artifacts. I had completely forgotten that they had an osteology collection of mostly grinning skulls at the other end of the museum. Clyde shot out of that room too, as though the devil had him, and he gave me a look of hatred as if I had done it on purpose. I felt for him.

CHACO CANYON STAFF

Marian and I became good friends with Katherine and her husband, John, when we lived at Chaco and worked for the National Park Service (Figure 1). Katherine was willing to go along with the old people in her dress and lifestyle, for they knew that things were changing, the old timers were passing on, and her children would be able to forego some of the inhibiting Navajo cultural traditions that kept Navajo out of the mainstream of American life (Figure 2). When last we had contact with her a few years later, she was living in a trailer in Bloomfield, New Mexico. The trailer may have faced east in traditional Navajo style, but it was a far cry from the traditional hogan.

We went on several picnics with Katherine and John. We usually brought hot dogs and potato salad. They brought kid goat ribs and
Figure 1. John and Katherine Cly and family, 1956.

Figure 2. Janet Pierson and Jo Ann Cly, 1956.
watermelon, even when the watermelon was so expensive we refused to buy it. Their son Danny and our son Dale played cowboy and Indians—both of the cowboys looking for the Indians while we talked (Figure 3).

Charley Tancitty Atencio was one of the men who frequently worked for the monument. He was a good mason having either learned from building hogans or worked on Gordon Vivian’s stabilization crew, or probably a little of both. My wife was amazed to see him lifting quite large and heavy sandstone blocks over his head when building the walls in the backyard of our Park Service house.

Charley’s family had a grazing permit up on Chacra Mesa at the east of the monument. Once a year they came through the monument heading for the Chacra with a flock of sheep and goats (Figure 4). They passed right in front of the Park Service houses, so the day they came by we all ran out to take pictures as it was quite a photogenic scene with Fajada Butte in the background, the sheep and colorful Navajo with their wagon.

As we were busy taking pictures, Charley’s mother scooped up a little brown kid and presented it to our son, aged 5. Dale handed it to his mother, who was saying no, no. Marian then passed it back to Charley’s mother, who spoke no English, who promptly gave it to Dale again. The young goat made several more circles until we finally got the message that we were the puzzled owners of an orphaned goat.

On a trip to Albuquerque a few days later we were forced to take the baby kid who rode, with bottle, for the most part, on the back of the front or rear seat of the station wagon. This brought about some humorous reactions from passengers of cars who passed us. On our return to the Chaco we bundled up the kid and his bottle and took them up to Katherine Cly’s mother, who also could speak no English, and gave the kid to her. She understood, and “Bucky” reportedly lived to be an old goat age at her hogan.

Charley inadvertently got us into an interesting situation. He apparently had a not-so-good reputation about paying his bills with the local trader, Harry Batchelor. So, when Charley came to Harry to get an advance of food and money to go on a working trip with the stabilization crew, Harry told him he would only give him the advance if he signed a power-of-attorney for his government check. Charley, who may or may not have known what a power-of-attorney was, signed it over to Harry.

When Charley got back from working, his government check was at the post office in the trading post and Harry gave it to him to be signed. Charley refused and begun to wave the check around, taunting Harry. He grabbed the check, signed it with his power-of-attorney, and gave Charley the change owed from the bill.

To say the least, this upset Charlie, and he complained to the Chaco Superintendent, Charles Sharp. Sharp had sympathy for the Navajo and promptly called the Navajo police down at Crown Point about the matter. The Captain of Police, a Caucasian, showed up at the office soon after. He suggested that Sharp put out a stop order on payment of the check.

When I found out what was going on, I first suggested that the government had a form (as they always do). They did, and even though I suggested that the police captain could have done this if he had the power of his convictions, Sharp filled it out and sent it in. I had told Sharp about the power-of-
attorney to no avail. Back came a photograph of the check with the power-of-attorney legally signed by Harry. The dust settled, and Charles Sharp had a little better idea of the complications that traders had in dealing with some Navajo. It was not always easy or cut and dried.

Superintendent Sharp was quite willing to do things for the Navajo that worked for us. However, his knowledge of Navajo customs was not too great. He became a little upset when some of the workmen did not show up after a weekend Navajo ceremony. I tried to explain to him the religious and social importance of their ceremonials. I explained that they were as important to the Navajo as Christmas was to us, but we made them take Christmas off, which really made little sense if we were to give them a problem when they wanted to take off for a ceremony.

I was also put in the position of trying to explain Navajo behavior to Harry Batchelor,
the trader. Even though he had a Navajo woman, Ella Cly, working for him and giving him good information on what was going on in the world of his Navajo customers, he did not always believe her (Figure 5). This was particularly true when she told him the story of the local Navajo witch.

A young Navajo, going to school in Utah, had drowned. Several days later the good Christians held their ceremony in Utah for the boy and recorded it. Then they were to bring the boy’s body back to his home in a coffin. This alone upset some of the local Navajo, as it was customary to bury the body the day it died. But to add to this was the rumor that the boy had drowned because of a local male witch who had caused it from long distance. Tensions were high and the so-called witch was threatened with his life. Fortunately for him, he chose the better part of valor and fled the country.

Harry Batchelor had a hard time believing all of this, as it was beyond his California-based experiences. I gave him a copy of Kluckhohn’s *Navajo Witchcraft* (1944) to read and educated him a little in Navajo beliefs.

It all somehow reminded me of the experience Art Werito had in Gallup. He and another Navajo had gotten a little too much to drink and found that the local police were after them. In an attempt to hide, they entered a church where services were going on. In the words of Art Werito, “They were hollering and singing and rolling on the floor. Me and Jimmy got scared and left.” Presumably they left to deal with the cops, whose habits they understood much better.
Art Werito also told me about the “little fuzzy thing” he saw under his pickup truck one day. It did not physically bother Art, but he believed it to be a ghost and again, he was scared.

I noticed that the supply of motor oil on the shelves of the trading post was a mixed bag of different weights from 10 weight on up to the heavier 40 weight. I asked Harry about this. He said that all the Navajo wanted was oil, and they cared little the viscosity of it. Later, curious, I asked Art Werito how he managed to get his old Chevrolet truck started on the real cold mornings we had been having. He said he simply started a small fire under the oil pan to warm it up. Thinking about the wooden floor in the bed of his pickup, I asked if he pulled forward when it started. He said he did. I then asked what he would do if the engine died when the bed was over his fire. He looked a little started, as though he had never thought of that.

One of the services of the National Park Service provided for the local Navajo was burial in the small cemetery just west of Pueblo Bonito. The cemetery apparently was started in the days of the Wetherills, as Richard Wetherill’s body was buried there in 1910 after he was murdered by a Navajo. Later, in 1954, the family placed Marietta Wetherill’s ashes in Richard’s grave, she being his wife.

Jackson W. “Smokey” Moore, Jr., a seasonal ranger in 1955, got to help Charley Tancitty Atencio bury his 14-year-old sister in the graveyard. The graveyard is located in the trash mound of a small pueblo ruin against the north cliff, consequently there are also unmarked prehistoric burials there too. Smokey was amused at Charley as they were digging and running into human bones. Charley would throw them out muttering, “deer.” This solved any religious problems he might have had for a curing ceremony if they were identified as human.

There were many other burials in the cemetery, most of them unmarked. Neil Judd, leader of the National Geographic excavations in Pueblo Bonito in the 1920s, tells of burying the daughter of old Padilla in the cemetery in 1923. Otto Henley, apparently just a passerby or nearby rancher, buried a Navajo child at

Figure 5. Ella Cly, 1956.
the request of the parents in the cemetery in January of 1944. Superintendent McNeil and Gordon Vivian buried an 18-year-old daughter of Charlie Atencio in May 1949. Wellito Julian, a Navajo man, was placed in the cemetery by Arthur White, Jack Williams, and Gordon Vivian in August 1952. Who says archaeology cannot be practical!

As the post-War prosperity began to hit Chaco, several of the Navajo purchased second-hand pickups in Gallup or Farmington. We never could figure how the automobile dealers felt that the temporarily employed Navajo were a good credit risk, but they did. The upshot was that repossessioners would periodically show up at Chaco either wanting us to garnish their wages, which we could not do, or to try to find the pickup. They received little sympathy from us as they usually showed up in the middle of an important work project, like the cleaning out of one of the wells. We found out later that the Navajo had figured out a way to confuse the whole issue. They would find two compatible pickups, Chevys were a favorite, and simply switch the motors. When the title was compared with the body and motor registration numbers, it made little sense and probably served the auto dealer right for his con job in the first place.

Most of our Navajo workmen soon learned basic mechanics and kept their old pickups and our old pickups and other equipment running most of the time. Some of our and their equipment had seen better days, but by hook or crook and far from town mechanics and supply stores, it was kept running.

Coming back from Crown Point one day, I was driving an old Ford pickup and accompanied by Archie Werito. As we topped the hill just south of the south entrance, driving in the middle of the road, as was the custom, the motor dropped out of the truck. I was flabbergasted, but before I could even mutter a few good old Anglo-Saxon expletives, the young Navajo had jumped from the truck and ran back down the road to pick up the bolts that attached the motor to the frame. He then proceeded to get out the jack and place it under the motor, jacking it back into place and slipping the bolts into their holes to once again tie the whole thing together.

It may be hard to believe, in these days of complicated auto engineering that filled up the motor compartment so that one could hardly get a finger in to fix anything, that the motor fell out without the fan cutting the radiator. Nothing else broke or fell off, so we proceeded on our way home. Unfortunately, we did not find the nuts to secure the bolts and, as I did not see the maintenance man, Jess Marble, that evening to tell him what had happened, the old pickup treated him the same way the next day as he went sailing by the residential area with me watching. Jess solved the problem the same way as the young Navajo and got nuts back on the motor mount bolts, for it never happened again.

We did not go to Crown Point any more often than necessary, as it was an unimproved road and a good one to get stuck in after a rain. It has not improved any, as I found out a few years ago when the Chaco Old Timers had their meeting in Gallup and Chaco. The second day had to be canceled because of the rains on the Crown Point road and the impossibility of getting from Gallup to Chaco.

