Chapter 3

HISTORY OF ARCHAEOLOGY

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INITIAL EXPLORATIONS AND RECONNAISSANCE: 1776-1912

Southwestern Colorado has played an important role in the development of American archaeology as a professionalized research discipline and of Southwestern archaeology as a topic of broad interest to scholars and the general public. For well over a hundred years, the area's cliff dwellings, towers, and large open pueblos have been objects of research and public interest. There is a remarkably large and varied archaeological literature devoted not only to the Pueblo III period sites that first drew attention to the region, but to other less spectacular archaeological manifestations representing a wide variety of periods and site types. Understanding the history of research in the study area is essential to understanding the current state of substantive archaeological knowledge, research questions and paradigms, implicit and explicit assumptions, and ideas about the significance of the archaeological properties. In addition to the material that follows, the reader is referred to J. O. Brew's chapter "The History and Extent of Mesa Verde Archaeology" in his monograph on excavations in the Alkali Ridge locality of southeastern Utah (Brew 1946:15-31).

During the long period of initial explorations and reconnaissance, the focus of discovery, description, and interpretation was almost entirely on the highly visible masonry cliff dwellings, towers, and large open pueblos of the late Pueblo II and Pueblo III periods. The period starts with the mention of the Escalante Ruin near Dolores in the journals of the Domínguez—Vélez de Escalante expedition in 1776 and closes with the start of Nels Nelson's field program in the Galisteo Basin of northern New Mexico. Nelson's (1914, 1916) pioneering application of stratigraphic excavation, seriation, and correlation to the development of archaeological chronologies had widespread effects on the conduct of Southwestern archaeology, including work in the study area.

Prior to the Spanish explorations of the eighteenth century, the Ute, Navajo, and Pueblo peoples must have been aware of the area's extensive archaeological remains, and this awareness is recorded in various ways in their oral traditions. Spanish colonists in New Mexico began to send both official and unofficial parties into the Four Corners area in the 1700s (Warner 1975), but such records as exist of these early expeditions do not mention archaeological sites in southwestern Colorado. The first clear Spanish reference of this sort appears to be in the journals of the Domínguez—Vélez de Escalante expedition of 1776.[1]

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[1]This is commonly called the Domínguez–Escalante or the Escalante expedition, but Warner (1975) points out that Fray Francisco Atanasio Domínguez was the leader of the party and that the second friar's name was "...not Escalante. Escalante refers only to the birthplace of Fray Silvestre Vélez de Escalante's father. His surname was Vélez, and his contemporaries generally referred to him as such.... Properly, he should be called 'Vélez', but since at this distance in time no one would know of whom we are talking, we should use both names, that is, 'Velez de Escalante'" (Warner 1975:64).

Seeking an overland connection between Santa Fe and the Spanish colonies in California, Domínguez and Vélez de Escalante traveled through northwestern New Mexico, southwestern Colorado, and as far as the Salt Lake Valley in Utah before turning back in October 1776, due to deteriorating weather and poor prospects for reaching their goal (Warner 1975). They took a southerly route on the return trip, and forded the Colorado River in the lower Glen Canyon at "the Crossing of the Fathers" now under Lake Powell (Warner 1975).

On August 13, while traveling up the Dolores River on the outbound leg of their trip, Domínguez and Vélez de Escalante observed a small ruined building, which they recognized as being of Pueblo Indian origin. Their journal remarks: "On an elevation on the south bank of the river in ancient times there was a small settlement of the same form as those of the Indians of New Mexico, as shown by the ruins which we purposely examined" (Bolton 1950:141). The preponderance of evidence identifies this as what is now known as the Escalante Ruin (5MT2149). This site, along with the smaller nearby Dominguez Ruin (5MT2148) was excavated and stabilized by the University of Colorado (CU) in 1975 and 1976 (Reed 1979; Hallasi 1979; White and Breternitz 1979) as part of a U.S. Bureau of Land Management (BLM)-funded project dedicated to the state of Colorado's celebration of the bicentennial of the United States (White and Breternitz 1979:435). Today, the Escalante and Dominguez sites are open to the public as part of the interpretive program of the nearby Anasazi Heritage Center, operated by the BLM.

In the period 1829-1848, a commercial trading route between Santa Fe and Los Angeles came into regular use. This passed through northwestern New Mexico and southwestern Colorado into central Utah before turning southwestward through southwestern Utah and southern Nevada into southern California (Crampton and Madsen 1994). In southwestern Colorado, the Spanish Trail follows approximately the same route taken by Domínguez and Vélez de Escalante, so it is highly likely that numerous Spanish trading parties viewed the Escalante Ruin and other Pueblo sites as they passed through the study area.

In 1859, a U.S. government survey headed by Captain John N. Macomb followed the Spanish Trail through southwestern Colorado; publication of the reports was delayed by the Civil War. In the report of the expedition, geologist J. S. Newberry records several observations on the Pueblo ruins of the region. Visiting the hill on which Escalante Ruin sits, Newberry (1876:88) observed

> ...an extensive series of very ancient ruins. The principal one is a pueblo, nearly 100 feet square, once substantially built of dressed stone, now a shapeless heap, in which the plan of the structure can nevertheless be traced. Like most of the ruined pueblos of New Mexico, it consisted of a series of small rooms clustered together like cells in a beehive. Near the principal edifice are mounds of stone, representing subordinate buildings. Among these are large depressions marking the places of cisterns or estuffas. Quantities of broken pottery similar to that so commonly seen in like circumstances, but bearing the marks of great age, strew the ground about these ruins.

Newberry (1876:86) also notes small sites located several miles farther up the river, which he surmises may have been occupied "by the guardians of the fields" who were cultivating the adjoining river bottom lands. The Spanish Trail and the route of the Macomb expedition also continued northwest along the Dolores-McElmo divide, the approximate route of present Highway U.S. 666. Newberry mentions a ruin called "Surouaro" by the Utes that is at the head of what is now called Yellow Jacket Canyon—undoubtedly the present-day Yellow Jacket Pueblo (5MT5).

He judged that this extensive site, with remains of many stone houses, as well as reservoirs and canals, might have once been inhabited by several thousand people (Newberry 1876:88). Newberry also noted numerous smaller puebloan sites as the expedition proceeded. Crampton and Madsen (1994) note that Newberry also hiked to the top of the north escarpment of the Mesa Verde to get a view of the "great sage plain" that lay to the west of it. They suggest that the Mesa Verde may first have been labeled as such by Newberry or others with the Macomb party, because the first map on which it appears was one made by Charles Dimmock, cartographer of the Macomb expedition (Crampton and Madsen 1994:38).

The first thorough scientific documentation of archaeological sites in the study area was by William H. Holmes and William H. Jackson, who were members of the Hayden Survey. Formally known as the United States Geological and Geographical Survey of the Territories, and led by F. V. Hayden, this multidisciplinary geographic and scientific survey was in the field in the Intermountain region from 1867 through 1878 (Bartlett 1962). The project "laid the principal foundations for much of our knowledge of the geology, paleontology, paleobotany, zoology, botany, entomology, and ornithology of the Rocky Mountain West" (Bartlett 1962:117). Archaeology played a relatively minor role in the scientific work of the survey, but the observations of Holmes and Jackson nevertheless served to draw attention to the impressive Pueblo sites of the Four Corners area, and to influence the early development of systematic archaeology in the region. Jackson is best known as a pioneering photographer of the American West; Holmes went on to make many additional contributions to archaeology and geology.

The Hayden Survey produced a series of large format *Reports* that include long monographs, a series of smaller format *Annual Reports* that include numerous shorter papers, and a *Bulletin* series that apparently was intended to provide short accounts of some of the research for public consumption. The earliest archaeological paper is by Jackson and is entitled "Ancient Ruins in Southwestern Colorado"; it refers to observations made in the 1874 field season. It was first published in Volume I of the *Bulletin* series (Jackson 1875), with a very similar version (Jackson 1876a) later published in the eighth *Annual Report*. Part III of the tenth *Annual Report* consists of papers by Holmes (1878) documenting work done primarily in southwestern Colorado in 1875 and 1876 and by Jackson (1878) on fieldwork in Utah, Arizona, and Colorado in 1875 and on observations made in Chaco Canyon in 1877. Part III of the tenth *Annual Report* also includes a brief paper by W. J. Hoffman on an Indian cranium from Chaco Canyon. Volume II of the *Bulletin* series includes preliminary versions of Jackson's and Holmes' reports on their 1875 fieldwork (Jackson 1876b; Holmes 1876), as well as a paper by Emil Bessells (1876) on human remains associated with sites in southwestern Colorado and New Mexico.

In the study area, Jackson and Holmes documented numerous Pueblo III sites of the Mesa Verde tradition. Their maps and drawings are remarkably accurate considering the short time spent in the survey, and in some cases, their records remain the best ones available for particular sites. Although the Hayden party did not explore the Mesa Verde proper, Jackson described and photographed cliff dwellings in the lower Mancos River Canyon (Jackson 1875, 1876a). Jackson and Holmes also recorded sites along the San Juan River, as well as in the lower Animas and La Plata river valleys, Dolores River valley, throughout the McElmo Creek drainage, and in the Montezuma and Comb Wash drainages of Utah (they referred to Comb Wash as Epsom Creek). The canyon referred to as Hovenweep evidently is the present-day Yellow Jacket canyon. In addition to cliff dwellings, they documented large open Pueblo III sites such as the Mud Springs site and the Aztec Springs site (today's Yucca House) (Holmes 1878). One of the sites visited was built around a small butte that Jackson (1876a) called "Battle Rock" near the confluence of Sand

Canyon and the McElmo. Several standing walls shown in the illustrations in Jackson's report have disappeared or have been much reduced. By the 1890s, local usage had given the name "Battle Rock" to a much larger landform located a short distance downstream in the McElmo canyon proper (Ricky Lightfoot, personal communication), and at some point, the butte that Jackson had photographed came to be called Castle Rock, and the site that surrounds it "Castle Rock Ruin." It is recorded in the state site files as 5MT1825. The Crow Canyon Archaeological Center has conducted limited excavations here (Kleidon 1999a).

Maps and descriptions provided in Jackson's and Holmes' reports show rectangular surface rooms, large and small subsurface round rooms (i.e., kivas, which they also referred to by the Spanish term "estufas"), towers of various sorts, tri-wall structures, D-shaped structures, and plazas—in other words, a full range of Pueblo III architectural manifestations. Jackson and Holmes also illustrate and describe examples of pottery and other artifacts from the sites they visited, and illustrate several rock art panels. At various points in their reports, both recognize the presence of sites that lack the obvious massive masonry construction of the Pueblo III sites on which the reports concentrate; neither appears willing to attribute the observed architectural differences to changes through time, however. Although the bulk of these reports are devoted to describing particular sites, Holmes (1878:408) does venture a few generalizations:

> The ancient peoples of the San Juan country were doubtless the ancestors of the present pueblo tribes of New Mexico and Arizona....Their occupation of this region dates back very many centuries, as attested by the extent of the remains and their advanced state of decay. The final abandonment of the cliff and cave dwellings has occurred at a comparatively recent date, certainly subsequent to the Spanish conquest. The lowland remains, the extensive pueblos and great towers, are generally in a very much more advanced state of ruin than the cliff defences. It is possible that the latter owe their construction to events that immediately preceded the expulsion of the pueblo tribes from the region.

Holmes was evidently searching for a way to put the archaeological remains he had observed into a temporal sequence, but was only able to come up with weak inferences based on relative degree of preservation of buildings. Not surprisingly, the sheltered cliff dwellings were the best preserved and hence were presumed to be more recent that the large open sites. Early in the same report, however, Holmes (1878:384) suggests that the lowland sites, the cave sites, and the cliff houses may have been contemporaneous, with the last site type serving primarily as defensive redoubts rather than as residences. Both Jackson and Holmes were convinced that a period of warfare occurred late in the occupation of the San Juan region by Pueblo peoples, and were inclined to think that the Puebloans had been driven out by attacks from non-Puebloans, perhaps ancestors of the Utes. This view was bolstered by a legend to this effect—purportedly of Hopi origin—that was told them by their guide, John Moss (Jackson 1876a:380), when the party visited the evidently fortified Battle Rock (Castle Rock) site. Recent investigations by the Crow Canyon Archaeological Center have in fact demonstrated that a violent event or events occurred at the end of occupation of this site in the late A.D. 1200s, resulting in significant loss of life (Kleidon 1999a; Lightfoot and Kuckelman 1994).

In the 1870s, Lewis Henry Morgan engaged in a survey of archaeological evidence from the Southwest, the Midwest, and Mexico, working under the assumption that ancient architectural arrangements could be used as evidence of past household and community organization. Although Morgan badly misused much of the data he assembled in service of the hypotheses presented in

Ancient Society (Morgan 1985 [1877]), his basic assumptions were similar to those used in today's settlement archaeology and community pattern analyses (Lipe and Hegmon 1989:20-21). As part of his survey, Morgan visited the McElmo Valley near Cortez in 1878, stopping at the Mitchell Springs site and several others. His maps and interpretations of these sites are presented in *Houses and House-Life of the American Aborigines* (Morgan 1965 [1881]). He cites Jackson's survey reports on sites in Chaco Canyon and southwestern Colorado, and it seems quite likely that it was these reports that drew him to the Cortez area.

The cliff dwellings of the Mesa Verde have played a very large role in the development of archaeological research in southwestern Colorado, and also in the development of a national consciousness about Native American archaeology. Although the Ute inhabitants of southwestern Colorado knew of the cliff dwellings in the Mesa Verde proper, the Macomb and Hayden exploring parties did not learn of or visit them; Jackson and Holmes did, of course, document cliff dwellings in the Mancos River valley south of what is now Mesa Verde National Park (MVNP), as well as in the McElmo and other canyons farther west. In 1883-1884, S. E. Osborn, a prospector, evidently visited a number of the Mesa Verde cliff dwellings, but even though an account of his adventures was published in the Denver Weekly Tribune-Republican in 1886, it attracted little attention (Smith 1988:16).