I did have to take one of our workmen down to the hospital at Crown Point on one occasion. He had complained of hurting his back and, to make certain it was not something more traumatic, I got the job of taking him there. As the doctor, a Caucasian, and an employee of the Bureau of Indian
Affairs and the Public Health Service, examined the workmen, we got to discussing Navajo medical practices. It soon became obvious that the doctor had no idea what Navajo medicine men did to cure their patients. With my meager knowledge, I knew that some of what they did was good and other things were contraindicative. I was somewhat appalled to discover this lack of knowledge and gave the doctor a list of several publications that I thought might help him with his Navajo patients. However, the entire incident was indicative of the approach the Bureau of Indian Affairs took in taking care of their dependents at the time.

Others were not much better. I took the family to a summer Navajo ceremonial one evening. As I looked across the large bonfire, I saw a group from the hospital and school just south of the Blanco Trading Post. The hospital and school were run by the River Brethren, a Mennonite group, as a mission. The females of the group were all decked out in long dark dresses, practical black shoes, and little white crinoline hats making quite a contrast with the Navajo females in velveteen blouses, colorful long multiple skirts, and silver and turquoise jewelry. I do not know what the missionaries expected, but when the dance started with a line of mostly naked Navajo men with their bodies painted in clay, it was not long until they departed. I got the feeling they were astonished at the pure paganism of the dance and its participants and their inability to do anything about it. All of their missionary work was to no avail, as they saw, I am certain, many of their supposed converts here.

The only thing that bothered me at the dance was Joe Cly, one of the dancers and a workman at Chaco. He had a hollow wooden tube with a feather fixed to a wire so that he could magically produce and disappear the feather during the dance. The only problem was that he recognized me by sticking the thing in my face periodically, and there was a wire sticking out that I feared would go into my eye. I solved the problem by moving back into the crowd where he could not get to me.

Navajo dances were a most interesting entertainment and social event for the isolated inhabitants of the Chaco country, both native and white. At one of the dances I spotted two of our workers a little the worse for drink. The Navajo police usually convinced the ceremony givers to have the dance on lands over which they had some authority, in other words federal lands on which the Navajo had leases. Chaco is not located on the reservation but in the so-called “checkerboard” area where every other section was owned by the government and the others by the Santa Fe Railroad or whomever they sold it to. So it was a mixed bag and hard to keep straight who had authority over what. At any rate, I attempted to get my workers into our car where they would not be picked up by the Navajo police, thrown into their paddy wagon, and hauled off to jail. It was an impossible task as I had no way of locking these miscreants in, and they kept getting out and I kept hauling them back. The Navajo police were totally frustrated by these actions as they had no authority over me and could not quite figure out what to do about the crazy belagana who kept dragging these drunken Indians around the outskirts of the dance. Or perhaps they did not care so long as someone was taking care of them. The liquor finally put the two guys to sleep in the back of my car, and I got to enjoy the dance.

I was intrigued by Harry Batchelor’s accounting of the fact that a Navajo couple had gotten involved in the Native American Church and were taking peyote, the narcotic cactus, at their meetings. There had been
much to do about the use of peyote in the newspapers and the professional journals of the time. One side said it was dope and should be illegal; the other side said it was not as bad as alcohol, which everybody could use and besides it was an important part of the religion. Harry was righteously upset about his customers taking "dope." I suggested to Harry that he would be better off fostering the taking of peyote, selling it even along with the paraphernalia that went along with it and the ceremonies, as one could not take alcohol when using peyote. The result would be fewer drunks, since the Native American Church had much the same moral standards as most Christian religions.

One last bicultural Chaco story, one that won Superintendent Irving McNeil the nickname of "Bearhide." During his pre-World War II tenure at Chaco, McNeil had been having trouble with horses belonging to the Navajo north of Chaco walking the cattle guard and getting into the monument for the good grazing there. The monument was completely fenced and had been long enough for soil conservation purposes that it had a lush growth of grass and browse too tempting for Navajo livestock and the Navajo herdsmen. The Navajo domain was sadly overgrazed.

Having heard somewhere that horses had a fear of bears, McNeil contrived to obtain a bearskin that he proceeded to tie to the fence at the problem cattle guard. The trader in those days was established at a much used little building at the front of Pueblo del Arroyo. He noticed shortly after McNeil had put the bearskin on the cattle guard that his trade with the northern Navajo fell off dramatically. When the trader finally figured out what McNeil had done, he confronted him and informed him of Navajo superstitions. The Navajo believed that the souls of some of their ancestors dwelled in the form of bears, and they would not come near the bearskin. Since it was right next to the gate that they and their wagons had to get through, they were not about to have anything to do with passing through it. McNeil took the bearskin down and tried to figure a better way to keep horses out of the monument. The trader's business came back to life, and McNeil learned a lesson in Navajo traditions and superstition. If the National Park Service had had any simpatico toward the Navajo, they would have required some sort of training in Navajo culture.

Some of the above problems have been rectified in recent years by the permanent hiring of local Navajo at the now-termed Chaco Culture National Historical Park and by the works of David Brugge in Navajo history and ethnology for the National Park Service.

— Moab, Utah

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The discovery of European armor in an archeological setting in New Mexico has been a rare occurrence. For over 60 years, brigandine plates have been found in a single area near Aztec, New Mexico, but no scholarly study of the artifacts or the site has been done. Recently, a collection of representative specimens was donated to San Juan County Museum Association, Salmon Ruin, Bloomfield, and an investigation of the history of the find as well as its historical significance is under way. This preliminary report will summarize the progress to date and suggest further lines of inquiry.

**HISTORY OF THE FIND**

The following has been derived from articles published in newspapers and collectors’ magazines (Boettcher 1980; Cornelius 1941; Hawk 1969) and from interviews with local people who have been involved with recovery of the artifacts for over 30 years.

At some uncertain time (but probably in the 1920s), a sheepherder named T. O. Kirk found some metal plates near Aztec, New Mexico, and brought them into town. T. A. Pierce, a local banker, apparently realized that they represented Spanish armor and visited the site with Kirk. Together they found “half a lard pail” of the objects, and Pierce kept his portion, along with a map of the site, at his bank. There the specimens lay forgotten until they were discovered by others when the bank was moved in the late 1960s.

As Kirk and Pierce were both deceased, a new search was made using Pierce’s map, and the site was relocated, assured by finding more plates on the surface. Metal detectors were then used to locate additional artifacts but, after the area had been thoroughly hunted and proved no longer productive, once again interest waned. In 1995, the family of Joe Boettcher, one of these metal detectors, donated his collection to the San Juan County Museum Association, and the present study was begun.

**THE SITE: LA 114,349**

The site at which the plates have been found lies in a large, roughly triangular area formed by the Colorado-New Mexico border to the north, the San Juan River to the east and south, and the Animas River to the west. Because of the proximity to the rivers, the area is archaeologically rich and has received close attention, as a result of intense oil and gas activities in recent years. Remains of pit house dwellers as well as Puebloans, Navajo, and Ute abound, and the area is famous for
the PIII structures at Aztec Ruins National Monument and Salmon Ruin.

The armor was found on the west side of the divide between the San Juan and Animas Rivers and just south of Hart Canyon. The site area itself is quite small, encompassing less than .2 hectare, and has little to differentiate it from many square kilometers of surrounding countryside. The area is characterized by piñon and juniper growth interspersed with sagebrush flats. The only remarkable features at the site are two sandstone pillars approximately 10 m in diameter by 5 m tall; such sandstone formations are not unusual in the neighborhood. The Knickerbocker Peaks are clearly visible to the south, and these two mesas are landmarks that can be seen for many kilometers, especially from the south and west.

No other artifacts or remains other than the metal plates are known to have been recovered. One pottery fragment and one lithic flake are said to be associated, but their exact provenience is uncertain. Surface examinations by archaeologists from the Division of Conservation Archeology and the Bureau of Land Management have recently been conducted without result. Subsurface study has not yet been done.

THE ARTIFACTS

To date, a total of 127 shield-shaped plates, 3 rectangular plates, 33 cones, and 16 small spherical objects from several collections have been examined. In addition, 198 shield-shaped plates are known to exist but have not been inspected, either because permission has been denied or because their present location is uncertain. Representative specimens now in the collection of the San Juan County Museum Association are shown in Figure 1.

Shield-Shaped Plates

These plates make up by far the majority of the collections (Figure 2). They are quite regular in their size, shape, and rivet placement and examination suggests that they were manufactured by stamping, swaging, or cutting from a sheet of metal and were not formed individually by hand. Well-preserved specimens measure 26 mm wide, 40 mm in length, and approximately 3 mm in thickness and weigh roughly 5 grams. They are slightly bowed with the convexity to the side opposite the side from which the rivets protrude, and each has a raised border along the straight edges of the convex side. At least two plates show remains of leather beneath the rivets. Fifteen of the plates examined have small "thread" holes drilled along the borders: three have one such hole, six have two, and six have four.

Rectangular Plates

Only three rectangular plates are known, and these appear similar to the shield-shaped plates with the curved lower portions removed (Figure 3). They measure 26 mm wide by 22 mm long, and rivet placement is identical to the shield forms. None shows evidence of bowing. All three of these specimens have "thread" holes: one has one such hole, one has two, and the other has four.

Cones

Most of these objects are poorly preserved and vary in length and weight but were formed by rolling a triangular sheet of metal to shape. None shows further modification.

Small Spherical Objects

These round balls were found in association with a group of cones and appear to be of a
Figure 1. Representative specimens of brigandine, San Juan County Museum Association.

Figure 2. Shield shaped plate.
Drawing actual size.

Figure 3. Rectangular plate.
Drawing actual size.
similar metal as the other specimens. They measure 4 mm in diameter and are not perforated.

Metallurgical Testing

Archaeometallurgical testing of several specimens in the San Juan County Museum collection has been done by Dr. David Killick from the University of Arizona, Tucson. Examination of two well-preserved shield-shaped plates and a cone reveal that they were made from similar iron of rather indifferent quality with much entrapped slag. Inclusions are iron oxides and iron-rich glasses and indicate a bloomery process; the absence of sulfur rules out smelting with coke. A high phosphorus content suggests the use of a sedimentary iron ore, probably bog iron, which was widely used as an ore source in Europe. A surface coating of tin, present on the shields and cone, is probably applied by dipping the individual pieces. Unfortunately, there is no method presently available to date the time or specific region of manufacture.