The "discovery" that finally resulted in putting Mesa Verde "on the map" came in December of 1888, when Richard Wetherill and Charlie Mason, ranchers from Mancos, Colorado, spotted an enormous cliff dwelling—Cliff Palace—while they were searching for stray cattle on the Mesa Verde. This set off a chain of events that resulted in a great increase in scientific, public, and commercial interest in the archaeology of the area. McNitt's (1957) biography of Richard Wetherill remains an invaluable source for understanding these developments. Blackburn and Williamson (1997) provide an excellent recent account of the Wetherills' early work in Mesa Verde cliff dwellings and how this led to Richard Wetherill's two excavating expeditions in southeastern Utah (1893-1894 and 1896-1897). In addition, they describe the work of the numerous other excavators who were stimulated to dig by the Wetherills' discoveries and document, to the extent possible, what happened to the numerous collections that these activities produced (Blackburn and Williamson 1997). Ronald Lee (1970) has chronicled the events leading up to the passage of the Antiquities Act and the creation of MVNP, both in 1906. Duane Smith (1988) provides a thorough history of the development of the Park through the mid-1980s.

After the discovery of Cliff Palace, Richard Wetherill quickly began to explore the other cliff dwellings of the Mesa Verde, with help from his younger brothers (Alfred, John, Winslow, and Clayton) and others from the Mancos and Durango areas. By March 1890, they had "searched through some 182 large and small cliff dwellings in the Mesa Verde" (Blackburn and Williamson 1997:22). They also made several collections of "relics," which were exhibited in a small museum at the Wetherills' Alamo ranch near Mancos. Some of these materials were shown to the public in Pueblo and Denver, Colorado (Blackburn and Williamson 1997:22). Collections made by the Wetherills were eventually exhibited, along with other archaeological collections from the Southwest, at the Columbian Exposition in Chicago in 1893 (McNitt 1957:33). Word of the remarkable discoveries in the cliffs of the Mesa Verde rapidly spread, and the Wetherills began guiding journalists and tourists to the sites not long after the Cliff Palace discovery in late 1888.

One of these visitors, in 1891, was a young Swedish scientist named Gustaf Nordenskiöld. Enthralled by what he saw, he decided to stay and excavate in the Mesa Verde cliff dwellings. Nordenskiöld hired John Wetherill as foreman, as well as two day laborers. Evidently

others of the Wetherill family helped as their time permitted (Steen 1979). Most of Nordenskiöld's excavations were on Wetherill Mesa, and included work in Long House, Step House, and Mug House, but he also mapped several sites on Chapin Mesa, including Spruce Tree House.

Nordenskiöld's lengthy report on his work, entitled *The Cliff Dwellers of the Mesa Verde*, was published in 1893 in both English and Swedish (Nordenskiöld 1979). Although he was trained in geology and the physical sciences, rather than in archaeology, his report was exceptionally systematic and thorough for its time. In fact, it can be argued that it is the first excavation report in Southwestern archaeology that meets something resembling a modern standard, with good site maps, descriptions of the excavations, and systematic description and illustration of the artifacts found. There is no systematic tabulation of artifact proveniences, however, and in general, sherds and other broken items were not recorded (a lack that plagued site reports in the study area for many years to come). He does describe typical Mesa Verde kivas accurately and in detail, referring to them by the then-common Spanish term "estufa." He recognized, however, that they were not used as stoves or sweat-baths as this label implies, but were likely to have served as "meeting places for religious and political assemblies" as among the Moki (Hopi) of Arizona and the Pueblos of New Mexico (Nordenskiöld 1979:16-17). (See Lipe and Hegmon [1989] for a review of the use of the term "kiva" and of its functional interpretations in Southwestern archaeology.) Nordenskiöld (1979) also attempted to place his work in context by including a survey of what had been published to date on the archaeology of the Colorado River, Rio Grande, and Gila River basins, as well as chapters on the contemporary Hopi and on the status of the Pueblo Indians in the sixteenth century.

Nordenskiöld's primary contribution was to set an early standard for prompt descriptive reporting. In his concluding chapter, he does offer some chronological inferences, but these are largely based on arguments from selected premises rather than on the evidence of stratigraphy or seriation of actual archaeological material. He does note that well-made walls were sometimes abutted to walls of cruder construction, but fits this evidence into a scenario that has the Mesa Verde people occupying cliff shelters when their numbers were small, expanding into valley and mesa-top settlements as their populations grew, and then reoccupying some of the cliff shelters as last refuges after populations had substantially dwindled due to emigration. He also supports this idea with evidence that the last occupations in the cliff dwellings came to a violent end: "The memory of their last struggles is preserved by the numerous human bones found in many places, strewn among the ruined cliff-dwellings. These human remains occur in situations where it is impossible to assume that they have been interred" (Nordenskiöld 1979:170).

Despite this reference to the cliff dwellings as the last stronghold of a diminished population, Nordenskiöld thought that most of the open settlements were later than most of the cliff dwellings, and that the move to open country was in some way part of the spread of Pueblo populations east and south to the Rio Grande. He concludes that the Mesa Verde region had probably been abandoned for several centuries prior to the Spanish entry into the Southwest, and notes that there is little or no overlap in design between the pottery of the Mesa Verde area and the presumably later pottery found in the Rio Grande region. He also remarks on the distinctiveness of the pottery from "the Casas Grandes on the Rio Gila and it northern Mexico," and is "doubtful whether the inhabitants of the Casa Grandes should be included among the Pueblo tribes" (Nordenskiöld 1979:173). He apparently is not making a distinction between the Casa Grande site in Arizona and the Casas Grandes center in northern Chihuahua. Nonetheless, his comment foreshadows the distinction between Anasazi on the one hand, and the Hohokam and Casas Grandes traditions, on the other.

The excavations of the Wetherills and Nordenskiöld in the Mesa Verde cliff dwellings resulted in fuller documentation of the architecture, artifacts, and human remains of the Pueblo III period (Osborne 2000). The photographs, popular articles and books (e.g., Chapin 1988), and museum exhibits that resulted from this work fired the public's imagination and interest in things archaeological and southwestern. As a result, there was a great increase in digging elsewhere in the Four Corners area (see Blackburn and Williamson 1997), some of it oriented to the more or less scientific amassing of museum collections, but much of it designed to satisfy the growing private market for southwestern antiquities, especially pottery. The distinction between "doing archaeology" and "pothunting" was not as clear as it is today, of course, because archaeological techniques were not well developed, and in most cases, the search for display-quality artifacts was a high priority even among those who could be called "archaeologists."

The expeditions of Richard Wetherill to southeastern Utah in the 1890s had a scientific orientation, although the field methods employed were poor relative to standards developed by workers such as Nelson and Kidder a few decades later. Wetherill excavated in sheltered sites in Cottonwood and Butler Washes and in Grand Gulch in order to make collections for the American Museum of Natural History (AMNH). He observed the stratigraphic occurrence of distinctive "Basket Maker" physical types and artifacts beneath the more familiar "cliff dweller" remains (McNitt 1957; Blackburn and Williamson 1997). Although Wetherill's field methods left much to be desired and he did not write an excavation report, his rudimentary stratigraphic sequence nonetheless set the stage for the development of archaeologically based chronologies in Southwestern archaeology.

The other type of digging—for the antiquities market—is largely undocumented (as were many of the presumably more "scientific" expeditions into the Four Corners area during this period). Writing in 1903, not yet 15 years after Wetherill and Mason had discovered Cliff Palace, T. Mitchell Prudden notes that at many of the sites he visited in the northern San Juan drainage basin, the middens had been dug over in search of the whole pots often associated with burials (Prudden 1903:225, 236-237, 251-252, 263). This indicates how rapidly and pervasively the demand for antiquities had developed. Impressionistically, digging for the commercial market appears to have peaked in the Northern San Juan or Mesa Verde region in the 1890s and early 1900s, and probably did not return to this level until the 1960s.

In any case, at the turn of the century, there was rising scientific and public concern over the commercial destruction of archaeological sites, and resentment over Nordenskiöld's export of Mesa Verde collections to Europe. Local Southwestern interests also became increasingly opposed to unregulated access to archaeological sites by eastern museums and universities. In the 1890s, the Colorado Federation of Women's Clubs lobbied for state and/or federal protection of the Mesa Verde ruins, and in 1900, the Colorado Cliff Dwellings Association was formed under the leadership of Virginia McClurg and Lucy Peabody (Smith 1988) in order to mobilize public and political support for protection of the Mesa Verde sites. In the early 1900s, archaeologist Edgar Hewett (then associated with the Archaeological Institute of America) and others lobbied for an act of Congress to protect archaeological sites anywhere on federal public lands. In 1906, Hewett also threw his support behind making Mesa Verde a national park. The advent of the conservation-oriented Theodore Roosevelt administration finally created a national and Congressional climate in which such measures could be successful. In 1906, Congress passed the Antiquities Act and later in the same year, established MVNP (Smith 1988; Breternitz 1983; Lee 1970). The version of the Antiquities Act that passed was one that Hewett had drafted (Lee 1970).

Although cliff dwellings got the most scientific and public attention at the turn of the century, the extensive reconnaissance surveys of Prudden (1903) contributed an understanding of the scale and geographic extent of the prehistoric Pueblo occupation of the San Juan drainage. Prudden was a prominent pathologist from New York who took extended vacations to the San Juan country, starting in the 1890s. He later excavated at several of the sites he had encountered on survey (Prudden 1914, 1918). In his survey, Prudden relied heavily on the Wetherills and other informants to locate areas of site concentration, which he then visited. His published map is useful primarily in showing where these site concentrations occur (Prudden 1903), but he briefly discusses a few of the major sites and site clusters. His major contribution, however, was recognizing the "unit-type" pueblo, a complex consisting of an "estufa" (kiva), associated surface rooms, and midden (Prudden 1903:234-239). Prudden recognized that these small "units" most frequently stood alone as individual small settlements, but that they also occurred as elements of settlement clusters, or of large pueblos. In the Pecos Conference classification established by Kidder (1927), the "unit type pueblo" was proposed as the standard settlement type for the Pueblo II period, but Morris (1939) and Brew (1946) later showed that it was common in the Pueblo III period as well. Lipe (1989) argues that in the Mesa Verde region, this basic household-residential complex appears in late Pueblo I and lasts through Pueblo III, with both the Pueblo I "protokiva" and the later "kiva" serving residential as well as ritual functions (see also Lekson 1988; Varien and Lightfoot 1989).

In his 1903 paper, Prudden develops a fairly elaborate classification of sites on the basis of size, architecture, and physiographic setting and makes a number of interesting comments about their functions (e.g., defensive, residential) and their spatial relationship to farmland or water. He notes the potential for developing a chronology of ruins based on stratigraphic superposition, degree of weathering and preservation, and diversity of architectural types (Prudden 1903:231), but he does not follow through with any systematic consideration of chronology.

In the summer of 1907, three Harvard students—Sylvanus Griswold Morley, Alfred Vincent Kidder, and John Gould Fletcher—were recruited by pioneer southwestern archaeologist Edgar Hewett to join an archaeological project in southwestern Colorado, under the sponsorship of the Archaeological Institute of America (AIA). Morley and Kidder later became prominent archaeologists. Hewett's 1907 "field school" in Southwestern archaeology consisted of little more than setting the three students up at the Holley ranch in McElmo Canyon, and taking them to the top of a nearby mesa for their assignment: "He waved an arm, taking in it seemed, about half the world, 'I want you boys to make an archaeological survey of this country. I'll be back in three weeks'. " (A. V. Kidder, unpublished drafts of memoirs, quoted in Givens 1992:14). All in all, the novices did a creditable reconnaissance, and later published a partial report (Morley and Kidder 1917). In 1907, Morley, the oldest, was 24 or 25; Kidder was not yet 22.

Like their predecessors, Morley and Kidder appear to have focused only on the Pueblo III sites—at least in the portion of the survey published in 1917. They mapped and described several sites now in Hovenweep National Monument, as well as others in the area near the confluence of Yellow Jacket Canyon with the McElmo. They defined several site types, based on the kinds of structures present as well as physiographic setting, and ventured a few speculations about the function of these sites in a larger community pattern. There was no attempt to develop an archaeological chronology.

Morley, Kidder, and another of Hewett's proteges—Jesse Nusbaum—also worked for Hewett at Mesa Verde National Park in 1907-1908, recording and mapping some of the better-known cliff dwellings in the Park (Breternitz 1983). Nusbaum later served for many years as superintendent at MVNP.

Morley returned to southwestern Colorado in the summer of 1908 to excavate a portion of the Cannonball Ruins, located on the mesa between the lower Yellow Jacket drainage and the McElmo (Morley 1908). Funding for the excavation was organized by Edgar Hewett, under a complex arrangement whereby the primary sponsor was the Colorado Society of the AIA, with the work being conducted by the School of American Archaeology, an affiliate of the AIA. (The School of American Archaeology soon became the independent School of American Research, established under Hewett's direction in Santa Fe [Elliott 1987]). In addition, the University of Colorado (CU) and the State Historical Society of Colorado (now the Colorado Historical Society [CHS]) cooperated in the Cannonball excavation (Morley 1908:596). The collections from the dig were divided between the CHS and CU. In what must have been a record even in those simpler days, Morley's report was published in the *American Anthropologist* in the fall, immediately following the field season.

Cannonball Ruins is a good example of a compact late Pueblo III "canyon-head" settlement, with a group of surface rooms, kivas, and towers built on each side of the drainage, at the point the canyon entrenches; a large spring-fed pool lies just below the pour-off and between the north and south architectural complexes. Morley completely excavated the smaller south complex, but did not even map the northern portion of the site. He provides a good plan map of the architecture of the southern complex, and a fairly detailed account of the masonry and architecture, with emphasis on the description of kivas. Description of artifacts is cursory; examples of some of the complete mugs and bowls are illustrated, along with selected stone artifacts, including what appear to be several tchamahias, identified in the text as "ceremonial axes or skin-scrapers" (Morley 1908:607).