BRIGANDINE

Brigandine was a type of armor made and used throughout Europe from the fourteenth to the sixteenth century. Metal plates were riveted to the inside of a vest or jacket made of canvas or leather, which was then lined with a soft material. The plates overlapped one another and were often coated with tin to prevent rusting. The protruding rivet heads visible on the outside of the garment could be arranged in attractive patterns, and gentlemen were sometimes attired in brigandines of velvet or silk for court wear (De Leguina 1912). Cheap to manufacture when compared to plate armor, light and allowing freedom of movement, it was often the armor of choice for infantry and other foot soldiers. It was also favored by highway robbers and similar unsavory sorts, and thus the derivation of the term “brigand.”

Early brigandines were made with rather large rectangular plates, and the garments were fastened down the center of the chest and over the shoulders with straps and buckles. As this form of armor evolved, the plates became smaller, and the fastening was done with laces (Eaves 1989). A similar type of armor was the jack, or jack of plates, differing from brigandine in that the plates were secured to the garment by either placing them in pockets or by sewing them to the interior rather than riveting.

With the advent of gunpowder and the use of small arms and artillery in warfare, the popularity of armor began to wane in Europe, and the tourney ceased to be a sporting event. By the late sixteenth century, armor was retained in many wealthy households as heirlooms and was given to the sons coming to the New World to seek their fame and fortune. When Oñate prepared to come to New Mexico in 1598, quartermaster inspections of his men of fighting age revealed a mélange of armor, most simply described as cota de malla, or “coat of mail” (Hammond and Rey 1953).

Brigandine has been found in archaeological settings in Virginia (Outlaw 1990; Straube 1996), Florida (Peterson 1956) and the Caribbean (South 1991). Armor finds of any kind have been rare in New Mexico, most noteworthy being an archer’s helmet and scraps of chain mail at San Gabriel de Yunque (Lambert 1952). Although iron deposits existed in Mexico and the American Southwest, mining equipment was utilized for the more profitable extraction of precious metals, and all iron and steel available in early Colonial New Mexico was brought over from Europe by boat and up from Mexico by cart.

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Armor, hot in summer, cold in winter and uncomfortable for full-time wear, was too valuable to simply discard and was sometimes converted to more useful items such as horseshoes, nails, and tools (Simmons and Turley 1980).

THE SAN JUAN BRIGANDINE

Specimens from the San Juan brigandine have been examined by curators of arms and armor both in the United States and Europe. No such similar plates, or lames, have been seen, and the find represents a unique example of scale brigandine previously known to exist only through medieval manuscripts and art. Probably this was a leather vest or sleeveless jacket, with the plates inside overlapping like shingles on a roof (Figure 4), and the rivet heads protruding in a linear array. Eaves (personal communication 1996) believes that the cones might be the tippets for laces, but the number of known specimens makes it possible that they served a decorative function. The role of the small iron balls is unknown. The garment in its original state probably weighed in the neighborhood of 4 to 5 kg.

When this brigandine arrived in the New World, who wore it in New Mexico, and how it came to rest on the highlands east of the Animas River remain speculative at best. The documented exploring expeditions of the sixteenth century did not enter the area, and the activities of the Oñate colonists in the early seventeenth century are poorly known. Investigation of early Colonial New Mexico history will continue, but the answer to these questions will likely remain a mystery.

In summary, a study of the San Juan brigandine offers an insight into the history of early Colonial New Mexico and provides an opportunity to evaluate a unique example of armor and armor technology of medieval Europe. Grant monies are presently being sought for geophysical remote sensing to determine if additional armor fragments remain on the site and to identify potentially related features. If additional specimens or features are located, archaeological excavations are planned to more accurately assess their context.

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WEAVING AT THE MARGINS:
NAVAJO MEN AS WEAVERS

Louise Stiver

Most handmade textiles produced by Navajo artisans are the work of women, and the image of the Navajo woman at her loom has become synonymous with this art form. In actuality, Navajo men have also been weavers for many generations, but their work has been little acknowledged outside or even inside their communities. Further, the contribution of men to this rich tradition has been largely undocumented. Recent trends suggest that, for diverse reasons, there are a growing number of male weavers—many more than in the past. This preliminary survey explores the tradition of weaving as practiced by Navajo men.

DOCUMENTATION ABOUT MALE WEAVERS

Navajo scholars propose that Pueblo people likely transferred their weaving knowledge to Navajo women. How this tradition was conveyed from one group to another is not well understood, although a number of interesting proposals have been suggested (e.g., Kent 1985:8; Webster 1997:523-524; Wheat 1977:424). Some authors maintain that weaving was first established as a woman’s specialty within Navajo society because of the structure of sex roles (Dockstader 1987:16; Kent 1985:8; Webster 1997:523-524). Although it is unknown whether men learned to weave when it was established as a Navajo tradition, Navajo oral history maintains that weaving is one in which both males and females can participate.

The earliest written documentation about Navajo weaving is from Spanish accounts that date to the early 1700s (Kent 1985:9). However, information about male participation in the weaving tradition is largely undocumented prior to 1900 (Whitaker 1986:15). Although Navajo men were mentioned in early reports as constructing their own clothing, it is unclear whether they were also weaving. For instance, Jonathan Letterman, an army surgeon, reported in 1855 that “men, as a rule, make their own clothes” which might include skin or woolen breechcloths, moccasins, shirts or blankets (Amsden 1934:109-110; Bloom 1936:227-228; c.f. Hedlund 1996:52, 55). Later Amsden (1934:107) reported that knitted leggings were part of the male attire, and “knitting was and still is mostly done by the men.”

In the 1880s, when Navajo weaving gained popularity through exposure to the increased trade and tourism brought about by American settlement and the Santa Fe Railroad, a small number of weavings attributed to men were documented in published reports (James 1920:115, 122-123, 158; Matthews 1884:385). In the early twentieth century,
Hosteen Klah was one of the few male weavers whose identity became known. His sand painting rugs, which he began to weave in 1919, gained notoriety because of their controversial nature (Dockstader 1987:24; Newcomb 1964; Reichard 1936:161).

Museum record-keeping practices further complicate documentation about Navajo weavers because they hold few weavings that are attributed to individual artists before 1900. Early in this century, a small number of female weavers became “familiar to the public through Fred Harvey postcards” (M'Closkey 1994:187). Other than Hosteen Klah, whose weavings are documented in a number of museums, individual male weavers are rarely mentioned in accession records until the 1960s. A survey of textile collections at several regional museums supports the lack of attribution to individual weavers. And attributions to male weavers are often more vague than to female weavers. For instance, a blanket at the Museum of Northern Arizona (E4194), dated 1890–1900, identifies “Sagnienitso,” son of Sagnie Badanna, as the weaver. The Museum of Indian Arts and Culture, Laboratory of Anthropology, houses a Storm Pattern rug (9532/12) purchased from Shonto Trading Post in 1936. It was woven by “Etcloic” or “Itlohi” (roughly translated as “one who weaves”), a male weaver at Betatakin. Possibly during earlier times some men were reluctant to identify themselves as weavers, which is sometimes the case today.

CURRENT ECONOMIC TRENDS AFFECTING MALE PARTICIPATION

As increasing numbers of men participate in what is perceived by outsiders as being a largely female occupation, it is particularly important to document new trends and attitudes about this rapidly evolving folk-art tradition on the Navajo Nation. A preliminary survey that I conducted over the past year of a small sample of individual traders, weavers, and businesses across the American Southwest has documented over 100 male artists from the Reservation who are represented in Navajo weavers’ cooperatives, trading posts, galleries, art shows, and museums. This sample likely represents but a small number of the male weavers now active in this traditional art form.1

Interviews conducted with Navajo traders and weavers indicate that there is a growing number of male weavers, many more than in the past and for diverse reasons. Over the past three decades, the recognition of Navajo textiles as an art form and the marketing of this work as art rather than craft have drawn more males to the weaving profession. The identity of both male and female weavers is more important to collectors now as arts and crafts fairs, museum exhibits, galleries, and venues for “master” Navajo weavers provide greater exposure for this art work (Figure 1). The majority of today’s male weavers are under 50 years of age. They are generally more open about their profession and may aggressively sell their work to galleries, trading posts, and collectors.

In addition to changes in the art market, poor economic conditions and the lack of job opportunities on the Navajo Reservation have led an increasing number of men to weave (Hedlund 1996:200). Weaving provides an economic alternative to commuting to low-paying jobs on- or off-Reservation, which often take men away from their families during the work week.

Male weavers are often mentioned as exceptional weavers in early publications (Anderson 1953:87; Hill 1935:272; Matthews 1884:385; Reichard 1936:161). Weavers today who teach their sons to weave or traders who
sell work by male weavers often remark that men are better weavers than their female counterparts—they more readily learn weaving techniques, they quickly strive for perfection, and they produce some of the best and most innovative Navajo textiles. However, one must keep in mind that there are many exceptional female weavers with women producing more than 99 percent of all Navajo textiles.

In the past, male weavers may have produced special types of weavings (Tanner 1968:63). This may still hold true for a small number; however, most weavers today include diverse weaving styles in their repertoire, with an eye toward the market. Extended families may foster a number of male weavers who become known for particular design innovations or styles.

Today a growing number of artisans are creating unique and innovative textiles within the traditional Navajo weaving genre. They continue to be hand woven on upright looms and are made from handspun or commercial wool yarns. My recent research indicates that a small number of male weavers also raise their own sheep and process (clean, card, spin, and dye) the wool by hand for their work.

CHOOSING TO WEAVE

Western society tends to classify Navajo weaving as a female occupation. Rodee
(1995:169) suggests that “more young men are weaving as the traditional ideas of the division of labor disappear.” Dockstader (1987:24) mentions that “it is unusual in Navajo life for men to work in a craft that is usually assigned to women.” And Gladys Reichard (1936:161) states, “If a Navajo man weaves, he is put in the class of ‘man-woman,’ a category sanctioned as including such men as want to carry on woman’s activities” (c.f. Hedlund 1983:274). Changing Western attitudes about gender boundaries and sexual orientation have likely encouraged more Navajo male weavers to take up weaving and identify themselves as weavers. However, Navajo people have another point of view on this.

Flexible gender roles within Navajo society enable men to take up weaving without compromising their identity. The weaving process is passed from one individual to another irrespective of gender (Whitaker 1986:367). The Navajo classify themselves as female, male, or “nadleeh.” In Western terms, “nadleeh” includes hermaphrodites, transvestites, bisexuals, and homosexuals (Hedlund 1983:274; Hill 1935:273).

According to Wesley Thomas, a Navajo weaver, there are currently two types of male weavers—one is gender-based (“nadleeh”) and the other is heterosexual. Thomas contends that while the gender-based weaver “evolved from the Origin Story....[in which] First Woman appointed a non-male or non-female” to weave, the heterosexual weaver weaves for economic reasons (Norrell 1994:6-7). I would add that gender-based weavers may also choose to market their work and that a growing number of male weavers today fall into the heterosexual category.

Since the Navajo weaving tradition is one in which both males and females can participate, men can generally weave without compromising their identity. However, they may not always choose to identify themselves as male when marketing their work. Men sometimes sell their weavings under female family member names because women may command a higher price. Conversely, the “rare” male weaver may command a higher price than comparable female weavers (Hedlund 1983:274). Some men also weave rugs with their wives and jointly share the artistic recognition.

Men often learn the weaving process and accompanying prayers and songs from female members of their family, a tradition that is passed down through generations by family members. Men are sometimes taught to weave when there are no women to pass the tradition on to within families (Thomas 1996:34). Interestingly, some male weavers are now passing their weaving knowledge directly to their sons. Further, more female weavers are now teaching their sons to weave.

CONCLUSION

The contributions of men to the rich Navajo weaving tradition have been largely undocumented. Today, male Navajo weavers are growing in number. They weave for a variety of reasons, many choosing to do so for the creative process and because it provides a flexible alternative to the lack of job opportunities on the Reservation. Once thought of as an exception, these artists are gaining exposure as stakeholders in Navajo textile arts. Increasing visibility through galleries, art fairs, weavers’ cooperatives, exhibit catalogs, and museum displays will likely increase the already growing number of male weavers (Bonar 1996; Hedlund 1992; McGreevy 1994).
This article is a preliminary survey for a larger research project. I, along with Navajo consultants and Museum staff, plan to conduct field research by identifying additional weavers through interviews with known male weavers and through contacts made at Community Chapter Houses on the Navajo Nation, at trading posts, and with collectors and museum curators. The Museum aims to commission weavings from 15 to 20 male weavers for a traveling exhibition about the Navajo male weaving tradition.

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—Curator of Collections, Museum of Indian Arts and Culture/Laboratory of Anthropology, Museum of New Mexico, Santa Fe, New Mexico

END NOTE

1 Ann Hedlund devotes endnotes 4 and 64 to a discussion of contemporary male weavers in “More of Survival than an Art: Comparing Late Nineteenth- and Late Twentieth-Century Lifeways and Weaving” (1996).

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The Navajo archaeology of the Dinétah has traditionally revolved around research concerning *pueblitos*, ceramics, rock art, and, to a lesser extent, forked-stick hogans. In the past few years, however, new feature types have been identified that can contribute significantly to understanding the Navajo occupation of the area. Culturally modified trees, predominately junipers, are often associated with Navajo sites and can provide information concerning the time period of a site's occupation, as well as data on early Navajo wood-use practices. This paper describes two different types of tree modification: that associated with wood procurement for artifact manufacture and that associated with tree felling.

**INTRODUCTION**

Perhaps more than any other group in the Southwest, the Navajo have creatively exploited the wood resources of their Colorado Plateau environment. During the nineteenth and twentieth centuries, the Navajo used wood to construct a variety of structure types, including forked-stick, cribbed-log, and many-legged hogans, as well as different types of corrals, shades, sweat lodges, and various ceremonial structures (Dean and Russell 1978; Warburton 1985). In addition to these structure types, the Navajo constructed *pueblitos* in the eighteenth century, and possibly earlier (Towner 1997). Wood has also been used to manufacture a variety of artifacts, including *tablitas*, dance paddles, digging sticks, cradle boards, saddles, and bows and arrows (Brugge 1994; Carlson 1965; Elmore 1944). Thus, understanding Navajo wood-use behavior is critical to properly interpreting Navajo archaeological sites and the Navajo adaptation to the vast piñon-juniper woodland of the northern Southwest. This paper focuses on two recently identified Navajo wood-use behaviors: tree harvesting for construction and wood-slab procurement for artifact manufacture.

At least seven different Navajo sites in the Dinétah area of northwestern New Mexico (Figure 1) contain culturally modified trees, all of which are juniper. Five sites (LA 104,123, LA 105,407 LA 113,352, LA 113,287, LA 113,376 ) contain “scarred” trees that indicate wood procurement for artifact manufacture, and two sites (LA 105,417 and LA 113,173) contain evidence of different methods of tree harvesting. The scarred trees are identified by cut marks made with a metal ax, typically to remove pieces of wood from the living tree without killing it. The scarred areas differ in size, shape, tree species, and presumed function from the more well known “peeled”
Figure 1. Location of sites discussed in text.
trees (Montorano 1981, 1988; Swetnam 1984) of other areas of the Southwest. There is no evidence, neither archaeological nor ethnographic, that these junipers were used as supplemental food resources, as were the peeled ponderosas of other areas.

Tree-harvesting methods differ significantly, depending on whether or not a metal-ax was used. Metal axes were used to harvest trees and to trim and debark beams; metal-ax use leaves relatively unambiguous evidence of historic-period wood use. Another method of tree harvesting is burning the lower trunk. Burned stumps are common around Navajo sites in the Dinétah (B. Johnson, personal communication 1993), but not all are the result of cultural burning. The sites and features described below have been identified in two different parts of the Dinétah, Frances Mesa (Sesler and Hovezak 1998) and San Rafael Canyon (Towner and Johnson 1996; see Figure 1), but are undoubtedly present in other areas as well (Wharton et al. 1996). The identification and dendrochronological sampling of these features during archaeological surveys can aid in the temporal placement of sites, as well as illuminate important aspects of Navajo wood use.

SITE LA 104,123

Site LA 104,123 is located on a mesa point that juts north into an unnamed tributary of San Rafael Canyon. Three Corn Ruin (LA 1871) is visible 300 m to the east, and Old Fort Ruin (LA 1869) is 700 m north, but is obscured by trees and another mesa point. The mesa top is covered by a moderately dense piñon-juniper forest and an understory of mountain mahogany, sagebrush, Mormon tea, and broadleaf yucca.

The site consists of five features (Towner and Johnson 1996): a culturally modified (scarred) tree, three small scatters of oxidized sandstone, and a charcoal-stained area. Only Feature 1, the scarred tree, is of concern here. Feature 1 is a living juniper tree located 20 m south of the mesa edge. Only one lobe of the tree remains alive. The scarred areas are visible on dead lobes that have been partially covered by later growth. The tree is 1.2 m in diameter at its base and approximately 8 m tall. Six or seven separate scars were formed by the removal of 2- to 3-cm thick strips of wood of varying length and width (Figure 2).

Figure 2. Photograph of scarred areas on juniper at Site LA 104,123.
The scars were made with a metal ax and represent deliberate removal of strips of wood approximately 15–20 cm wide, 30–40 cm long, and 2–3 cm thick. The scars are located at varying heights on the tree and do not represent an aborted attempt to fell the tree. Tree-ring samples were taken from the dead wood just above or below the scar and from the adjacent lobes in order to date the removal of the wood. Outside ring dates of 1650++B, 1755vv, 1751vv, and 1750vv were obtained from the scarred areas and 1640vv and 1832++vv from the adjacent lobes. The loose cluster of noncutting dates in the 1750s suggests that the strips of wood were removed during that decade. A sample taken from a metal ax-cut piñon limb 3 m to the north dated to 1867++B; it clearly represents a later use of the area and may date in the twentieth century.

When the tree was described and slides shown of the scars at the Eighth Navajo Studies Conference in Farmington, New Mexico, in April 1995, the immediate response of several Navajo in the audience was that these slabs were used to manufacture cradle boards. Ethnographically, cradle boards were made of juniper and several other materials, and other similar-sized items were made of juniper as well (Elmore 1944; Kluckhohn et al. 1971). Thus, although the scars may represent evidence of wood procurement for cradle-board manufacture, that is only one of several possible explanations for the scars.

SITE LA 113,352

This Navajo sweat-lodge site is located on a narrow bench at the north rim of Frances Mesa (see Figure 1), overlooking the head of an unnamed tributary of Frances Canyon to the east (Sesler and Hovezak 1998). The area is wooded with mature piñon-juniper and a fairly dense understory of upland shrubs.

Feature 1, the sweat-lodge midden, is evidenced by a large burned rock refuse midden and a carbonaceous stain, probably marking the location of a hearth used for heating the stones. A few badly weathered juniper-pole fragments mark the location of the lodge but are inappropriate for dendrochronological sampling.

Feature 2 is a mature, living juniper tree that exhibits removal of a long slab of wood from the lower trunk, approximately 40 cm above the base of the tree. The tree, located approximately 10 m northwest of the sweat-lodge at the base of a low sandstone ledge, exhibits a very contorted trunk with a diameter of approximately 70 cm (Figure 3). Prominent metal ax marks, defining the upper and lower end of the removed slab, are located 106 cm apart. The upper cut is approximately 7 cm deep, and the lower cut is 4 cm deep. The slab width varied from 12 to 18 cm. A portion of the trunk immediately above the ax cut is dead and was apparently killed by removing the wood slab. The tree-ring sample collected from this area yielded an inner ring date of 1401 and an outside ring date of 1698vv inc. The sample contains approximately 80 sapwood rings and, according to the dendrochronologist who analyzed the specimen, is probably very nearly a cutting date (D. Bowden, personal communication 1997). Thus, the wood was procured sometime after the spring of 1698, but probably prior to A.D. 1700.