In format and information content, the report represents at most a modest improvement over Nordenskiöld's (1979). Morley's excavations appear to have been more systematic, but only whole or reconstructed artifacts are given any attention, there is no tabulation of artifacts by class and provenience, and there is no attempt to base any inferences on the horizontal or vertical distribution of artifacts or their patterns of association with types of structures. By and large, the inferences and interpretations that are offered are not closely tied to evidence from the archaeological record at the site, and there is no attempt to infer the chronological position of the site by comparison of its characteristics with those of other sites in the region. An exception to the general lack of analysis is Morley's reconstruction of building sequences based on wall abutments; from this he infers that the site grew by accretion over time as "daughters of the family grew to womanhood and drew husbands from other groups" (Morley 1908:600). The latter inference is based on his assumption that all the Pueblo people of his day practiced a "matriarchical system of descent" (Morley 1908:600) and (implicitly) that their prehistoric ancestors must have done the same and that this would therefore have required a matrilocal pattern of postmarital residence. According to Bruce Bradley (personal communication), a close analysis of Morley's published map indicates that the pattern of abutments does not fully support his inferred building sequence.

The tendency to base interpretations on often unstated ethnographic analogies and to relate them only weakly if at all to specific archaeological data from the site being examined characterizes most of the work of this period. Nowhere is this more evident than in the work of

Jesse Walter Fewkes, who excavated regularly at MVNP from 1908 into the 1920s, starting with his "excavation and repair" of Spruce Tree House (Fewkes 1909) and Cliff Palace (Fewkes 1911). Fewkes also showed a curious lack of interest in developing or applying systematic methods for constructing archaeological chronologies. Taylor (1954) has remarked on these attitudes as characteristic of what he called the "Cushing-Fewkes" period in Southwestern archaeology, which he places as between "around 1880" and 1911, when Kidder's "sherd survey" on the Pajarito Plateau signaled the start of the "time-space revolution" in Southwestern archaeology (Taylor 1954:561-563).

Taylor (1954) notes that work of this period was characterized by attempts to link living Indian cultures to their archaeological antecedents, though more often on an anecdotal basis than by detailed, systematic trait comparisons. Both Fewkes and Cushing had begun their work in the Southwest as ethnographers, and had been "led into archaeology by extension of their ethnographic interests" (Taylor 1954:561). There also was a failure to recognize the multiphyletic nature of archaeological materials, so that manifestations from throughout the Southwest were "attributed to a single undifferentiated culture, sometimes identified as Hopi, sometimes as Zuni, sometimes as generalized Pueblo....Observed differences were considered of little or no importance, overlooked, or attributed to environmental factors working upon a single unitary culture identified as Pueblo" (Taylor 1954:561).

Because both the modern and archaeological Pueblo cultures were seen as a unitary phenomenon, ethnographic data from anywhere in the Pueblo world could "...serve as explanation and reference for the archaeological problems. There was no need to work out intricate archeological analyses or laboriously to mull the details of provenience and association" (Taylor 1954:562). Finally, there was also a "lack of concern with temporal distinctions and the concept of time in general" (Taylor 1954:561).

Fewkes' reports on Spruce Tree House (1909) and Cliff Palace (1911) exemplify these approaches. He does provide site maps and brief descriptions of structures and selected artifacts, but the most of the interpretations are based on direct analogies drawn from his experience at Hopi. By 1908, Fewkes had decided that Mesa Verde kivas were essentially direct analogs of Hopi kivas, despite differences in size, architectural details, and relationship to surface room suites (Fewkes 1908; see also Lipe and Hegmon 1989:17-18 and Lipe 1989). For example, in his discussion of the kivas of Cliff Palace (Fewkes 1911:48-64), he notes: "They [the Cliff Palace kivas] belonged to the men of different clans, as in a measure is the case among the Hopi at the present day, with whom every kiva is spoken of as that of a certain man who is a clan chief....As the kiva is the men's room, and as religious exercises are largely controlled by the men, such ceremonies occur in kivas, which are practically the ceremonial rooms."

In considering why the kivas of the Mesa Verde are so much smaller than those at Hopi, Fewkes (1911:51) speculates that each kiva was used by only a few (clan?) chiefs, and that the larger religious fraternities such as those found at Hopi had not yet developed. He also notes that kivas are much more numerous relative to surface rooms in the Mesa Verde sites than at Hopi, and this leads him to propose an ingenious chronological theory. Kivas are thought to "preserve the oldest types of buildings in the cliff-dweller culture, and...the form of these archaic structures is a survival of antecedent conditions" (Fewkes 1911:48). Hence, sites where kivas are relatively more common are likely to be older than sites in which the frequencies of kivas more closely resemble the historic Hopi situation: "The larger the number of kivas relatively [sic] to secular rooms the older the ruin. Long House would be regarded as older than Cliff Palace, and Cliff Palace older

than Spruce-tree House, Balcony House being the most modern and the last of the four to be deserted" (Fewkes 1911:79).

Rather than take up the new methods for developing archaeological chronologies that became widely accepted in the years just prior to World War I, Fewkes continued in his later years to spin out speculative chronologies. For example, in a lecture on Mesa Verde archaeology given to the Anthropological Society of Washington in 1917, Fewkes was reported to have discussed the evolution of kivas from towers: "He regarded the tower as a religious building and that the people who used it lived in dugouts or temporary habitations that have disappeared. In the earliest times these two types were separated, but in later stages in the evolution of buildings they became united; at this time the habitations were constructed around the bases of the towers. Later in the course of development the central original building lost its tower-like form and became the circular kiva. Several similar architectural units, by union, formed a pueblo" (Anthropological Society of Washington 1917:313).

In summary, the exploration, documentation, and research done prior to 1912 focused almost entirely on manifestations of the Pueblo III period. The relationship of these sites to the Pueblo cultures of New Mexico and Arizona was recognized, and the notion that the region had been abandoned because of warfare with non-Pueblo people became widely accepted. A number of sites were mapped with varying degrees of accuracy, some were excavated, most of the major site types of the period were recognized, and the architecture was described in some detail. A full range of both perishable and imperishable Pueblo III artifacts were described and illustrated, and very general classes of pottery were recognized. Little progress was made in developing an archaeological chronology, perhaps because most work was confined to a single temporal period and because a unitary Puebloan culture was assumed, as described by Taylor (1954). A number of collections were made for museums, both popular and scientific articles began to be published, and the rich archaeological resources of the region became known not only to the scientific community but to the general public. A successful backlash against unregulated excavation and the development of a commercial market for southwestern artifacts resulted in the passage of the Antiquities Act and the establishment of MVNP. Despite the scientific deficiencies of Fewkes' excavations in the park, his efforts in stabilization and reconstruction made several of the major ruins accessible to visitors.

GROWTH OF AN ARCHAEOLOGICAL CHRONOLOGY: 1912-1927

This period starts with the initiation—in 1912—of Nelson's (1914, 1916) program of research in the Galisteo Basin, and ends with the publication of the Pecos Conference synthesis (Kidder 1927). During these 15 years, a sequence of Puebloan and pre-Puebloan periods was defined. The Archaic and Paleoindian periods remained outside the purview of researchers in the northern Southwest, as did the prehistory of the Numic-speaking peoples. Navajo archaeology received only brief mention in the published literature (e.g., Kidder 1920). Although Morris conducted fairly extensive research on historic Navajo sites in northern New Mexico in 1915 and 1917 (Lister and Lister 1968:15-18), the results were not published until after his death (Carlson 1965).

The "stratigraphic-chronological" revolution that took hold in Southwestern archaeology between 1912 and 1927 was oriented toward defining archaeological complexes that were distinctive to particular temporal periods. To a lesser extent, there was also a focus on recognizing regionally distinctive trait complexes. The success of these efforts depended on application of a

variety of archaeological methods, including 1) stratigraphic excavation (based upon natural layers or on arbitrary levels); 2) artifact and architectural typologies based on temporally sensitive style attributes; 3) documentation of artifact provenience in the field and maintenance of provenience control in the lab; 4) seriation of assemblages of ceramics (primarily on an intersite basis, but sometimes intrasite as well); 5) quantification of artifactual data, usually in the form of sherd counts by type; and 6) use of diagnostic artifact or architectural types to correlate individual sites or assemblages to positions within well-defined chronological sequences. Even without the absolute chronological positioning later provided by tree-ring and radiocarbon dating, these methods permitted the development of fairly fine-grained sequences and at least approximate time-stratigraphic correlation across regions. The application of some of these methods can be traced back to the previous period, and all of them underwent considerable additional refinement after 1927, but it is in this period that they came to be a standard part of the methods used by at least the more progressive researchers.

The key players in this development were Nels Nelson, A.V. Kidder, and Earl Halstead Morris. Nelson worked in the Rio Grande area in New Mexico (Nelson 1914, 1916). Kidder worked on the Pajarito Plateau in New Mexico (Kidder 1915); then with Samuel Guernsey in northeastern Arizona (Kidder and Guernsey 1919; Guernsey and Kidder 1921); then started his long campaign at Pecos in northern New Mexico (Kidder and Kidder 1917; Kidder 1917, 1924, 1962). Earl Morris worked in the La Plata district of southwestern Colorado and northwestern New Mexico (Morris 1917, 1919b, 1921a); at Aztec Ruin on the lower Animas River (Morris 1919a, 1921b, 1924a, 1924b); and elsewhere in the Four Corners area. The development of site seriation based on sherd frequencies from survey collections was also facilitated by the work of Kroeber (1916) and Spier (1917) at Zuni.

Nelson began working in the Galisteo Basin of northern New Mexico in 1912. Here, he pioneered the use of "metrical stratigraphy," excavating measured levels in midden areas. He was able to detect quantitative changes in pottery styles with depth; the next steps were to use quantitative profiles of type frequencies to correlate levels in middens from different sites and hence to build up a ceramic-style chronology for the Rio Grande region (Nelson 1914, 1916). In 1917, Madeleine and A. V. Kidder published a similar stratigraphically controlled sequence of pottery types from the early excavations at Pecos Pueblo, which Kidder had begun in 1915 (Kidder and Kidder 1917).

In 1914-1916, Samuel Guernsey and A. V. Kidder also used stratigraphic evidence to test Richard Wetherill's claim, based on observations in southeastern Utah, that distinctive Basketmaker cultural and physical remains underlay those of the cliff dwellers. Working in cave sites in the Tsegi Canyon–Marsh Pass area of northeastern Arizona, Guernsey and Kidder verified Wetherill's sequence, and further established the characteristics of the prepottery but agricultural Basketmaker culture (Kidder and Guernsey 1919; Guernsey and Kidder 1921). On the basis of stratigraphy and patterns of association among artifact and architectural types, they were also able to formulate a temporal sequence from Basket Maker, to Slab House, to Cliff-house culture (Kidder and Guernsey 1919). By the time of their next joint publication, a new period—Post-Basket Maker—had been recognized, and the name of the succeeding Slab House period changed to Pre-Pueblo (Guernsey and Kidder 1921). Thus a four-period sequence was established: Basket Maker, Post-Basket Maker, Pre-Pueblo, and Cliff-house.

In a brief paper published in 1917, Kidder surveyed the Puebloan development in the San Juan area as a whole, calling it the "great northern Kiva-culture" after one of its most distinctive

manifestations. He also recognized that at least in its later manifestations, San Juan Puebloan culture had several regional variants that could be distinguished on the basis of pottery and kiva styles, i.e., Kayenta, Chaco, and Mesa Verde-McElmo-Montezuma (Kidder 1917).

In this same period, Earl Morris began fieldwork in several parts of the Four Corners area, and made a number of published contributions to the developing cultural chronology (the triumphs and failures of his incredibly energetic and peripatetic research career are chronicled by Lister and Lister [1968]). A native of northern New Mexico, Morris grew up in Farmington, took his Bachelor's degree at CU and did graduate studies at Columbia University. A versatile and resourceful man, he was arguably the most perceptive and technically skillful field archaeologist the Southwest has produced.

Morris worked in several parts of the northern Southwest during this period, but the major field projects that have a bearing on the study area were in 1913 and 1914 in southwestern Colorado (Morris 1919b) and at Aztec Ruin on the lower Animas in New Mexico from 1916 through 1921. His 1913-1914 fieldwork focused on cliff dwellings in Johnson Canyon drainage, just south of MVNP, as well as on a number of open sites in both the Mancos and La Plata drainages. From excavations in the latter sites, Morris (1919b) documented a number of "Pre-Pueblo" sites having jacal rather than masonry surface structures and pottery that differed from that of the cliff dwellings. At Aztec, in addition to excavating and stabilizing the monumental West Ruin, Morris recognized two periods of occupation, an initial occupation related to the Chaco culture, when most of the structure had been built, and a later Mesa Verde occupation (Lister and Lister 1968:42-46). The Listers also provide an excellent popular history of Aztec Ruin (Lister and Lister 1987) and a thorough administrative history of the site's archaeology and its development as a national monument (Lister and Lister 1990).

Morris (1921a) published the first chronological outline for the San Juan area as such, correlating his findings with the Kidder and Guernsey (1919) three-period sequence, but replacing the Cliff-house period with two periods based on pottery characteristics. His sequence for the San Juan was: I. Basket Maker, II. Pre-Pueblo, III. Early Black-on-white, and IV. Late Black-on-white. Morris (1921a:19-21) attempted to characterize the physical type, pottery (or lack of it) and architecture for each period. He also used generalized pottery styles to link the later part of his San Juan sequence with Nelson's sequence for the Rio Grande (Morris 1921a:22). This was a refinement of an earlier attempt to link the San Juan and Rio Grande pottery sequences (Morris 1917). In the 1917 paper, Morris also established a chronological sequence of low-relief neck-banded pottery (what would today be called Moccasin Gray) to high-relief neck-banded (i.e., Mancos Gray) to corrugated pottery (i.e., Mancos, Dolores, and Mesa Verde Corrugated).

As Morris was completing his last two years of excavation at Aztec, Neil Judd was initiating his 1920-1927 campaign of work in Chaco Canyon. Morris, Judd, Kidder, and Nelson were of course aware of one another's work, and were frequently in contact. For example, Morris worked with Nelson in the Galisteo Basin during the summer of 1915; Nelson recommended that Morris initiate excavations for the AMNH at Aztec in 1916; and Nelson assisted in some of the fieldwork at Aztec in that year (Lister and Lister 1968:14-15, 24, 25).