The length, width, and thickness of the specimen suggests it may have been used as a “bow stave.” Similar tree modifications, also inferred to be evidence of bow-stave harvesting, have been described in the Great Basin (Wilke 1988). Navajo bows were often...
made of juniper (Elmore 1944), but other materials were used as well.

**SITE LA 113,376**

Site LA 113,376 is a small, multi-component site that occupies a narrow, south-trending ridge near the rim of Frances Mesa (Sesler and Hovezak 1998). The site overlooks the head of an unnamed tributary of Frances Canyon to the south (see Figure 1). The site is in a mature piñon-juniper woodland with a sparse understory comprised of sagebrush and upland shrubs.

Cultural remains consist of two features and a spatially associated concentration of early Pueblo gray sherds. Feature 1 consists of an irregularly shaped 2-by-4-m carbonaceous deposit containing numerous gray-ware sherds, as well as a small amount of oxidized sandstone debris.

Evidence of Navajo use of the area is defined by an ax-scarred tree where a slab of wood was removed from a mature, live juniper (Figure 4). Although the area contains several ax-cut trees that are of obvious historic origin and are probably associated with a historic camp (LA 113,377) located a short distance to the east, the ax marks on this particular tree appear much older and are more weathered. In addition, several centimeters of new growth partially obscure the right side of the removed slab, suggesting a considerable number of rings has been added to the tree after removal of the slab. The scarring consists of the removal of a 70-cm-long slab of sapwood from the east face of the tree, extending from waist to shoulder height. Estimated width of the slab is 10–12 cm, with a thickness of approximately 3 cm. Although the ax marks are weathered, they are sufficiently abrupt to infer that a metal ax was employed. Unfortunately, the tree-ring samples collected from the tree failed to yield a date, primarily because they exhibited erratic ring growth. Nevertheless, the weathering of the cut marks and subsequent growth of the tree suggest Navajo period wood-procurement activity.
Figure 4. Photograph of scars on juniper at Site LA 113,376.

SITE LA 113,287

This Gobernador phase Navajo habitation site occupies the east slope of a broad, north-south trending ridge line on Frances Mesa (Sesler and Hovezak 1998). The site area is immediately below the crest of the ridge spine that forms one of the highest landmarks on the mesa (see Figure 1). Old-growth piñon and juniper woodland support an upland shrub understory of serviceberry, bitterbrush, and mountain mahogany.

Cultural evidence consists of the remains of at least three and probably four hogans and several extramural activity areas. The presence of Gobernador Polychrome sherds in several contexts indicates that the site dates to the Gobernador phase (Brown 1996).

Features 1, 2, and 3 consist of the unburned and collapsed remains of structures, probably forked-stick hogans. All have been vandalized and are evident as scatters of weathered and partially decayed juniper timbers and shorter split timber sections forming a ring around a central area of bare ground, a configuration suggesting that the timbers have been cast aside to expose underlying fill. Unfortunately, the wood is too fragmentary for dendrochronological sampling. Although largely comprised of short, split sections, each structure contains several full-diameter timbers that, with the exception of sapwood attrition and checking, are probably nearly complete. Most of these exhibit basal burning, although some shorter sections are abruptly fractured and possibly shaped with a metal ax. Limbs were trimmed from all construction timbers with a metal ax. Other features include Feature 4, probably the remains of a forked-stick hogan; Features 5 and 7, possible middens; and Feature 6, a deposit of carbonaceous sediment.

Site LA 113,287 is surrounded by many juniper trees that appear to have been culturally modified. These include live old-growth specimens with twisted branches and partially charred trunks. The site also contains numerous burned juniper stumps and several abruptly fractured stumps that may have been ax-cut. The datum tree, designated as Feature 8, is a 40-cm-diameter live juniper that exhibits several twisted branches, some obvious ax-cut branches, and clear ax marks on the trunk that are partially obscured by new-growth lobes. In contrast to the scarred trees at LA 113,352, LA 104,123, and LA 113,376, this example seems to have
focused on the removal of bark and cambium instead of the procurement of a wood slab (Figure 5). Three core samples and an ax-cut branch section were collected as tree-ring samples LPM-577a, b, c, and d. A core from a similar tree located 10 m south of Feature 2 was also collected (LPM-578). Immediately east of Structure 3, an ax-cut stump (LPM-579) and an ax-cut branch from a live juniper (LPM-580) were also sampled.

Figure 5. Photograph of scarred juniper at Site LA 113,287.

The tree-ring samples from LA 113,287 produced nine dates (Table 1), three from architectural contexts and five from living or dead junipers. Neither sample from the Feature 1 hogan has sapwood, indicating considerable exterior ring loss. Because sample LPM-575 is piñon (which does not exhibit identifiable sapwood), and because the field notes indicate that portions of the wood element from which the sample was taken exhibited beetle galleries, the 1684+vv date may not be much older than the outside ring date. Sample LPM-576 is a juniper vv date that lacks sapwood and thus predates hogan construction by an unknown number of years. In any case, the structure certainly postdates A.D. 1684. The single noncutting date (LPM-573) from Feature 2 suffers considerable outer ring loss, as indicated by the absence of sapwood, and the structure must have been built many years after A.D. 1658. The nearby metal ax-cut stump (LPM-574) produced a noncutting “++” date of 1738. The harvesting of the tree that produced the stump occurred sometime after A.D. 1738 and may be associated with the construction of Feature 2 or one of the other architectural features on the site.

Although two of the three samples (LPM-577a and 577b) taken from the scarred face of Feature 8 produced noncutting dates, the presence of sapwood indicates that they have suffered minimal exterior ring loss. The dates place the modification of the tree in the late A.D. 1740s or early 1750s and are consistent with dates from the structures and other culturally modified trees on the site. The third core from this tree (LPM-577c) passes through the living part of the trunk but could not be dated because of erratic ring growth. A metal ax-cut branch from this same tree (LPM-577d) yielded a noncutting date of 1737++vv that places removal of this limb sometime after A.D. 1737. A noncutting date from a core sample taken from the face of a second ax-scarred tree (LPM-578) places
Table 1. Tree-Ring Dates from LA 113,287.

<table>
<thead>
<tr>
<th>Provenience</th>
<th>TRL No.</th>
<th>Species</th>
<th>Inner</th>
<th>Symbol</th>
<th>Outer</th>
<th>Symbol</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature 1</td>
<td>LPM-576</td>
<td>Juniper</td>
<td>1558</td>
<td></td>
<td>1666</td>
<td>vv</td>
<td></td>
</tr>
<tr>
<td>Feature 1</td>
<td>LPM-575</td>
<td>Piñon</td>
<td>1610</td>
<td>p</td>
<td>1684</td>
<td>+vv</td>
<td></td>
</tr>
<tr>
<td>Feature 2</td>
<td>LPM-573</td>
<td>Juniper</td>
<td>1484</td>
<td>±p</td>
<td>1658</td>
<td>+vv</td>
<td></td>
</tr>
<tr>
<td>Stump</td>
<td>LPM-574</td>
<td>Juniper</td>
<td>1548</td>
<td></td>
<td>1738</td>
<td>+ +vv</td>
<td>Sapwood present</td>
</tr>
<tr>
<td>Modified Tree</td>
<td>LPM-578</td>
<td>Juniper</td>
<td>1613</td>
<td></td>
<td>1741</td>
<td>vv</td>
<td>Sapwood present</td>
</tr>
<tr>
<td>Feature 8</td>
<td>LPM-577a</td>
<td>Juniper</td>
<td>1653</td>
<td></td>
<td>1745</td>
<td>+vv</td>
<td>Sapwood present</td>
</tr>
<tr>
<td>LPM-577b</td>
<td>1606</td>
<td>±</td>
<td>1746</td>
<td>+vv</td>
<td></td>
<td></td>
<td>Sapwood present</td>
</tr>
<tr>
<td>LPM-577d</td>
<td>1596</td>
<td>±</td>
<td>1737</td>
<td>+ +vv</td>
<td></td>
<td></td>
<td>Sapwood present</td>
</tr>
<tr>
<td>Stump</td>
<td>LPM-579</td>
<td>Juniper</td>
<td>1458</td>
<td></td>
<td>1742</td>
<td>vv</td>
<td></td>
</tr>
</tbody>
</table>

Modification sometime after A.D. 1741. A stump near Feature 3 returned a noncutting date (LPM-579) that places felling of the tree after 1742. Together, the dates from this badly disturbed site give a fairly consistent picture of occupation in the middle of the eighteenth century, probably in the A.D. 1740s or early 1750s.

SITE LA 105,407

Site LA 105,407 is an extended Navajo activity area located on the east side and below the crest of a ridge in San Rafael Canyon (see Figure 1). The east slope is dissected and has thick but isolated stands of piñon and juniper. Three features and an artifact scatter were identified (Towner and Johnson 1996); only Feature 3 is discussed in detail in this paper. Feature 1 is a 5-by-5-m concentration of artifacts and 10 sandstone slabs. The oxidized sandstone slabs appear to be the remains of an eroded feature, possibly a sweat lodge. Feature 2 is a hearth measuring 2.0 by 2.5 by .15 m, with an artifact scatter on its south side. The artifacts present include 15 Dinétah Gray sherds, a Jeddito Black-on-yellow sherd, an obsidian flake, and a brown petrified-wood flake.

Feature 3 is a scarred juniper tree with a sandstone slab resting on one of the tree limbs. The tree has a diameter of 1 m, and the scar is located on the south side of the tree. The part of the tree removed measures 25 by 30 by 10 cm, and moss and lichen have grown across the limb and over the slab (none was observed under the slab). The slab was not modified, and the function of the feature is unknown.

The single scar on the tree begins below a metal ax-cut limb and terminates just above ground level. It may represent a "wooden slab
procurement” activity similar to that identified at LA 104,123 and LA 113,287, or a strip accidentally peeled away from below the ax-cut limb when the limb was removed.

Tree-ring samples were taken from ax-cut limbs, the scarred tree, and stumps in the site area (Table 2). Although all nine of the samples taken were dated, none provided cutting or even near cutting dates. Both a lack of sapwood on the samples and a lack of date clustering indicate a site occupation sometime in the 1700s, probably after A.D. 1732.