While Nelson, Kidder, Morris, and others were revolutionizing the practice of archaeology in the Southwest, Fewkes continued much as he had before—"clearing" entire sites at MVNP and "repairing" them with only cursory reporting of the work, accompanied by speculative interpretations. This kind of treatment was accorded Sun Temple, Oak Tree House, New Fire

House, Far View House, Far View Tower, Cedar Tree Tower, Pipe Shrine House, and other sites. (e.g., Fewkes 1916a, 1916b, 1917, 1920, 1921, 1922, 1923a). In 1919, Fewkes published a monograph on the "Prehistoric Villages, Castles, and Towers of Southwestern Colorado" (Fewkes 1919). This was a reconnaissance of Pueblo III sites, rather in the manner of Jackson and Holmes (although with poorer maps), with emphasis on those having standing masonry structures. This and subsequent surveys by Fewkes contributed to the establishment of Hovenweep National Monument in 1923, so that selected canyon-head tower complexes on both sides of the Colorado-Utah border could be given special protection (Fewkes 1923b).

Also in southwestern Colorado in the early 1920s, Jeancon and Roberts were initiating work in the Chimney Rock area of the Piedra drainage for the Colorado State Historical and Natural History Society (now the CHS) (Jeancon 1922; Jeancon and Roberts 1923; Roberts 1922, 1925). Florence Lister (1993) summarizes this work in an excellent review of archaeological work in the Piedra region. Excavations at Chimney Rock Pueblo led Jeancon to recognize its similarity to the larger great houses of Chaco Canyon and Aztec (Lister 1993:17). The work of Jeancon and Roberts also defined a number of other types of sites and structures in the region, many of which differed significantly from the large masonry sites, cliff dwellings, and towers that had so far captured most attention in the McElmo and Mesa Verde regions farther west. This work also set the stage for Roberts' return to the area for a season of excavations in 1928 that focused on the earlier part of the Pueblo sequence (Roberts 1930).

The year 1924 was notable for publication of Kidder's *Introduction to the Study of Southwestern Archaeology* (Kidder 1924), which in addition to being a report on the initial seasons of excavation at Pecos Pueblo in New Mexico, also provided the first detailed regional cultural/chronological synthesis in American archaeology (Rouse 1962:1). In his synthesis, Kidder devoted the greatest amount of space to the San Juan drainage, the archaeologically best-known part of the Southwest. For the San Juan, he presented a temporal sequence that followed the Guernsey and Kidder (1921) four-period scheme, but characterized them in terms of progressive development of pottery: 1) sites with well-developed pottery (Pueblo ruins), 2) sites with less-developed pottery (pre-Pueblo ruins), 3) sites with crude pottery (post-Basket Maker ruins), and 4) sites with no pottery (Basket Maker sites) (Kidder 1962:166).

As in his 1917 paper, Kidder described areal differences within the San Juan culture only for the latest period, but provided much more descriptive detail, especially of architecture and pottery. The three cultural divisions he recognizes are Mesa Verde, Kayenta, and Chaco. Although no accurate absolute chronology had been developed at that time, he correctly estimated that the main buildings at Chaco Canyon dated to A.D. 800-1100, based on Spinden's assignment of dates to "Toltecan" pottery found there (Kidder 1962:340).

In his discussion of the Pueblo period, Kidder devotes 25 pages to the Mesa Verde cultural manifestation (Kidder 1962:190-214). In addition to the cliff dwellings, he recognizes the compact canyon-head pueblos such as Cannonball Ruins as typical late Mesa Verde sites, and suggests that this culture province extends west from Mesa Verde at least to Alkali Ridge in southeastern Utah, and perhaps as far as the Colorado River (Kidder 1962:205-207). He notes that late Mesa Verde pottery is present at Aztec Ruin just north of the San Juan River and in certain rooms at Pueblo Bonito in Chaco Canyon well south of the San Juan (Kidder 1962:205). He also recognizes a "proto-Mesa Verde" pattern for the early part of the Pueblo period. This episode is distinguished by minor differences in pottery, by poorer masonry, and by settlements based on Prudden's unit-type pueblos, either occurring singly, or in loose aggregations: "Such settlements

are easily distinguishable from the compact Mesa Verde type pueblos that occur in the same range, by the fact that they are usually built in the open country rather than about canyon heads, by their straggling arrangement, mediocre masonry, lack of towers, and particularly by their somewhat less specialized pottery....It is difficult to escape the conclusion that the three classes: unit type, multiple unit type, Mesa Verde type, are all parts of a single cultural sequence of which the Mesa Verde remains are the culmination" (Kidder 1962:213-214).

The interest aroused by Kidder's 1924 synthesis, as well as the growing amount of information from fieldwork and publications, led to a gathering of Southwestern archaeologists in 1927 at Kidder's field camp at Pecos. Kidder (1927:489) organized the conference, which had as its purposes "...to bring about contacts between workers in the Southwestern field; to discuss fundamental problems of Southwestern history, and to formulate plans for coordinated attack upon them; to pool knowledge of facts and techniques, and to lay foundations for a unified system of nomenclature."

In the report of the conference, Kidder (1927:489) lists 42 attendees; Woodbury (1993:20), working from photographs and other records, lists 46, but notes that several spouses and younger family members who attended remain to be identified. This group included several students, as well as some professionals (e.g., A.L. Kroeber, Leslie Spier) who were not primarily Southwestern archaeologists. Of the practicing Southwesternists, several (Hewett, Kidder, Morris, Nusbaum, Morley, Roberts) had substantial field experience in the Mesa Verde region.

The principal and most lasting result of the conference was the "Pecos classification," a sequence of cultural stages similar to but more detailed than Kidder's 1924 San Juan sequence, and one that was hoped to be of broad application in the Southwest. The stages and their diagnostic criteria as set forth by Kidder (1927:490) are as follows:

- *Basket Maker I, or Early Basket Maker*—a postulated...stage, pre-agricultural, yet adumbrating later developments.
- *Basket Maker II, or Basket Maker*—the agricultural, atlatl-using, non-pottery-making stage...
- *Late Basket Maker, Basket Maker III, or Post-Basket Maker*—the pit- or slab-house-building, pottery-making stage (the three Basket Maker stages were characterized by a long-headed population, which did not practice skull-deformation).
- *Pueblo I, or Proto-Pueblo*—the first stage during which cranial deformation was practiced, vessel neck corrugation was introduced, and villages composed of rectangular living-rooms of true masonry were developed...
- *Pueblo II*—the stage marked by widespread geographical extension of life in small villages; corrugation, often of elaborate technique, extended over the whole surface of cooking vessels.
- *Pueblo III, or Great Period*—the stage of large communities, great development of the arts, and growth of intensive local specialization.
- *Pueblo IV, or Proto-Historic*—the stage characterized by contraction of area occupied; by the gradual disappearance of corrugated wares; and, in general, by decline from the preceding cultural peak.
- *Pueblo V, or Historic*—the period from 1600 A.D. to the present.

The diagnostic criteria selected for this scheme were both culture-historical and "developmental." That is, some characteristics, such as the presence or absence of corrugated

pottery, represented stylistic changes that took place more or less contemporaneously within a single cultural tradition or series of related cultural traditions. On the other hand, the appearance of agriculture, pottery, and settled villages is generally characteristic of what later came to be called the "Neolithic Revolution"; these traits link the Southwestern sequence with many others elsewhere in the world. Other aspects of the scheme are even more generalized, and appear to represent implicit assumptions about the development of preindustrial societies. Hence, large settlements follow small ones, but growth may also be followed by a decline (e.g., Pueblo III was the "peak"). (Research in the Southwest and in many other areas of the world have repeatedly shown that "developmental" characteristics of the sort incorporated in the Pecos Classification are usually not very precise chronological indicators, because they may vary with local population density, environmental setting, or other factors, even within the same area and cultural tradition. In general, stylistic characteristics provide more uniform chronological indicators and period determinants.)

The Pecos Conference was a landmark event in Southwestern archaeology. It consolidated the gains in developing a regional chronology that had been made over the preceding 15 years, established a tradition of regular communication among the increasing number of archaeologists working in the Southwest, and identified some of the research questions and data needs that would occupy Southwestern archaeologists in the coming decades.

The widespread acceptance of the Pecos classification also promoted a view of gradual, uniform, progressive, change in Southwestern societies that to some extent hampered recognition of the often discontinuous and episodic nature of cultural, social, and demographic change in the region (see Berry 1982). Furthermore, the conference also established several other concepts that have until recently resisted empirical analysis. First was the reference to even small sites (e.g., single unit-type pueblos) as "villages." In fact, in the study area, such small settlements usually represent the residence of only one or a few families, and are usually part of a dispersed community. The term "village" more accurately applies to the loosely to tightly aggregated communities that occur in some times and places (see Varien et al. 1996; Wilshusen 1991; Varien 1997). Second was the enshrinement of Fewke's (1908) view of the San Juan kiva as "a chamber specially constructed for ceremonial purposes" (Kidder 1927:490). The problem is not that a functional definition was adopted, but that there was no indication of how this function might be recognized in terms of particular behaviors that left particular kinds of archaeological evidence. In both the conference discussion and in subsequent practice, it was assumed that some combination of stylistically distinctive architectural features would be sufficient to identify the "ceremonial purpose" of such structures (see Lipe 1989; Lekson 1988; Varien and Lightfoot 1989).

The conference report ended with an account of A. E. Douglass' appeal for the help of field workers in gathering wood samples for the tree-ring chronology he was attempting to develop. This was a topic of great interest at the time, and Douglass had already succeeded in the relative dating of some sites by reference to a "floating" chronology (Lister and Lister 1968:40). Two years after the Pecos Conference, the gap between the historic and prehistoric chronologies was bridged (Douglass 1929), ushering in a new era in Southwestern archaeological chronology-building.

TAXONOMIC SYSTEMS AND GAP FILLING: 1927-1957

This period starts with the Pecos Conference of 1927, and ends 30 years later with the initiation of several large research projects that also served as the vehicles to introduce new types of theoretical and methodological interests in the study area and the Four Corners area in general.

The methodological emphasis in the period 1927-1957 was on the development and application of systems for classifying archaeological materials and arranging them along the dimensions of time, space, and cultural relationship (e.g., Spaulding 1960). This was characteristic of American archaeology as a whole, but workers in the Southwest played a leading role, including those focusing on the archaeology of the Four Corners area. The hallmarks of this approach were 1) typological classification of artifacts, features, and architecture, usually with the type diagnostics selected to be sensitive to variation in time, space, or cultural affiliation (e.g., Kriegerian or "historical" types [Krieger 1944; Rouse 1960]); formal typological systems were constructed for ceramics, with generally accepted conventions for standardizing nomenclature; 2) definition of archaeological culture units (e.g., phases) reflecting characteristic associations of types confined to particular periods and regions (Trigger 1978:75-95; Rouse 1955), with heavy weighting given to the types most sensitive to time-space variation; 3) plotting culture units in time and space to form regional phase sequences, and also grouping phases into larger-scale entities such as "branches" or "stems" thought to be reflective of enduring cultural traditions.

The theoretical emphasis of archaeological research during this period was on writing culture history in the Boasian sense—that is, on accounting for how the traits (types) of a particular culture unit became assembled through the operation of historical processes such as invention, loss, contact, diffusion, drift, and migration (see Aberle 1960; Trigger 1968:26-47). Such analyses were also expected to support broader inferences about historical relationships among culture units, including how they had developed and influenced one another through time. In practice, most of the work was devoted to establishing types and phases, correlating them with the Pecos stages, and arranging the phases in various space-time-culture frameworks to establish a kind of "cultural stratigraphy" for the Southwest. Taylor (1948:95) criticized this as the "comparative approach," which treated archaeological sites and components as internally uniform entities, and placed the emphasis on comparing them to form historically distinctive cultural units such as phases, rather than on using intrasite comparisons and functional interpretation to understand prehistoric lifeways and behavior. Later, the "new archaeologists" also criticized this approach for its "normative" assumptions and consequent lack of attention to cultural variation associated with social segmentation and with flexible adaptive strategies (e.g., Binford 1962, 1964). Although these criticisms are warranted, the development between 1927 and 1957 of systematic methods for defining temporally sensitive artifact types and for building regional phase sequences was a significant accomplishment.. Types and phases continue to be important tools in archaeological research, although in more recent periods, their delineation has generally become subsidiary or at least complementary to other research goals.

During this period, the Pecos Conference stage scheme also continued to be used, but its application was increasingly confined to the San Juan drainage. It had become clear soon after the Pecos Conference that the proposed stages did not apply very well in the southern Southwest. Consequently, at a meeting in Globe, Arizona in 1931, the Hohokam culture was proposed as a tradition separate from the Basket Maker–Pueblo culture, and a different sequence of temporal stages was established for Hohokam (Brew 1946:40-41). In addition, a third major tradition—the Mogollon—was proposed by Haury (1936a) for the mountainous Mogollon Rim area between the

Plateau and the Basin and Range provinces of the Southwest. Minor modifications to the scheme were also proposed by Roberts (1935), along with new labels emphasizing its developmental aspects, e.g., Basket Maker (for Basket Maker II), Modified Basket Maker (for Basket Maker III), Developmental Pueblo (for Pueblo I and II), Great Pueblo (Pueblo III), Regressive Pueblo (Pueblo IV) and Historic Pueblo (Pueblo V). As archaeologists increasingly developed fine-grained, regional period or phase sequences, the Pecos stages tended to be used primarily as a general framework of periods that cross-cut the regional sequences and that could be used for generalized temporal correlations.

In the Southwest, schemes for defining and relating cultural units initially took the form of hierarchical taxonomies, following proposals by Gladwin and Gladwin (1934) and Colton (1939). The lowest level classificatory unit in the Gladwins' scheme was the phase, and in Colton's, the focus—a term borrowed from the conceptually quite different Midwestern Taxonomic System (McKern 1939). Both Colton's focus and the Gladwins' phase, however, were conceptually similar, and operationally, were defined largely on the basis of time-sensitive pottery types, with other cultural characteristics added as nondiagnostic parts of the phase description. "Phase" continues to be a staple of archaeological systematics today. The most widely accepted definition of a phase is the one provided by Willey and Phillips (1958:22): "...an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a region and chronologically limited to a relatively brief interval of time." This definition is consistent with Southwestern practice as it developed in the 1930s and 1940s, although it is derived from an earlier statement by A.V. Kidder in one of his Mesoamerican publications (Willey and Phillips 1958:22).