**SITE LA 105,417**

Site LA 105,417 consists of a scarred juniper tree and another juniper with an ax-cut limb, located at the bottom of a side canyon tributary to San Rafael Canyon, midway between Old Fort Ruin and Three Corn Ruin (see Figure 1). Vegetation consists of juniper, piñon, mountain mahogany, Mormon tea, and snakeweed.

The scarred tree is situated on the north bank of the drainage on a small bench, and the ax-cut limb is on a juniper growing on a steep slope approximately 30 m to the southwest (Towner and Johnson 1996:Figure 50). The scarred tree contains two, possibly three, ax-cut scars visible beneath newer growth lobes. The scars vary in length and width, but all are located approximately 40 cm above ground level. Because these scars are similar in size and located at the same tree height, it is possible that the scars were caused during an aborted attempt to fell the tree, and not as part of any “wood slab procurement” activity. Five tree-ring samples were taken from the two trees (Table 3).

The tree-ring dates indicate the modifications to the tree occurred sometime after A.D. 1756, but are almost certainly associated with the Navajo occupation of the area. This tree modification is one of the latest precisely dated Navajo activities in the Dinétah.

### Table 2. Tree-ring Samples from LA 105,407.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Description</th>
<th>Outside Ring Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNT-877</td>
<td>Ax-cut limb, living juniper</td>
<td>1666vv</td>
</tr>
<tr>
<td>DNT-878</td>
<td>Ax-cut limb, living juniper (scar)</td>
<td>1622vv</td>
</tr>
<tr>
<td>DNT-879</td>
<td>Ax-cut limb, living juniper</td>
<td>1732vv</td>
</tr>
<tr>
<td>DNT-880</td>
<td>Ax-cut limb, living juniper</td>
<td>1684+ +vv</td>
</tr>
<tr>
<td>DNT-881</td>
<td>Ax-cut juniper stump</td>
<td>1617vv</td>
</tr>
<tr>
<td>DNT-882</td>
<td>Ax-cut limb, living juniper</td>
<td>1622vv</td>
</tr>
<tr>
<td>DNT-883</td>
<td>Ax-cut juniper stump</td>
<td>1629vv</td>
</tr>
<tr>
<td>DNT-884</td>
<td>Ax-cut juniper stump</td>
<td>1660+ +vv</td>
</tr>
<tr>
<td>DNT-885</td>
<td>Ax-cut juniper stump</td>
<td>1636vv</td>
</tr>
</tbody>
</table>
Table 3. Tree-ring Samples from LA 105,417.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Description</th>
<th>Outside Ring Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNT-872</td>
<td>Ax-cut limb other tree</td>
<td>1745 vv</td>
</tr>
<tr>
<td>DNT-873a</td>
<td>East lobe, living lobe scarred</td>
<td>No date</td>
</tr>
<tr>
<td>DNT-873b</td>
<td>East lobe, scar edge</td>
<td>1745 vv</td>
</tr>
<tr>
<td>DNT-873c</td>
<td>West lobe, living lobe scarred</td>
<td>No date</td>
</tr>
<tr>
<td>DNT-873d</td>
<td>West lobe, scar edge</td>
<td>1756++ vv</td>
</tr>
</tbody>
</table>

SITE LA 113,173

Site LA 113,173 is an early Navajo activity area that occupies a low, narrow eolian ridge and adjacent drainage system near the south rim of Frances Mesa (see Figure 1). The site is in an open, mature piñon and juniper woodland with an understory of Gambel’s oak, bitterbrush, serviceberry, mountain mahogany, sagebrush, joint fir, and rabbitbrush (Sesler and Hovezak 1998). Cultural remains include five features arranged in linear fashion along the drainage. Because the site contains few surface artifacts, determination of cultural and temporal affiliation relies largely on feature morphology. Features 1 and 2 are both comprised of burned sandstone debris and probably represent sweat-lodge middens. Feature 3 appears to represent a small slab-lined hearth. The fifth and most prominent feature, a large concentration of oxidized sandstone debris probably associated with a sweat lodge, occupies a second drainage near the rim.

Feature 4, a mature living juniper with a burned trunk, is of particular interest because it represents clear evidence of an attempt to harvest a live tree by burning through the trunk near ground level. The burning caused a portion of the tree to die, but part remained alive and continues to grow. An oxidized sandstone slab rests horizontally in the charred concavity at the base of the tree (Figure 6). The presence of this slab in such a position provides evidence that the tree was intentionally burned at its base, presumably as a method of harvesting construction materials. The slab may have served to deflect thermal energy upward during the burning process. Smith (1974:116) documents a similar method of tree harvesting among the northern Ute of Utah.

The trunk diameter of the burned portion of the tree measures approximately 40 cm; including the burned and living portion of the tree, the trunk diameter is approximately 65 cm. The burned concavity measures 40 cm wide by 35 cm deep and 50 cm high. A thin, unshaped burned sandstone slab, measuring 24 by 16 by 3 cm, rests on the bottom of the burned hollow.

A tree-ring sample taken from the dead trunk section of the tree 1.25 m above the burn dated produced an inner ring date of 1179+p and an outer ring date of 1715vv inc; the sample contains approximately 23 sapwood rings. The date indicates that the burning occurred sometime after A.D. 1715, and the presence of some sapwood rings suggests that
Figure 6. Photograph of burned juniper base at Site LA 113,173.

the activity occurred within a few years after that date, probably prior to A.D. 1730.

DISCUSSION

There are several different aspects of the culturally modified trees in the Dinétah that warrant additional discussion. First, it is apparent that not all culturally modified trees were modified for the same reason. Morphologically, there appear to be at least two different types of modification—for "wood slab procurement" for artifact manufacture and that associated with tree felling. Both categories display at least two different techniques.

Understanding tree-harvesting methods in the Dinétah is important for several reasons. Brown (1990) has suggested that the use of dead wood for construction may have been a common Navajo practice, and, if so, radiocarbon dates from early Navajo sites may be badly skewed by the "old wood" problem. Smith (1995) counters this view with limited ethnographic information indicating that only green wood was used in hogan construction. Other ethnographic (Dean and Russell 1978) and archaeological (Fetterman 1996; Towner 1997) data indicate that dead wood was used, but the frequency of dead-wood use has yet to be assessed.

Tree-harvesting methods may provide keys to assessing the amount of dead wood used in the construction of various structures. Structural elements with root flares that show no modification were obviously procured after the tree died; excellent examples of dead wood can be found in Old Fort Ruin (LA 1869) and other sites in the Dinétah. Beams cut with a metal ax may have been cut either fresh or dead; stone axes, although extremely rare on Navajo sites, were probably only used to procure green wood because of the difficulty of cutting dead wood with a stone ax. It should be noted, however, that no stone ax-cut beams have been identified in the more than 1,000 beams sampled from pueblito sites in the Dinétah (Towner 1997).

Dendrochronologists suggest that "++" dates indicate dead-wood use (Ahlstrom 1985; Towner 1997) because, as the tree slowly dies, there are more locally absent rings that make ring counts necessary. We suggest burning as a procurement method for green
wood because of the danger of setting dead wood on fire and completely burning the tree. One of Smith’s (1974:116) Ute informants, however, indicates the method was used to procure dead wood. Thus, at this time there are few foolproof methods for determining whether or not an element was procured as dead or living wood. Date clustering may be the best method of determining the status of individual dated beams.

Although their function is unknown at this time, the wood slabs removed from junipers may have been used to make several different types of artifacts. Our initial hypothesis concerning the scarred trees was that the scars represented wood procured for making tablitas. Painted tablitas were recovered from Old Fort Ruin (LA 1869) near the scarred tree at LA 104,123 (Carlson 1965:48–50). All known tablitas, however, are made of cottonwood or aspen, not juniper.

Ethnographically, the Navajo used juniper pieces to manufacture a variety of artifact types. Brugge (1994) describes several artifacts made of “hard wood” that may have had ceremonial uses. Haile (1947:63) indicates that on the ninth night of the Night Way, Born-for-Water appears carrying “a club in each hand, a black ax of pinion, a red one of cedar” (emphasis added) Other potential artifacts made of similar-sized pieces of juniper include bows, prayer sticks (Elmore 1944), saddle pieces (Kluckhohn et al. 1971), cradle boards, digging sticks (Eddy 1966), and numerous other items of material culture.

**CONCLUSIONS**

The culturally modified trees in the Dinétah illuminate a new aspect of the archaeology of early Navajo sites, one not in the ground, but in the trees. They may help date sites that contain little architectural wood, or wood that is unsuitable for dendrochronological sampling. Currently, all identified modifications are on juniper trees. Because of the types of modification, it is unlikely that more easily dated piñon trees will be identified; such modifications will usually kill piñons, and leave little evidence in the archaeological record. Additional identification of tree species used in artifact manufacture, such as that conducted by Brugge (1994), will alert archaeologists to other potential wood uses and their possible presence in the “arboreal” archaeological record.

Most of the currently identified tree modifications were done with a metal ax. By definition, therefore, all must postdate the contact period. An interesting, but undoubtedly difficult, avenue of future research will be identifying similar features and activities associated with Navajo sites that predate European contact and the introduction of metal tools.

—La Plata Archaeological Consultants, Dolores, Colorado

**END NOTE**

1  + One or a few rings may be missing near the outside whose presence or absence cannot be determined because the series does not extend far enough to provide cross-dating.

++ A ring count is necessary because, beyond a certain point, the specimen could not be counted.

v A subjective judgement that, although there is no direct evidence of the true outside on the sample, the date is within a very few years of being a cutting date.

B Bark present
The terminal ring is incomplete, maybe because it was cut during the growing season.

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TOBACCO IN THE NAVAJO CREATION STORY

Joseph Winter

The Navajo or Diné Creation Story is at the heart of the Navajo culture and religious system. Not only does it serve as the framework for the Blessingway legend and the stories of the other chantways, but the entire Navajo ceremonial system is explained and sanctioned by the creation story, which tells about the events that occurred prior to, during, and after the emergence into the present world. The Blessingway and various chantway legends grow out of the origin story, while the ceremonials themselves are used to invoke blessings, to cure, and to restore harmony, as explained in the origin story.

There are many published versions of the origin story, but all contain a number of common elements, including the creation and use of tobacco as a sacred substance that is necessary to successfully complete the ceremonials. Tobacco is woven throughout the mythology of the story and its ceremonials, with its paramount importance reflected by the fact that creation itself was brought about when Sky Father and Earth Mother smoked this sacred plant (Figure 1). It is also used in varying amounts in all of the chantways or ceremonials, with the most common being the Blessingway (to invoke blessings, such as at weddings and house dedications), the Enemyway (to exorcise the ghosts and harmful effects of contact with non-Navajo), the Nightway or Yé'ii Bicheii (to cure head ailments and other sickness brought on by contact with the ye'iiis or deities), the Shootingway (to alleviate troubles caused by thunder, lightning, snakes, and arrows), the Mountainway (which deals with Bear Disease and the effects of other animals living in the mountains), the Beautyway (also concerned with snakes as etiological factors), and the Windway (for diseases associated with whirlwinds and other winds).

As described by Wyman (1983, 1987) all of the chantways, with the exception of the Blessingway, are aimed at appeasing or exorcising the factors that caused a disease or illness, rather than treating the symptoms of the disease itself. The Blessingway, in contrast, is used for good luck, to avert misfortune, and to invoke positive blessings, such as a dedication for a new house or a job change, protecting livestock, and aiding a woman in childbirth. Even the kinaaldá or girl’s adolescence rite is a special form of the ceremony, and there are many other occasions when a Blessingway is given.

Both the Blessingway and chantway legends and the ceremonials themselves are contained within, and grow out of, the Navajo origin story. Like the stalk of a corn plant or the central stem of a tobacco plant (Figure 2), the
Blessingway and its legends form the backbone of the Navajo religious system, while the various chantways and their legends form the leaves. This analogy with a corn or tobacco plant is very appropriate, since both holy plants are present throughout much of the origin story and are central to the Navajo culture. This paper focuses on the role of tobacco in the origin story. It also demonstrates how the Navajo Creation Story contains all of the information about the positive, sacred uses of traditional tobacco and the negative, deadly effects of tobacco misuse that a Navajo child needs to understand this powerful plant. A later version of this paper, with color illustrations, will be used as the basis for a tobacco health and cultural education book for Navajo children.

The following summary of the Navajo Creation Story is based, for the most part, on the version published by Goddard in 1933, which contains many references to tobacco. Tobacco-related details from several other versions of the Navajo stories (Matthews 1897; Stephen 1930; Stevenson 1886; Wyman 1987; Zolbrod 1984) have also been included.
NAVAJO CREATION STORY

The First World, Where Frog Grows Tobacco

Long ago, in the beginning, the surface of the earth was red, barren ground. In the east, blackness rose up and whiteness rose up.

Where the two colors joined together, First Man came into being. With him was a perfect ear of white shell male corn.

In the west, blueness and yellowness rose up. Where they joined together, First Woman came into being. With her was a perfect ear of yellow abalone-shell female corn.

First Man and First Woman rubbed off some of their skin to create Water Monster, Salt Woman, Frog, and Crane. Spider Woman also came into being, and she created Ant. The other gods were bothered so much by Ant that they moved to the four corners of the earth.

Water Monster went far to the east, where he built a house made of rainbows and sunrays. Frog went to the south, where he created a similar house. Salt Woman constructed hers in the west, while Crane built...
his in the north. All of the houses contained jars filled with precious water.

First Man and First Woman were hungry. First Man took water from the jars in each of the houses, and he made his own spring. Corn and other plants grew from the spring. Frog raised the first tobacco and watermelons near his house, while Water Monster grew the first pumpkins and squash near his house. Salt Woman raised the first beans and cotton near hers; Crane grew the first gourds and muskmelons near his. They all gave some of their seeds to First Man and First Woman, who grew the plants and were no longer hungry.

But the four gods living at the corners of the earth lacked corn, so they asked First Man for some seeds. When he refused, they became very angry. Water Monster sent Thunder to strike First Man with lightning, but First Man was protected by Horned Toad. When Frog sent Water Horse against First Man, Spider Woman spun a protective web all around him. Crane ordered Mud Turtle to attack him with arrows made of lightning, which Locust deflected with a big shirt of rawhide. And when Salt Woman sent Water Sprinkler against him, First Man was saved by Black God, who was the offspring of male Fire and female Comet.

First Man fought back by sending Black God against his enemies. Black God entered their houses, where he smashed their water jars, thereby causing a huge flood. But First Man was not afraid—he and his friends floated away on a large reed. Even his enemies became friendly, with Frog giving Black God a beautiful tobacco pouch made of water plants embroidered with beads. After Black God breathed upon it four times, tobacco appeared in it and he filled his clay pipe and smoked the tobacco. Then, as the water rose, they floated higher and higher through the smoke, until they reached the hard shell of the sky, where they could go no farther.

Suddenly the blue head of Swallow appeared in a small hole in the sky. “Come here!” he yelled. “Here is a way through the sky!” So First Man and First Woman and all of their friends passed through the hole in the sky, to the surface of the second world.

The Second World, Where Tobacco Grows on the Mountains

The whole world and everything in it was blue. There were blue swallows, blue birds, blue jays, and blue flowers. First Man laid down the mountains as they are in this world. He made sky covers for the mountains, and he fixed day and night. After he was finished, he and First Woman made the first people. One man was placed on San Francisco Mountain in the west. Another was placed on Navajo Mountain in the north. A third was placed on Blanco Peak in the east, and a fourth on Mount Taylor in the south.

First Man also brought up all of the seeds from the first world, and he planted everything that grows. He raised four animals who became the rulers of the earth—Wolf in the east, Mountain Lion in the west, Otter in the south, and Beaver in the north. This was when all of the animals and people could talk to each other.

Wild tobacco grew on the four sacred mountains. Some of the animals smoked it and felt good, and they began to teach the people how to grow corn and pumpkins and other plants and how to use tobacco in ceremonies. But the world was small and crowded, and a few of the people became witches. Another great flood was brought forth, and the people had to climb another huge reed to the third
world. They took all of the seeds and animals with them.

**The Third World, Where Coyote Bribes Frog with Tobacco**

The surface of the third world was a mixture of black and white, with white, blue, yellow, and black in the sky. There was no sun or moon, nor were there any stars. But the four great mountains were there, and when the Sky bent down and the Earth rose up, Coyote and Badger sprang from the point of contact.

Water Monster also lived in this world, in a house below the surface of a river. Coyote came wearing his blanket, armed with a rainbow. The two children of Water Monster were swimming where the water flows out in four directions. Coyote caught them with the rainbow and drew them out. Frog saw him do it, but Coyote gave Frog some tobacco to keep him quiet. Later, Frog smoked the tobacco in a turquoise pipe. Rainboy saw the smoke come out of holes all over Frog’s body. Frog invited Rainboy to smoke some of the tobacco, but his friends warned him not to, since it would stop him from resuming his proper form.

Water Monster became very angry when he learned that his children had been stolen. He became crazy with grief, so he opened up the four corners of the earth and let forth another huge flood. When the water reached the tops of the mountains, First Man erected another large reed and blew against it until it reached the sky. Everyone entered the reed and began to climb, with Turkey the last one in. By then the water was so high that it covered the ends of his tail feathers, which became white-tipped.

When they reached the sky, they could not break through. Woodpecker started pecking until the sky became thin and finally gave way. The people began to enter the hole, but they stopped when Water Monster swam up and demanded his babies.

Coyote had his blanket wrapped tightly around him. “Look in there!” someone suggested. Then everyone filled an abalone-shell basket with hard jewels, water-mineral powder, blue pollen, and cattail pollen. They placed the basket as a gift between the horns on Water Monster’s head.

“I’ll give you back one of the babies,” said Coyote. “But I’ll keep the boy. I need his white fabric to create black clouds for male and female rains. The rain will cause tobacco and flowers to grow all over the mountains and plants to spring up everywhere!” To this Water Monster agreed. The girl baby was returned, and the water stopped rising. Then all of the people passed through the hole in the sky to this fourth world.

**The Fourth World, Where Tobacco Helps Sky Father and Earth Mother**

At first the surface of this world was white. After all of the people had come up from the third world and the waters had receded to form the oceans, First Man made the Sun, Moon, Stars, Sky, and Earth. Black God told them to be useful, so Sky Father and Earth Mother smoked tobacco to bring about the rest of creation. First Man gave it to them—“All right, I see!” he said. “There should be tobacco for you!” Thus he created the wide-leaved tobacco, the slender-leaved tobacco, the dark-tipped tobacco, and the white-tipped tobacco. And he caused four sacred plants to grow on the surface of Earth Mother: tobacco, corn, beans, and squash.
When all of the animals saw Sky Father and Earth Mother smoking tobacco, they wanted some, too. Bear Boy asked the people for it. At first he enjoyed it, but when his stepmother Bear Woman saw the smoke coming out of his nose, she cried in alarm, “What are you doing?” “I’m smoking tobacco,” he said, “the sacred herb of the people.”

“Well, you are a bear,” she responded. “Bears should be able to smoke tobacco too.” So he gave her some, but she passed out and almost died after taking one small puff. Bear Boy kissed her, rubbed some tobacco on her large paws, and eventually she woke up.

Soon all of the animals were given their own tobacco, though it was much weaker than Mountain Tobacco, which the Navajo people still use. There was Bear Tobacco, Eagle Tobacco, Sheep Tobacco, Snake Tobacco, even Red-headed Ant Tobacco. All of them were different, and each animal could only use its own. If they smoked another animal’s, it was like poison. That is why Coyote died after he stole some of Sheep’s Tobacco and smoked it, so he could leap from mountain to mountain. But Coyote hides his heart in a secret place, and when the other animals found it, they brought him back to life.

For a while, the people prospered as their families grew large and spread across the Earth. Then some of them began to do bad things, and the women began to give birth to horrible monsters, which killed and ate the people. First there was the Horned Monster. Then there was the Monster Eagle. Later the Monster Who Kicks People Down Cliffs appeared, followed by the Monsters That Kill with their Eyes. Finally, the most terrible monster of all was born: Yeitso the Big Giant, who roasted people alive in a big oven made of rocks. After a while, there were only four people left alive, along with First Man and First Woman and the other gods.