The multilevel classificatory schemes proposed both by the Gladwins and by Colton placed phases/foci in hierarchical groupings that had phylogenetic implications. So, for example, Gladwin and Gladwin (1934:Figure 8) placed the Mesa Verde cliff dwellings (and presumably other contemporary site types in the region) in the Montezuma phase of the Mesa Verde branch of the San Juan stem of the Basketmaker Root. Brew (1946:44-66), in his well-known essay on "The Use and Abuse of Taxonomy," properly criticized this approach for forcibly segmenting continuous cultural variation by imposing rigid typological categories, and for ignoring diffusion by assuming that a branching or phylogenetic model was applicable to cultural history. Although Gladwin and Gladwin (1934) and O'Bryan (1950) attempted to fit the phases of the Mesa Verde region into a hierarchical scheme, other workers (e.g., Martin 1936; Brew 1946) were content just to name and describe one or more phases for their research areas. Others (e.g., Morris 1939) continued to find the Pecos periods adequate for classifying the archaeological manifestations they encountered.

Typological classifications of pottery proliferated during this period. These generally were designed to sensitively map temporal change in design and technology; hence they could be called "historical" types in Rouse's (1960) terminology. An added feature of Southwestern pottery types was that they also were expected to reflect cultural traditions. As with cultural units, hierarchical, phylogenetic taxonomies were set up for pottery, with types being grouped into wares and series, with generally accepted rules for nomenclature and description (Colton 1953:51-58). Formal type descriptions for various areas of the northern Southwest began to be published in the 1930s (e.g., Hargrave 1932; Colton and Hargrave 1937; Mera 1932, 1933, 1935; Hawley 1936, Martin 1936). Descriptions of pottery types for the Mesa Verde branch remained scattered in the literature until the 1950s, when Abel (1955) compiled existing information to provide standard

descriptions for previously named types, and also named and described several new types to flesh out the pottery sequences for the Mesa Verde region. He also sorted the Mesa Verde types into wares, primarily on the basis of tempering material, firing environment, and surface treatment (e.g., Mesa Verde White Ware, San Juan White Ware, Mesa Verde Gray Ware, and San Juan Red Ware). This was part of the Museum of Northern Arizona's program of providing systematic type descriptions for the entire northern Southwest. Abel's treatment has been largely superseded by a manual compiled by Breternitz et al. (1974), which in turn has been refined by Wilson and Blinman (1991).

The potential of tree-ring dating had begun to be recognized in the 1920s, with the construction of prehistoric "floating" chronologies that permitted the relative chronological placement of a few sites. With the closing of the gap between historic and prehistoric ring sequences in 1929 (Haury 1986), beam samples from archaeological sites could now be assigned actual calendar dates, and samples collected in earlier years could be "tied in" to the new chronology. Work in the study area during this period added greatly to the construction of a robust chronology that extended back to the early centuries A.D. The abundance of tree-ring dates from southwestern Colorado enabled newly defined phases and pottery types to be assigned calendar dates with a degree of precision equaled in few other regions of the Southwest, let alone the rest of North America. The combination of tree-ring dating with seriation of pottery and architectural styles has enabled increasingly fine grained chronologies to be developed in the study area in subsequent periods.

The tree-ring record also provided evidence of past fluctuations in rainfall; reconstructing climatic change had been Douglass' initial motivation in developing a tree-ring sequence. Once the chronology had been extended back to link with the archaeological record, it was possible to attempt to correlate cultural changes with past fluctuations in rainfall and hence variations in conditions for agriculture. Despite the attractive possibilities thus presented, most archaeologists focused primarily on the tree-ring record as a dating tool. The most prominent exception to this was the widely accepted correlation of the "great drought" of 1276-1299 with the end of the Pueblo III period and the movement of people out of the Four Corners area (e.g., Douglass 1929). Roberts (1937:14-15) reviewed the tree-ring record of droughts and moist periods from the late A.D. 700s through the 1200s in relation to the growth of large settlements in the San Juan drainage, but did not find clear relationships. Elsewhere in the Southwest, work was beginning on the relationships between alluviation, arroyo-cutting, and prehistoric settlement (e.g., Bryan 1941; Hack 1942). In the study area proper, however, little attention seems to have been paid to paleoenvironmental reconstruction during this period.

During the period 1927-1957, substantive research agendas in the study area (as elsewhere in the Southwest) were driven by what Taylor (1954) has called "gap-filling," i.e., focusing work on regions or temporal periods that were little-studied or poorly understood. Archaeological research in southwestern Colorado continued to focus almost entirely on filling temporal and spatial gaps in the familiar Basketmaker–Pueblo tradition. By the end of the period, however, workers elsewhere in the Southwest were beginning to define various pre-Basketmaker and non-Puebloan manifestations (for example, studies in northern New Mexico were beginning to provide some systematic documentation of Navajo archaeology [e.g., Hall 1944a; Keur 1941; Riley 1954]).

Between 1927 and 1957 in Southwestern Colorado, numerous reports were published on excavations in sites ranging from the Basketmaker II through Pueblo III periods. In the Durango

area, Morris and Burgh's excavations at the Fall Creek shelters and at Talus Village documented a variant of Basketmaker II culture that differed somewhat from the "classic" manifestations reported by Kidder and Guernsey from northeastern Arizona. The Durango area excavations also provided the first good evidence of Basketmaker II houses, as well as a variety of features and large assemblages of stone tools from controlled excavations in tree-ring-dated contexts (Morris 1949; Morris and Burgh 1954; Lister 1997).

Roberts' (1930) report on work in the Piedra drainage focused primarily on sites of the Pueblo I period. It provided detailed descriptions of architecture and artifacts from several single component sites, providing a good basis for characterizing both the general characteristics of this period in the northern San Juan and for recognizing traits peculiar to the Piedra region. Roberts also briefly synthesized earlier work in the region done with Jeancon.

In the Ackmen-Lowry area northwest of Cortez (Monument–McElmo drainage unit), Paul Martin and others carried out a productive excavation campaign, first under the auspices of the CHS (Martin 1929, 1930) and then for the Field Museum of Natural History in Chicago (Martin 1936, 1938, 1939) . Martin excavated in a number of sites ranging from Basketmaker III to Pueblo III, but his most important contributions were the excavation of Lowry Ruin (Martin 1936) and the documentation of Pueblo I and II architectural and artifactual sequences in the Ackmen locality (Martin 1938, 1939). At Lowry, which yielded tree-ring dates in the late A.D. 1000s and very early 1100s, Martin and Lawrence Roys (who established a masonry typology) recognized the Chacoan character of the masonry and great kiva architecture of the initial building phase, and were able to use wall abutments and superposition of walls and of masonry styles to work out the architectural history of the site. Martin (1939) and Rinaldo (1939) report on "modified Basket Maker" sites, but the tree-ring dates, architecture, and pottery styles place these squarely in the Pueblo I period.

Morris' (1939) classic report on the La Plata region provided brief descriptions of excavations undertaken between 1915 and 1930 at 21 sites in Colorado and New Mexico, as well as lengthy descriptions of pottery and other artifacts keyed to the Pecos periods. Morris for the most part eschewed typological designations for the pottery, preferring to discuss continuity and change through time in selected attributes. Anna Shepard (1939) contributed an appendix on the technology of the pottery, which was typically "ahead of its time" in terms of the discipline and sophistication of the analysis. Morris' report is best known for the synthesis of San Juan area prehistory (Morris 1939:1-45) that he provided in order to place the La Plata results in context. Bucking the prevailing fascination with cultural taxonomy and phase sequences, he synthesized cultural variation and dynamics through time and space, using the framework provided by the Pecos periods.

Excavations in Mesa Verde National Park are reported by O'Bryan (1950) and by Lancaster and others (Lancaster and Watson 1943; Lancaster et al. 1954). O'Bryan described excavations at four sites, some with multiple components, and assigned the components and associated architecture and artifact assemblages to phases: Four Corners (ca. 550-700); Chapin Mesa (ca. 700-900); Mancos Mesa (ca. 900-1050); McElmo (ca. 1050-1150); and Montezuma (ca. 1150-1300). Lancaster et al. (1954) report excavations at two late Basketmaker III pithouses, several Pueblo II (and III?) components at Site 16, and a poorly preserved Pueblo III site—Sun Point Pueblo. The report includes an account of the gradual development of the Mesa Verde kiva from origins in the domestic pithouses of Basketmaker III through a series of architectural elaborations in the Pueblo II and III periods (Lancaster et al. 1954:53-61). This parallels Brew's

(1946) analysis, in which the formal details of architectural change from Basketmaker III pithouses through Pueblo I "proto-kivas" to Pueblo II and III "kivas" are considered to be indicative of changes in function from fully domestic to specialized ritual use (Brew 1946:203-214; also see Lipe and Hegmon 1989). The excavations reported in Lancaster et al. (1954) remain open under roofs and serve as mesa-top exhibits on Chapin Mesa at MVNP.

During the period 1927-1957, less detailed reports were published by Erik Reed on work in several Pueblo I-III sites in the Mancos Canyon (Reed 1944, [but see his more extensive monograph published in 1958]). Leonard Leh (1938, 1939, 1940, 1942) reported on Pueblo II and III contexts at the Wilson or Monument ruins on the Colorado-Utah border. (Prior to Leh's work, this complex was generally known as the Bug Point Ruins; in recent years, the complex has been acquired by the Archaeological Conservancy and renamed the Hedley Ruins). Guthe (1949) and Tobin (1950) published brief articles on excavations in late Pueblo II contexts at the Cahone Ruin (now Ansel Hall site). Joe Ben Wheat (1955a) reported briefly on Basketmaker III excavations near Yellow Jacket.

Although what would come to be called Archaic stage components were discovered in Montrose County north of the study area during this period (Hurst 1945) as well as in the Rio Grande area of New Mexico (Bryan and Toulouse 1943; Campbell and Ellis 1952), they were not reported from southwestern Colorado. Paleoindian remains were also discovered in the southern Southwest (Haury et al. 1953), but not in the study area.

A formal state program for assigning site numbers and keeping archaeological survey records was begun in the early 1950s, under the sponsorship of CU. In the early 1950s, Joe Ben Wheat, the curator of anthropology at the University of Colorado Museum, assigned the first site numbers in Montezuma County to several sites near the head of Yellow Jacket Canyon, including the extremely large "Surouaro" or Yellow Jacket ruin that had been noted by Newberry in 1859, nearly a hundred years earlier. This site was assigned the number 5MT5.

With a few exceptions, the research undertaken during this period was explicitly designed to "fill gaps" (Taylor 1954). Theoretically and methodologically, the resulting reports reflect Taylor's (1948) characterization of the "comparative method." Sites are considered as components of phases or periods (even if these terms are not always used). As such, they provide examples of the architectural and artifact styles or types that characterize those phases or periods. Although some reports devote considerable space to architectural evidence of building sequences, artifact occurrences are almost never reported quantitatively or by provenience; if intrasite distributions are reported at all (e.g., in Lancaster et al. [1954]), proveniences are defined at the most general level (e.g., by structure or site area, and sometimes by "floor" versus "fill" within rooms).

Research in the study area and adjacent parts of the Four Corners area between 1927 and 1957 resulted in the development of a much more detailed framework than had previously existed of dated phases and periods, with associated types of architecture, features, and artifacts (especially pottery). Refining phase schemes and chronologies has continued to be an important concern in the study area, as elsewhere in American archaeology.

Although the taxonomic schemes that flourished during this period established a segmentation of time, space, and cultural variation, there appears to have been an implicit assumption that occupation was continuous and change was gradual through both time and space

within the study area. The underlying theoretical model, however, was of change from one type (of whole cultures or of artifacts) to the next (see discussions in Lyman et al. 1997). Implicitly, types were considered to represent ideal or essential expressions of culture; phase or type boundaries were drawn more or less arbitrarily between the presumed "best" (i.e., closest to the essential) manifestations of these units. This conceptual scheme did not promote the development of really fine grained chronologies of the sort needed to track the dynamic histories of populations or social groups, as opposed to "cultures."

SETTLEMENT PATTERNS, CULTURAL ECOLOGY, AND SALVAGE ARCHAEOLOGY: 1957-1974

This period starts with the initiation of two very large archaeological projects—the Navajo Reservoir salvage project, which began in 1956 and the Wetherill Mesa project, which began in 1958 and was focused on excavating sites that were expected to become public exhibits in MVNP. In addition, another massive reservoir salvage project began in 1957 in southeastern Utah, on the western edge of the Mesa Verde culture area. Hence the year 1957 seemed an appropriate dividing line between this period and the previous one. The period ends in 1974 with the "Denver Conference" (Lipe and Lindsay 1974), which signaled the shift from salvage archaeology to "cultural resource management" (CRM) as a response to the threatened destruction of archaeological sites by various kinds of development.

In the study area, this period was characterized by the growth of salvage archaeology, and by new methodological and theoretical orientations, including settlement pattern studies and the use of cultural ecology as an overall orienting theoretical framework. In addition, a number of high-quality, detailed site reports were published, pottery type definitions and dates were refined, and extensive public land surveys began to be conducted as tribes and federal land-managing agencies began to comply with provisions of the National Historic Preservation Act (NHPA) of 1966. The Ute Mountain Ute Tribe also set aside a very large area of land as a tribal cultural park, and through the Bureau of Indian Affairs began to contract for archaeological surveys, salvage excavations, and ruins stabilization projects related to developing visitor access to the park.