Early one morning First Man and First Woman saw a dark cloud over Spruce Mountain. They asked Talking God to investigate. He climbed the mountain up into the cloud, where he found a rainbow and soft rain falling. Then he found a baby girl asleep in a bed of flowers. Born of darkness with Dawn as her father, First Man and First Woman fed her the dew of flowers, pollen from plants and from clouds, along with sun-ray pollen. She rapidly grew up to become a woman who changes with the seasons—which explains her name—Changing Woman. Later she gave birth to twin boys, whose father was the Sun.

By now there were monsters everywhere, and Changing Woman feared greatly for the lives of her sons. Sometimes she used Tobacco to protect them. It was hanging in her house, and whenever the Twins were in danger, it would light up to tell her that they were in trouble. And whenever it lit up, she put it out and the Twins would be safe again. But when they were 12 years old, they disappeared. At first she thought that the monsters had killed them, but then she learned that they had gone to visit their father, the Sun.

The Twins began their journey by stepping on two blue crosses. Next they stepped upon a cloud, and from there onto a rainbow, which carried them far into the sky. Soon they could see their father’s house. It was guarded by Bear and Big Snake—Thunder too—along with Mountain Lion and Big Wind. Before they arrived at the house, they met Tobacco Hornworm, who asked, “Where are you coming from, my son’s children?” “We come from Huérfano Mountain,” they answered.
“We are on our way to visit our father, the Sun.”

“Beware your father!” he warned, “for he kills with his tobacco.” Then he spat something into one of his many hands, and he gave it to the older brother. Again he spat, this time giving the spittle to the younger boy. “When your father prepares a smoke for you, you must put this into your mouth, then he cannot kill you with his tobacco,” he said.

After they reached the Sun’s house, they were given many tests, all of which they passed. But then the Sun took a turquoise pipe from the shelf in his house and lit it, with the light from a large red shield. He puffed on it four times. As the smoke filled the room, the boys put the Hornworm’s gift in their mouths. Then they smoked, taking turns, as the older one sang:

Ya ai, prepare a smoke for me. Now I am the child of Changing Woman as you prepare a smoke for me, I am the child of Sun as you prepare a smoke for me.

In a turquoise pipe you will prepare a smoke for me.

Now of its wide leaves you will prepare a smoke for me, of its white-tipped flowers you will prepare a smoke for me, by means of the Sun you will prepare a smoke for me.

When I finished the smoke I became various fabrics, when I finished the smoke I became various jewels.

When I finished the smoke I became various horses, when I finished the smoke I became various sheep.

When I finished the smoke I became various corn, when I finished the smoke I became various plants.

When I finished the smoke I became various captives.

When I finished the smoke, now I become long life, now one to be feared, hi yi hi pah! [from Wyman 1987:545]

Next the young one sang the song, and when the boys finished smoking the pipe, they told the Sun how sweet his tobacco was, how its sweetness increased as they finished the smoke. “It is true, my sons, you are truly my children!” he exclaimed. Then he had them sit on a turquoise stool and a white shell stool, as he shaped them exactly like himself, by rubbing them with tobacco ashes mixed with his saliva.

Finally he asked them why they were there. They told him how the monsters were killing all the people. They asked him for weapons that they could use to fight the monsters. So he gave them flint armor and helmets, shoes, and knives made of flint, along with arrows made of lightning and rainbows and white-tailed eagles. And he gave them their names—he named the older son Monster Slayer, while the young one became Born for Water.

After the Twins returned to Earth, they killed all of the monsters. Later they had many other adventures, and there were many times that they used tobacco, always in a sacred way. Sometimes they smoked it as a prayer; other times they offered it in prayer sticks or in other ways. But not everyone used it wisely or for good purposes. One time Monster Slayer met a man called Who-
Returns-to-Look-at-the-Fish. He was a great witch; he killed many people with his tobacco; he offered Monster Slayer some, in an attempt to kill him. But Wind's Child whispered a warning in Monster Slayer's ear, and instead he gave the man some of his tobacco. "Give it here, my son-in-law, prepare a smoke for me, your tobacco is certainly sweet smelling!" said the witch. And he inhaled a huge amount of it, lost his breath, and collapsed, before dying. Monster Slayer revived him by rubbing tobacco ash on him, but then he wanted even more tobacco, again he smoked, and again he died. Five times this happened, before he learned his lesson.

Two young girls also suffered terribly from tobacco, after Bear Man and Snake Man used it to make them think that they were handsome young warriors. Actually they were sick old men dressed in rags who were dying from old age. In secret, they prepared some tobacco for the girls and sent the smoke wafting across the camp, to where the girls lay sleeping. "What sort of a sweet smell is that, my younger sister?" exclaimed the older girl, when the smoke drifted into her dreams. "Let us go out to find the source!" This they did, but when they reached the source, instead of finding two frail ancient men, the tobacco made them think that Bear Man and Snake Man were handsome young men dressed in beautiful buckskins with mountain lion skin arrow quivers and mountain mahogany bows. So they stayed with the old men, and it was only later, after they stopped smoking the tobacco, that they realized how they had been deceived. Then they disappeared into the sky, where they were lost among the clouds and water.

Later, Snake Man himself succumbed to the poisonous tobacco given him by another man.

But most people used tobacco wisely, as did the animals and Holy People. When the Holy People created the animals again in this world, they prepared a special smoke for them, with Gila Monster Old Man's tobacco. They did this while Beqóchídí (the Moon) made Deer, Talking God made Rabbit, and the other gods made all of the other animals. And when the animals started to walk, the smoke was given to them, as First Man said "When they have smoked what has been prepared for them, each one will thereby have a mind of his own, and his thoughts will be wise!"

Gila Monster Old Man responded by saying "All right, here it is, certainly it may be used, that's the purpose of it!" And that was the purpose of sacred tobacco, and that still is the purpose—both humans and animals should use the tobacco that has been given to them to think good thoughts with, to pray with, to offer to the Holy People. For that is its purpose.

Many years later, all of the gods went away, with Changing Woman traveling far to the west, to a great ocean where she dwells to this very day in a floating house beyond the shore. Every night her husband the Sun joins her, after his daily journey across the sky. Their sons Monster Slayer and Born for Water went far to the north, where they still live in the valley of the San Juan River. Sometimes the Navajo people visit them, to smoke sacred tobacco and pray, and to see them in the reflection of a rainbow in the river's dark water, after a soft summer rain.
LESSONS LEARNED ABOUT TOBACCO FROM THE NAVAJO CREATION STORY

The Navajo Creation Story tells us everything that we need to know about tobacco—both the good things that happen when adults use Mountain Tobacco in a sacred way and the bad things that occur when someone uses tobacco the wrong way, by smoking cigarettes or cigars or by “dipping” spit tobacco. Let’s review some of the things that the Navajo Creation Story teaches us about tobacco:

— TOBACCO is a sacred medicine that was given to the Navajo or Diné people by the Holy People. It should only be used with great care and respect.

— TOBACCO is a very powerful plant that causes illness and death when it is used without care or respect. It should only be used in very small amounts, and only for traditional Navajo prayers and ceremonies.

— TOBACCO should never be used by someone who is not trained in its proper use. Traditional ways to use tobacco include smoking small amounts of it in ceremonies, offering it in prayer sticks, and offering it in prayers.

— TOBACCO is an addictive drug when it is used too often, and in too large an amount. It should never be smoked more than once a month for ceremonies, and even then you should not inhale it. Better yet, you do not have to smoke it—the dry leaves can be offered in the air, on the ground, in the water, or in a fire. They can also be given as special gifts.

— TOBACCO comes in many forms—some are good and some are bad. The Navajo people should use Mountain Tobacco, Dzil Nát’oh, which was made especially for them by the Holy People for use in rituals and prayers. If you cannot find Mountain Tobacco growing in the wild, you can grow the seeds in your garden.

— TOBACCO protects you—when used in a sacred fashion it provides spiritual strength, guidance, discipline, and protection. But even Mountain Tobacco can make you ill or kill you, if it is used the wrong way. Never use any kind of tobacco as a drug, or for other nontraditional purposes.

— TOBACCO should never be smoked as cigarettes or cigars, nor should you ever chew it or dip it as snuff, even in ceremonies. If you cannot find Mountain Tobacco to use as prayers, there are several other kinds of traditional tobacco that can be obtained from other Indian people.

— TOBACCO can be used for your health and well being. When used as a sacred medicine, it helps you think, and it carries your prayers to the Holy People.

— TOBACCO harms and deceives you when you use it the wrong way. Instead of helping you think, it makes you angry and unable to concentrate when you do not have it.

— TOBACCO can harm and even kill your family members, when you use it the wrong way. You do not have to use it to be harmed by it—just living or working a long time with a smoker and breathing this smoke can be enough to kill you.
— **TOBACCO** can be very harmful to children and unborn babies. Mothers who smoke are placing their unborn babies in great danger.

— **TOBACCO** kills you forever. Unlike Coyote, who hides his heart in a secret place and can be brought back to life, you are gone forever when you die from tobacco.

— **TOBACCO** can be used in a very positive way as a living plant. In fact, live tobacco plants are even more powerful than dried tobacco leaves, since they contain the spirit of life, that we share with all other plants and animals. Raising your own Mountain Tobacco is one of the best ways to use it, with care and respect. Live tobacco plants are good to have around—they produce harmony and balance, as long as they are allowed to grow. But they can also be a danger to children and pets. If you raise them, keep them away from animals and children.

— **TOBACCO** is *Dijin*, a spirit itself. When shown in sand paintings, it attracts the Holy People to help heal us when we are sick. All tobacco has positive and negative power—it can help you or harm you, heal you or kill you, depending on how you use it. *It's your choice*—use it wisely, or do not use it at all.

— Traditional Native American Tobacco Seed Bank and Education Program, University of New Mexico, Albuquerque, New Mexico

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ERRATA

Robert Weber has pointed out two places where errors occur in the annual volume 23:

p. 120, 2nd column, 1st paragraph, line 7, should read 1.8 m (not 21 m).

p. 127, 2nd column, line 6, should read influent (not influence).

We regret any inconvenience that may have occurred as a result of these errors.