The taxonomic and chronology-building emphases that developed in the previous period remained important in most of the research done in the study area between 1957 and 1974. The new methodological and theoretical emphases of this period were related, however, to changes taking place in American and Southwestern archaeology in general. Criticisms of American archaeology's heavy preoccupation with taxonomic systems and chronology had begun midway through the previous period, e.g., by Steward and Setzler (1938) and Kluckhohn (1940). Taylor's (1948:45-94) scathing critique of the assumptions and standard operating procedures of Americanist archaeology included attacks on such Southwestern icons as A. V. Kidder, Frank H. H. Roberts, and Emil Haury. These critics did not dismiss the need for classification and chronology building, but argued that they were means to be employed in the pursuit of broader anthropological questions, and not ends in and of themselves. Taylor (1948:152-202) argued that it was possible for archaeologists to infer much more about the life and culture of the people they studied by employing the "conjunctive approach." At the primary level, this involved intensive intrasite analysis of the spatial distributions of remains of all sorts, including nonartifactual materials such as faunal and plant specimens; it required viewing artifacts, features, and other specimens functionally rather than just as chronologically sensitive normative types; and it required understanding how the archaeological record had been formed as a result of human and nonhuman agencies at particular sites. Taylor furthered a portion of this agenda by editing an

influential symposium on the analysis of nonartifactual remains, conducted under the auspices of the National Academy of Sciences (Taylor 1957).

Julian Steward's "cultural ecology" (e.g., Steward 1938, 1955) also became increasingly influential in American archaeology in the 1950s, and this clearly affected research directions in the study area (although the influence was often unattributed). Steward argued that the interface between culture and the environment was the most productive starting point for the analysis and functional interpretation of particular cultures and their social arrangements. "Level of sociocultural integration" also had to be taken into account: e.g., state-level societies would adapt to a given environment differently than would bands or tribes. Steward, both personally and through his theoretical work, influenced Willey's (1953, 1974) pioneering settlement pattern studies. By focusing attention on the spatial distribution of settlements as indicators of which resources and social relationships were most important to a society, settlement pattern studies provided a platform for analyzing social organization (e.g., Chang 1958) as well as subsistence systems and mobility (e.g., Jennings and Norbeck 1955).

In the early 1960s, the "new archaeology" burst on the scene (Binford 1962, 1964). This owed an at least implicit debt to Steward, but was more explicitly related to Leslie White's ideas about cultural adaptation to the environment and the evolution of social organization; it also incorporated a structural-functionalist view of society, recast in the terminology of systems theory (see Wood and Matson 1973). Certainly it was the latter aspect that set the agenda for the pioneering applications of the new archaeology in the Pueblo Southwest (e.g., Longacre 1964; Hill 1966). In the early and middle 1960s, proponents of the new or "processual" archaeology tended to view each "socio-cultural system," together with its regional environment, as an independent unit of analysis; to locate sources of change in the environmental interface rather than in conflicts of interest among individuals or groups; and to downplay, ignore, or explicitly reject the possibility that interregional migration and diffusion could bring about social and cultural change.

These developments thus helped define the intellectual context in which archaeology was conducted in the study area between 1957 and 1974. Either directly or indirectly, this context helped promote greater attention to paleoenvironmental studies, analysis of faunal and floral remains, documenting and analyzing inter-site distributions of artifacts, use of survey as a research tool rather than just a way to find sites that could be excavated, estimation of population size, study of a full range of site types, and inferences about social groups and social organization. In addition, systematic work on Navajo archaeology was begun in the Colorado-New Mexico border area (Hester and Shiner 1963). Although evidence of Archaic stage occupation was increasingly being documented in areas adjacent to southwestern Colorado, no Archaic components were excavated in the study area during this period. Dittert et al. (1961) report that several probably Archaic sites were encountered in the Navajo Reservoir area surveys, and other sites of this period were identified from surface evidence near the San Juan River not far southwest and south of the study area (Mohr and Sample 1959; Sample and Mohr 1960).

Navajo Reservoir is located in the Upper San Juan-Piedra drainage unit and occupies portions of the Pine, upper San Juan and Piedra river valleys south and southeast of Ignacio, Colorado. It is largely in New Mexico, but the San Juan-Piedra arm of the reservoir extends into Colorado near Arboles. The reservoir was constructed by the Bureau of Reclamation as part of its Upper Colorado River Storage project, which also included damming the Colorado River to form Lake Powell, and other reservoir construction projects in the upper Colorado drainage basin.

Water from Navajo Reservoir is now supplied through canals to support farming on the Navajo Indian Irrigation Project lands south of Farmington, NM.

Fieldwork for the Navajo Reservoir Archaeological Salvage project began on a small scale in 1956 and continued through the summer of 1964 (Eddy 1966). A number of monographic publications resulted (Dittert 1958; Dittert and Eddy 1963; Dittert et al. 1961, 1963; Eddy 1961, 1966, 1972; Harris 1963; Hester and Shiner 1963; and Schoenwetter and Eddy 1964) as well as numerous journal articles (see reference lists in Eddy 1972 and 1974). The project made a number of substantive contributions to the prehistory of the study area, in addition to introducing new methods and theoretical orientations.

Workers on the project established a new phase sequence for the area, starting with the Basketmaker II period Los Pinos phase, and continuing through several early Pueblo period phases, followed by a long occupational hiatus, and then the Navajo Gobernador phase and the historic Spanish-American Lucero phase (Eddy 1966:470). Although the definition and chronology of some of these phases may need modification in the light of new information (see discussions in Chapters 6 and 7, this report) the project represented a significant advance in archaeological understanding of the pre-Pueblo II portions of the Basketmaker-Pueblo sequence in the study area and adjacent portions of New Mexico. One of the contributions of the project was the systematic attempt to reconstruct past environments, with emphasis on the parameters having greatest relevance to prehistoric cultural adaptations. A combination of faunal analysis (Harris 1963), palynology of alluvial and archaeological contexts, and alluvial geology (Schoenwetter and Eddy 1964) yielded inferences about variation in amounts and seasonal distribution of effective moisture, as well as periods of alluviation and degradation of flood plains.

Two volumes of the Navajo Reservoir project monograph series were devoted to Navajo archaeology. Hester and Shiner (1963) reported on excavations at a number of Navajo sites and summarized architectural and material culture inventories and variation. Hester (1962) also published a synthesis of archaeological and relevant historical evidence in which he proposed phase sequences for the archaeology of the eastern and the western Navajo and evaluated hypotheses about Navajo migration into the Southwest, as well as ideas about subsequent Pueblo, Spanish, and Anglo-American influences on Navajo culture.

Eddy published a two-volume synthesis of the Navajo Reservoir results in 1966, but revisited the topic in 1972 with an analysis from an explicitly cultural ecological standpoint (Eddy 1972). He provides a cultural ecological sketch for each phase of four cultural traditions: Desert Culture, Pueblo (including Basketmaker), Navajo, and Spanish-American. For the Pueblo tradition, he used both survey and settlement pattern data to estimate population size and distribution in the reservoir district through time, and relied on functional analyses of artifacts, features, architecture, and community patterns to assess cultural stability, elaboration, or reduction from phase to phase. Turning to the paleoenvironmental record, he was able to show relationships between environmental stability or disruption, on the one hand, and changes in population size, distribution, and cultural elaboration, on the other.

Fieldwork for the Wetherill Mesa project was initiated in MVNP in 1958 and continued through 1963; analysis and report writing extended into 1965 (Osborne 1965:vii). The project was designed to excavate sites that could become educational exhibits on Wetherill Mesa, which was to be developed to ease visitor pressure on the existing sites and facilities on Chapin Mesa. Other goals were to obtain information that would improve the interpretive program of the park, and to

contribute new research knowledge to scholars and the general public through publication (Osborne 1965:vii). The work was explicitly designed to be interdisciplinary, and to bring results from various scientific fields to bear on the interpretation of Mesa Verde prehistory. Papers by collaborating natural scientists, a linguist, and a cultural anthropologist appeared in a Society for American Archaeology (SAA) memoir assembled by Osborne (1965). One of the project's monographic publications is devoted to the contemporary environment and ecology of the Mesa Verde (Erdman et al. 1969). Two brief monographs deal with physical anthropology (Bennett 1975; Miles 1975). The remaining five monographs deal with the Wetherill Mesa survey (Hayes 1964) and excavations at Big Juniper House (Swannack 1969), Mug House (Rohn 1971), Badger House (Hayes and Lancaster 1975), and Long House (Cattanach 1980).

In his report on the survey of Wetherill Mesa, Hayes (1964) provides a chronological framework for the project by reviewing and revising both the Mesa Verde phase sequence and the pottery typology. His analysis of the Wetherill Mesa survey data represents a coming-of-age for survey as a valuable information-gathering technique in its own right, complementary rather than secondary to excavation. Hayes succinctly and quantitatively documents shifts in settlement pattern and site size through time, and makes population estimates based on stated assumptions.

Rohn's (1965) brief paper on socioeconomic groups at Mug House was published in the volume assembled by Osborne. Unlike the more widely heralded papers on prehistoric Pueblo social organization by Longacre (1964) and Hill (1966), Rohn's paper focuses on groupings defined by residential propinquity and mode of interaction, rather than by more empirically remote kinship or residence rules (see Allen and Richardson 1971 for a critique of the latter approach). At Mug House, Rohn (1965:65) recognized three levels of grouping: household units, courtyard units, and village-sized communities. He also notes a possible additional grouping—the division of the Mug House community into two parts. This analysis was based on the repeated "juxtaposition of rooms with different functions, building sequences, patterns of movement indicated by doorway locations, and the placement of hearths and other domestic features" (Rohn 1965:65). The evidence for this analysis appears in more detail in the full report on Mug House (Rohn 1971).

The two Wetherill Mesa site reports devoted to excavations of Pueblo III cliff dwellings (Rohn 1971; Cattanach 1980) place the archaeology of this classic Mesa Verde site type on a much more solid footing than had the sketchy and impressionistic reports of Fewkes or the pioneering attempts of Nordenskiold . Big Juniper House is a multicomponent mesa-top site dating primarily to the late 1000s through mid-1100s (Swannack 1969). The Badger House report describes extensive excavations at a mesa-top settlement that was occupied more or less continuously from the late A.D. 600s through the 1000s, and then briefly in the 1200s (Hayes and Lancaster 1975). All these reports have excellent maps and photographs, making them quite useful for comparative studies. Artifacts are well described and illustrated, especially the pottery. The Mug House and Badger House reports provide particularly useful discussions of variation and chronology of pottery and some other artifacts.

In addition to working on the Wetherill Mesa project, Rohn conducted an analysis of existing survey and excavation data from Chapin Mesa, using this as the basis for his dissertation (Rohn 1966). One of the products of this research was a paper on water and soil catchment features on Chapin Mesa (Rohn 1963), including check dam systems and reservoirs. These had long been known (e.g., Stewart and Donnelly 1943) but Rohn documented the frequency with which they occurred and related them to the expansion of Pueblo II and III period settlements on the mesa. In 1972, Rohn amplified this analysis somewhat and suggested that the development of

community-level practices for constructing and managing water-control sytems may have been instrumental in the development of large aggregated villages in the Pueblo III period (Rohn 1972).

Publication of Rohn's (1966) dissertation *Cultural Change and Continuity on Chapin Mesa* unfortunately was delayed until 1977, but it remains a useful source. In it, he provides a systematic typology of sites, as perceived from surface survey, as well as a detailed analysis of architectural and artifactual continuity and variation through time. The last two chapters are the most innovative, especially in the context of the mid-1960s; here he uses settlement pattern data to identify residential site clusters, many of which he believes represent village-sized communities. Following Murdock (1949), he defines a community as a local group whose members come into face-to-face contact almost daily (Rohn 1977:277). Thus, even the relatively dispersed unit pueblos of the Pueblo II period could often be assigned to a community cluster; villages were just more dispersed at that time than during Pueblo III (Rohn 1977:295). He also notes that great kivas or functionally analogous ceremonial structures may have been a central focus for multiple, village-sized local groups, perhaps helping promote some mode of organization above the village level.

In the late 1960s and early 1970s, Rohn followed up on the ideas about community patterning that had been developed in his dissertation and in the Mug House studies by undertaking a program of "excavating complete prehistoric settlements (villages) at regular age intervals in the Yellow Jacket District of southwestern Colorado" (Rohn 1975:113). (The Yellow Jacket district is in the McElmo-Montezuma drainage unit northwest of the Mesa Verde.) The Ewing site was excavated in 1966, 1967, and 1968; the Gilliland site in 1971 and 1972, and the Payne site in 1974 (Nickens and Hull 1982:103-104). Although a few interesting papers have appeared as a result of this work (Rohn 1974, 1975; Hill 1985), full reports have not been published. Overall, Rohn's work represents a significant advance in the use of architectural and settlement pattern data to analyze prehistoric social organization.

The Department of Anthropology at CU was actively engaged in research at MVNP both before and after the Wetherill Mesa project. Publications based on CU field schools held in the park between 1953 and 1956 appeared during the 1960s (Lister 1964, 1965, 1966). After the close of the Wetherill Mesa project in 1965, its laboratory facilities became the base for CU's Mesa Verde Archaeological Research Center (MVARC), which conducted field schools and carried out small-scale excavations and extensive surveys in the park (and in some cases in other areas of southwestern Colorado as well) from 1965 through 1977 (Breternitz 1983). (Under the direction of David A. Breternitz, the research center moved its headquarters to Dove Creek, Colorado in 1977, and the name was changed to Mesa Verde Regional Research Center.)

A summary description of the park survey was published by Smith in 1987. Both Smith (1987:20-24) and Nickens and Hull (1982:87-101) list numerous survey and excavation projects carried out by the MVARC between 1965 and 1977 and their resulting publications and reports (also see Hull and Scott 1978). A number of these excavations were salvage projects associated with the development of visitor and service facilities in the park (e.g., Lister 1967; Lister, ed. 1968). Dissertations based on work CU in the park were produced by McLellan (1969) and Birkedal (1976).

Late in the 1957-1974 period, site survey increased in the study area as tribes and federal land-managing agencies began to respond to the mandates of the NHPA (and President Nixon's Executive Order 11593, issued in 1969) by initiating surveys to document the archaeological

properties they were charged with protecting and interpreting. For example, an extensive reconnaissance of BLM lands in the McElmo-Monument drainage unit was carried out by crews from the MVARC in the late 1960s (Martin et al. 1971). Surveys on lands of the Southern Ute Indian Tribe in the Upper San Juan-Piedra drainage unit became the basis for a settlement pattern analysis by E. Charles Adams (Adams 1973, 1974, 1975); in some cases, excavations were conducted as well (Lister et al. 1970). In the early 1970s, the MVARC also began conducting surveys, salvage excavations, and stabilization projects for the Ute Mountain Ute Tribe in the newly established Ute Mountain Ute Cultural Park, a large tract of land immediately south of MVNP. Salvage excavation was conducted at a number of sites along a new access road (e.g., Gillespie 1976; Hallisy 1974; McLellan and Hallisy 1970; Nordby 1973, 1974). Surveys, excavations, and stabilization were initiated in 1974 at cliff dwellings in the Johnson Canyon area of the tribal park (Nickens 1975, 1976a, 1976b, 1981).

In conclusion, the period 1957-1974 saw a remarkable increase in the amount of archaeology done in the study area, in the diversity of theoretical and methodological approaches employed, and in the extent to which archaeological research was structured by public, rather than purely academic, concerns. The emphases on cultural ecology, settlement pattern analysis, paleoenvironmental research, and the study of community social organization that became established in this period remain strong components of archaeological research in the study area today.

CULTURAL RESOURCE MANAGEMENT, PUBLIC INVOLVEMENT, AND PROCESSUAL THEORY: 1974-PRESENT

Citations to the literature will be made more selectively in this section of the historical review of archaeology in the study area than has been the case for previous sections. This is because of the large volume of reports and publications that has been generated, and because the substantive chapters make heavy use of these recent contributions.

As noted earlier, this period starts with the "Denver Conference" on CRM (Lipe and Lindsay 1974), which marked the emergence of a planning- and preservation-oriented approach to archaeology as federal and state agencies geared up to respond to the mandates of President Nixon's 1969 Executive Order 11593 and to the initial versions of the Advisory Council on Historic Preservation's regulations for agency compliance with Section 106 of the National Historic Preservation Act. Survey activity increased greatly after 1974, and a major data-recovery project—the Dolores Archaeological Program—was carried out from 1978 through the early 1990s. Many smaller testing and data recovery projects were conducted as well.

There were also changes in the institutional context for archaeology in the study area, including 1) the hiring of professional archaeologists by the major federal land-managing and project agencies; 2) the establishment of a number of private firms to provide CRM consulting services; 3) greater involvement in archaeological decision-making by Native American tribes; 4) the establishment of the Anasazi Heritage Center, the Crow Canyon Archaeological Center and the CU Cortez Center to facilitate public involvement in archaeology (and in the case of Crow Canyon, to conduct long-term field research in southwestern Colorado); and 5) the establishment of a long-term research program in the Lowry Ruin area, built around the Fort Lewis College field school.

The theoretical and methodological orientations of this period were largely an outgrowth of those of the previous period. Field and laboratory methods continued to become more sophisticated, and paleoenvironmental research progressed. Refinement of chronologies continued to be a basic concern. Most research in the study area continued to be guided by problems that became important during the "New Archaeology" movement of the 1960s and early 1970s; by the 1980s, this theoretical orientation was more commonly called "processual archaeology." These problems included understanding functional and evolutionary relationships among environment, population, settlement patterns, and community social organization. As processual archaeology has continued to evolve and expand (Willey and Sabloff 1993), sociopolitical, ideological, and symbolic variables have increasingly been given weight. Researchers have also begun to move away from an "integrated system" view of society to theoretical positions that in varying degrees incorporate notions of individual agency and of conflicts of interests between individuals, social segments and neighboring communities (see discussions in Chapter 1). Studies of cultural and non-cultural processes of site and assemblage formation have also become prominent during this period, as have various attempts to build computer models of the interaction of social, demographic, and environmental variables. These include recent "agent-based" models influenced by work in "complexity theory." The more extreme cultural relativist and anti-scientific positions espoused by "postprocessual" archaeologists have gained little or no standing in the study area. The appearance of postmodern perspectives in the general archaeological literature may have contributed to the move away from a "homeostatic system" view of society and from the notion that economic relations necessarily predetermine other aspects of society and culture. In general, American processual archaeology (or perhaps the "expanded processual" version of it [Willey and Sabloff 1993:305]) has overwhelmingly prevailed as the "normal science" of the period for archaeologists working in the Southwest, including the study area.

Interest in interregional cultural, social, and economic relationships has been promoted by the recognition in the 1970s of the scale of the "Chacoan System" in the northern Southwest, and of the number and far-flung distribution of "Chacoan outliers." Although the Chacoan relationships of sites such as Lowry Ruin and Chimney Rock Pueblo had been recognized in previous periods, additional Chaco-related sites were identified in the study area in the 1970s, and researchers working in southwestern Colorado have contributed both data and hypotheses to the panregional study of things Chacoan.

Credible new evidence of violence, from excavations in the study area and from other parts of the Southwest, helped revive interest in warfare as an important factor affecting settlement patterns, community organization, mobility, and migration. This period also saw the first clear-cut demonstration that the study area had been occupied during the Archaic stage and the first systematic documentation of probable early Ute sites. The bulk of research, however, continued to focus on the archaeology of the Basketmaker-Pueblo tradition, with emphasis on the Pueblo I and III periods.

Some of the major projects and accomplishments of this period in the study area are briefly described below.

Growth of the Survey Database

The great majority of the sites documented for the study area have been recorded since 1974. A review of site files at the CHS by Mary Sullivan and Richard Wilshusen in early 1998 showed that 13,423 archaeological sites, representing 19,420 components had been recorded

within the study area. In addition, the files contained records of 3,245 isolated finds. Even though large amounts of time and money have been spent on survey activities in recent years, only a small proportion of the study area has been surveyed to Class III (systematic intensive ground coverage) standard. The percentages of survey coverage by area for the several counties included partially or wholly in the study area are as follows: Archuleta 3 percent, Dolores 5 percent, La Plata 3 percent, and Montezuma 13 percent (Office of Archaeology and Historic Preservation [OHAP]1996:43). Overall, survey coverage in the study area compares favorably with the 4.1 percent coverage for the state as a whole (OAHP 1996:3).

The rapid growth of the statewide survey database since 1974 has resulted from development of a CRM infrastructure of agency archaeologists, State Historic Preservation Office (SHPO) staff, and consultants, as well as from a large increase in economic development activities on public lands in the study area. Numerous small- to large-scale surveys have been conducted in conjunction with oil and gas exploration and production, and with the development of extensive CO_2 production (e.g., Whitten et al. 1986; Fetterman and Honeycutt 1987). This work has been most extensive in the Monument-McElmo drainage unit.

Construction of the McPhee Dam and Reservoir by the Bureau of Reclamation as part of the Dolores Project occasioned inventory of the lands in and around the reservoir construction area in the Dolores drainage unit (e.g., Kane et al. 1986). Delivery of irrigation water from the Dolores Project also required surveys of the canals and lateral feeders that were to deliver water to existing farmlands, largely in the Montezuma-McElmo drainage unit (e.g., Kuckelman 1986; Fuller 1987). In addition, Dolores Project water has permitted new farms to be developed on Ute Mountain Ute tribal lands in the Ute drainage unit, and extensive surveys were conducted of these lands (e.g., Fuller 1988c, 1989a). The archaeologial work associated with mitigating the effects of construction of the dam and reservoir is referred to as the Dolores Archaeological Program (DAP). The later surveys and excavations required by the construction of the Dolores Project's extensive canals and feeder systems, and the development of the Ute Mountain Ute irrigated farmlands, are referred to as the Four Corners Archaeological Project (FCAP) (Hurley 1998).

In the area south of Durango in the Animas drainage unit, surveys and related studies were conducted for the proposed Animas-La Plata project, another BOR water project (e.g., Ware 1981; Winter et al. 1986; Fuller 1988b; Chenault, ed. 1996) As of this date, the Animas-La Plata project has not gone beyond the planning stage, full-scale data recovery has not been undertaken, and future of the project is in some question. Numerous other surveys have been conducted in response to construction of roads, pipelines, utility lines, and grazing facilities, among others.

Land-managing agencies have also initiated surveys under provisions of Section 110 of the NHPA, to obtain better information about the cultural resources they manage, so that planning, preservation, and public interpretation can be enhanced (e.g., Chandler et al. 1980; Gleichman and Gleichman 1989; Greubel 1991). In the Chimney Rock locality of the Upper San Juan-Piedra drainage unit, the USDA Forest Service sponsored surveys and excavations related to the development of Chimney Rock Pueblo as an interpretive site for visitors. The work was done in the early 1970s, but published later (Eddy 1977). Several doctoral dissertation projects in the Montezuma-McElmo drainage unit have also added to the survey database. Adler, working in cooperation with the Crow Canyon Archaeological Center, surveyed the area surrounding Sand Canyon and Goodman Point Pueblos (Adler 1990), and Neily (1983) surveyed several large tracts of land on the Colorado-Utah border. Kendrick (Kendrick and Judge 1996) is completing a dissertation based on intensive survey in the Lowry Ruin locality.

Dolores Archaeological Program

The Dolores Archaeological Program (DAP) was one of the largest archaeological mitigion projects ever carried out in the U.S. It was funded by the BOR and carried out by CU as the principal contractor and Washington State University (WSU) as a primary subcontractor (Breternitz 1993a). The work was done to mitigate the effects of the reservoir and dam construction for the Dolores Project. This part of the archaeological work associated with this large water development project took place in the years 1978 through 1985 (Robinson et al. 1986). As noted above, the other main part of the project dealt with mitigating the effects of constructing the water delivery system; this work has continued until recently. The following summary of the DAP is based on Lipe (1998).

The DAP resulted in testing or partly excavating 101 of the more than 1,600 sites within the reservoir take line. Of these, 41 sites received more than one crew week of fieldwork (Robinson et al. 1986). The DAP made a number of contributions, including 1) establishment of an excellent public museum at the Anasazi Heritage Center near Dolores, now visited by more than 40,000 people a year; 2) concurrent establishment at the Heritage Center of a well-run repository that makes collections and records from numerous federally related projects in the region available for continuing study; the museum and repository were built by the BOR and are operated by the BLM; 3) well-ordered collections, paper records, and a large computer database, accessible at the Heritage Center; 4) training of many young archaeologists who continue to work as professionals; 5) lessons in the effective organization of large-scale, multidisciplinary projects (Breternitz 1993a); 6) a number of substantive and methodological contributions to American archaeology.

This last point is an important one, because the underlying premise of the mitigation of adverse effects through "data recovery" is that information gained through study of the archaeological record can compensate in some ways for the loss of the physical record itself. The principal results of the project were published by the BOR in 13 weighty volumes containing detailed site reports, as well as a number of synthetic and topical studies (Blinman et al. 1988; Breternitz 1983, 1984; Breternitz et al. 1986; Gross and Kane 1988; Kane and Gross 1986; Kane et al. 1986; Kane and Robinson 1986, 1988; Kohler et al. 1986; Lipe, Morris, and Kohler 1988; Petersen et al. 1985; Petersen and Orcutt 1987). In addition, more than 200 other technical reports were produced and given much more limited circulation. A number of theses, dissertations, journal articles, and book chapters have also been based on DAP studies and data. Some of these were written by DAP personnel during or shortly after the project. There has also has been a continuing stream of more recent articles that follow up on the issues raised by the first round of publications, or that address new questions with data from DAP collections or the computer database.

The principal DAP results include the following:

- Improved Understanding of Puebloan Culture, A.D. 650-900

  The bulk of the archaeological record of the reservoir area resulted from intensive use of the area by Mesa Verde Puebloans between about A.D. 650 and 900. This period has consistently been interpreted by most Southwestern archaeologists in terms of a model of gradual, progressive change, in which agricultural dependence, settlement size, architectural permanence, and material culture elaboration all increased more or less in lock step. The DAP results told a quite different story (see Wilshusen, Chapter 7, this report) and thus helped loosen the grip of such implicit gradualist models on

Southwestern archaeology (see Berry 1982). The data demonstrated a cycle of rapid population growth and decline in the 800s, accompanied by aggregation into large villages, a number of changes in architecture and material culture, and evidence of subsistence and organizational change as well (Kane 1986a, 1989; Orcutt et al. 1990).

This demonstration of a population boom and bust cycle raised the obvious question of where the settlers came from and where they went. This helped stimulate the DAP researchers to take a much broader view geographically of settlement and population dynamics in the Four Corners area (see discussions in Wilshusen, Chapters 6 and 7, this report). More recent work also indicates that the movement of people out of the Dolores Valley in the late A.D. 800s was part of a larger pattern. The A.D. 900s appear to be a time of very low population in the northern San Juan or Mesa Verde region (Wilshusen and Schlanger 1993; Wilshusen and Wilson 1995; Wilshusen and Ortman 1999). Although this remains speculative, the area that seems most likely to have received these emigrants is the San Juan (geologic) basin of northwestern New Mexico, where they may have contributed to the emergence of the Chaco phenomenon.

- Reconstruction of Past Environmental Conditions

Ken Petersen and his co-workers in the DAP Environmental Archaeology group did a masterful job of developing a model of past climatic change based on tree-ring and palynological data (see Petersen 1988 and various papers in Petersen and Orcutt 1987). Petersen and colleagues reconstructed annual precipitation, summer precipitation, and summer warmth, as well as the effects of physiography on cold-air drainage and pooling. Taking into account elevation, exposure, and cold-air drainage, Petersen proposed episodic changes in the width of the "dry-farming belt" in southwestern Colorado from the late A.D. 500s through 1300 (Petersen 1987a). Data on frequency of drought and short summers also enabled measures of agricultural costs and stresses to be created (Orcutt 1986, 1987; Kohler et al. 1986).The model of environment and subsistence potential showed generally good agreement with the main contours of project area population and settlement (Schlanger 1986, 1988).

- Understanding Processes of Socio-cultural Change

The DAP provided the opportunity for an intensive, multidisciplinary investigation of prehistoric social and economic change over a relatively short time (by archaeological standards) in a small region (Breternitz et al. 1986). Studies showed that population increase in the A.D. 800s was associated with settlement aggregation, intensification of farming, anthropogenic impacts on the local environment, elaboration of religious ritual, and some degree of concentration of social power, though not of the sort that was clearly expressed by individual display of status markers (Kane 1986b, 1989; Lipe and Kane 1986; Orcutt et al. 1990; Blinman 1989).

This research provides one of the best-documented case studies of the interaction of demographic, social, and environmental variables in American archaeology (see Breternitz et al. 1986). It introduced a much-needed empirical case study into the raging early-1980s debate about whether prehistoric Pueblo societies were rigorously egalitarian tribes or represented more complex social formations having strong hierarchical institutions (e.g., Upham 1982; Plog and Upham 1983; Reid 1985). By conducting

well-designed studies of multiple lines of evidence, the DAP produced answers that were more complicated and interesting than either hypothesis had suggested. Since the mid-1980s, studies of Puebloan social and economic change have been less rhetorically strident and more empirically robust. The DAP example undoubtedly contributed to this trend.

DAP researchers also moved away from prevailing models of organizational change that explicitly or implicitly assumed that changes could be explained by processes operating largely in situ within relatively small regions (such as a river valley or mesa). Instead, an explicit attempt was made to relate changes in the project area to those occurring in the broader Four Corners area, and to consider interregional differences in social and economic "push" and "pull" factors that may have influenced population movement (Lipe 1986; Lipe and Kane 1986; Lipe, Kohler, et al. 1988).

- Development of Archaeological Methods

Several methodological contributions of the DAP stand out. One was the use of archaeobotanical samples to document changing patterns of firewood and construction timber use as population size and settlement aggregation increased (Kohler and Matthews 1988; Kohler 1992b). These studies supported the inference that in the A.D. 800s, the large population of the Dolores area had begun to impact the local environment by depleting certain wood resources, leading to a shift to less desirable species.

The DAP also fostered computer simulations as a tool for studying social and environmental relationships. Using survey data in conjunction with soil maps, physiography, and reconstructions of climate and agricultural yield, Kohler and others (Kohler et al. 1986; Orcutt et al. 1990) modeled population growth and settlement pattern change. In recent years, Kohler, Van West, and others have continued to develop increasingly sophisticated simulations, using archaeological and environmental data from a larger area of southwestern Colorado, predominantly in the McElmo-Monument drainage unit (Van West 1994b; Kohler and Van West 1996).

DAP researchers also did some pioneering work in "accumulations research," i.e., the rates at which various kinds of materials are deposited in the archaeological record to form assemblages. These proved helpful in "unmixing" multiple-component assemblages of pottery and in estimating length of settlement occupation, number of households, or standing inventories of vessels (Kohler and Blinman 1987; Blinman 1988a). Several "graduates" of the DAP, as well as others, have continued to use DAP data to carry forward similar research into accumulation rates and assemblage formation processes in recent years (e.g., Schlanger 1990, 1991; Varien and Mills 1997).

The DAP lab programs in artifact analysis (Blinman 1986a; Phagan 1986) made a number of contributions. In ceramics, these included improvements in pottery chronology (Blinman 1988b), functional interpretation of pottery vessels (Blinman 1988a), determining whether production was at the household or specialist level (Blinman and Wilson 1988), and interpreting evidence of interregional exchange of ceramics (Blinman and Wilson 1988). The lithic artifact analysis program developed methods for facilitating comparisons across large data sets and large numbers of archaeological contexts in terms of lithic raw materials, tool morpho-use categories, chronological period, and functional

site type (Phagan 1986). A multivariate analysis of projectile point form permitted comparison of statistically derived and intuitive point typologies (Phagan 1988a and 1988b).

- Data Comparability and Quality Control

The DAP was able to tackle large-scale problems in processual archaeology and to develop or test important new methods because a serious commitment was made to obtaining comparable, high-quality data. This was not an easy problem, because up to 10 excavation crews were in the field at the same time, and the central analytical laboratory operated for a number of years, with several changes in key personnel.

Although most DAP excavations were designed to sample particular kinds of structures, features, or contexts, a sample of sites was also subjected to probabilistic sampling by standard-sized pits (Kohler and Gross 1984). The "probability sample" made possible systematic comparison of quantities and rates of deposition of various kinds of material from across the project. These data were critical in a number of project-wide, problem-oriented studies.

The DAP staff invested great effort in developing field forms that required certain kinds of data to be recorded in a certain way, while not precluding additional narrative comments. This resulted in the generation of an enormous amount of detailed and reasonably comparable data on features, architecture, artifacts, and depositional contexts, from both the judgmentally chosen as well as the probabilistically selected excavation units. In addition, the lab analytical systems were designed to produce comparable data within each main class of artifacts. A strong commitment to data quality also resulted in the development of systems for verifying both field and lab data.

Finally, much effort was expended to develop a comprehensive computer database, despite the relative primitiveness of the computer hardware and software available in the early 1980s. This database continues to be accessible at the AHC and in several copies located at other institutions, and has been used in a number of studies done since the DAP ended (e.g., Schlanger 1991; Kohler 1992a; Hegmon 1995; Potter 1997). Fortunately, a recent CHS grant to the AHC has resulted in a much-needed upgrading of the documentation, and conversion to a much more user-friendly format, so that it can continue to support new research in the future (Wilshusen 1999).

Four Corners Archaeological Program

The construction of McPhee Reservoir was of course only one part of the CRM response to the construction of the Dolores Project, which also required canals, lateral feeder lines, access roads, etc. Starting in 1983, the BOR has contracted for surveys, testing, and data recovery efforts related to construction of the water-delivery facilities. The BOR funded this work through an on-call contract referred to as the Four Corners Archaeological Program (FCAP). Most of the lands that received new Dolores project water were private lands and had already been in agricultural production, so testing and data recovery work was focused on the federally-funded construction of canals and other features. On the Ute Mountain Ute Reservation, however, extensive new lands were being put into production, so data recovery efforts were employed at a number of sites that were to be impacted by land clearing and leveling, as well as by the

construction of water-delivery features. The major activities of the extensive FCAP include the following (Hurley 1998):

1) From 1983-1992, excavations were conducted at a number of sites along the Dove Creek, South, and Towaoc Canals, and Hovenweep, Rocky Ford, Towaoc, Farview, and Ruin Canyon laterals. This work was done by Complete Archaeological Service Associates (CASA), under the overall direction of Laurens and Nancy Hammack.

2) Four sites on the Dolores Plateau were excavated In 1984 by Woods Canyon Archaeological Consultants, Inc., under the direction of Jerry Fetterman and Linda Honeycutt.

3) Under the direction of Mark Chenault, SWCA, Inc. conducted excavations from 1993 to 1996 at several sites along the Lone Pine Canal, and the Hermana and Towaoc laterals.

4) From 1993-1997, excavations were conducted at 63 sites as part of the Ute Mountain Ute Irrigated Lands Archaeological Project (UMUILAP). The work was done by Soil Systems, Inc. (SSI), under the direction of Cory Breternitz.

Many of the reports for the last two subprojects are still in preparation or in draft form, and the earlier reports have not yet been published by the BOR. Because of the very high costs of the DAP mitigative work, the 4 percent cap for archaeological mitigation on the Dolores Project as a whole was exceeded (Hurley 1998). This has made it more difficult for the BOR to fund a timely publication program for the FCAP. It appears, however, that the major reports produced by CASA will be published soon (Hurley 1998).

Funding limitations, the length of time over which FCAP has played out, and the discontinuous and often linear nature of the areas covered by the FCAP mitigative effort also precluded the development of an integrated system of analytical and comparative studies such as the one developed by the RDAP. As a result, the focus of FCAP has been to produce descriptive reports with analytical and contextual studies keyed to specific reports or projects. Because it covered a large but spatially compact area, the UMUILAP most resembles the DAP in supporting controlled intersite comparisons. Many of the descriptive reports that have been completed by FCAP so far are exceptionally well-done and informative, and those still in draft stage also show promise of being major contributions to an improved understanding of the archaeology of southwest Colorado and the broader Four Corners region.

Some of the major FCAP excavation reports include Billman (ed. 1997, ed. 1998); Chenault (1998a, 1998b); Curtis (1992); Errickson (1993, 1995); Hammack (1992a); Kuckelman and Morris (1988); McNamee and Hammack (1992); and Morris (1986a, 1986b, 1991).

Warren Hurley, the BOR archaeologist responsible for managing the FCAP effort, has briefly listed some of the contributions of this program (Hurley 1998):

- Evidence of the sudden abandonment of a small multisettlement community in the Ute Mountain Irrigated Lands area at about A.D. 1150, with evidence of violence and perhaps cannibalism; pottery at these settlements showed affiliations with the Chuskan area to the south. Hurley (1998) suggests that severe drought and/or the social and ideological

aftermath of the collapse of Chacoan centers may be implicated in the destruction of this community.

- Demonstration of a pattern of stockade construction around the larger Basketmaker III sites in the Yellow Jacket area in the McElmo-Monument drainage unit. (Wilshusen has further comments on this topic in Chapter 6.)

- Excavation of a Late Archaic or early Basketmaker II period pitstructure in the Ute drainage unit and demonstration of a significant Archaic presence in the area.

- Investigation of the historic period archaeology of the Ute Mountain Ute Indian Reservation.

- Documentation of a well-preserved kiva mural at the Knobby Knee site in the McElmo-Monument drainage unit.

- Advances in standardizing the use of mechanical stripping of sites as an initial investigative method, and in the use of subfloor core sampling.

To Hurley's listing of specific contributions, the author adds that Huckleberry and Billman (1998) convincingly show that locality-wide patterns of occupation and abandonment of the southern Ute Mountain piedmont cannot be explained by patterns of alluvial aggradation and entrenchment in the ephemeral watercourses of this area. Flood water and *akchin* farming in the area appears to have been well adjusted to frequent shifts in the loci of deposition and erosion in the stream systems. It also is clear that considered together, the FCAP projects have yielded a wealth of well-dated assemblages of architectural features, artifacts, and ecofacts from a large range of site types and from several periods, including the Archaic. They also have given us new insights into settlement patterns and histories of occupation in several localities in the McElmo-Monument and Ute drainage units. The descriptive reports that have been produced are generally thorough and well illustrated and document the intra-site distributions of artifacts and features in a systematic way; they are quite useful as reference works. Information from the various FCAP projects is only now becoming known as new reports are completed and the older reports begin to receive at least limited circulation.

Crow Canyon Archaeological Center

In the late 1960s, Edward Berger, a teacher in the Cherry Creek School District near Denver, began to conduct a variety of educational programs in southwestern Colorado that were designed for high school students and that emphasized participatory learning. In the early 1970s, Berger established the Interdisciplinary-Supplemental Education Program (I-SEP) as a not-for-profit organization through which to administer educational programs in the Southwest; he also moved to the Cortez area and in 1975 established the Crow Canyon School so that these programs could be expanded (Berger 1993). From the late 1960s through the 1970s, Berger maintained some programs that involved student participation in research projects that were being conducted by professional archaeologists, including Art Rohn of Wichita State University, and Ron Gould, a graduate student at the University of Texas (Berger 1993). In the winter of 1981-82, the facilities of the Crow Canyon School and 70 acres of surrounding land were sold by Berger and his wife Joanne to the Center for American Archaeology (CAA) of Kampsville, Illinois, a not-for-profit archaeological research and educational institution that had been established by

Professor Stuart Struever of Northwestern University. The Cortez facility became the Southwestern campus of the CAA, and as such undertook its first research and educational programs in 1983. Early in 1985, it became an independent, Colorado-based organization with Struever as its first president; the name was then changed to Crow Canyon Archaeological Center.

Over the years, the Crow Canyon Archaeological Center has become an active contributor to both archaeological education and research. It currently offers a number of educational programs for students from fourth grade through high school seniors, including a 4-week high school field school. Adults can enroll in research participation programs, and in Cultural Explorations, which are usually one-week seminars focused on some topic in archaeology or Native American culture. Native American scholars and artists lead a number of the Cultural Exploration programs. In 1995, the Center established a Native American Advisory Committee to facilitate input from and dialog with Native American communities regarding both research and education. Crow Canyon's field research has focused on four main projects: the Duckfoot site, the Sand Canyon project, the Pueblo III "Big Site" project, and the current Communities Through Time project.

Duckfoot Site

The Duckfoot site is a Pueblo I hamlet located near the Crow Canyon campus. It was excavated between 1983 and 1987 by participants in Crow Canyon's educational programs, primarily under the direction of Ricky Lightfoot. E. Charles Adams and Bruce Bradley were responsible for the 1983 season, and Bradley codirected fieldwork with Lightfoot in 1984 (Lightfoot and Etzkorn 1993:xiii). The project was developed to test some of the models of Pueblo I period household and community organization and sociocultural change that had been developed by workers on the DAP. Several publications based on the Duckfoot research have appeared (e.g., Lightfoot 1992, 1993, 1994; Lightfoot and Etzkorn 1993; Hegmon 1995; Varien and Lightfoot 1989). Wilshusen (Chapter 7, this report) has synthesized the principal substantive contributions of the Duckfoot research.

Numerous tree-ring dates showed that Duckfoot was occupied for only a generation or so—from the late A.D. 850s to about 880. The site was almost completely excavated, and there were large artifact assemblages on the floors of most structures. These characteristics have made it useful for a variety of site and assemblage formation studies (see Lightfoot 1994). In particular, the floor and midden assemblages from Duckfoot have been useful in testing and calibrating various models of vessel breakage, discard, and rate of accumulation (Varien and Potter 1997; Varien and Mills 1997). Varien and Potter (1997) make the point that extremely well understood archaeological examples such as Duckfoot can serve as "strong archaeological cases" that can provide interpretive analogs that are in many cases superior or at least complementary to those derived from ethnoarchaeological examples.

Sand Canyon Project

While the excavations at the Duckfoot site were being conducted, researchers at the Crow Canyon Center were also planning a multistage research project focused on the Sand Canyon locality, a study area of approximately 200 km^2 located west of Cortez in the Monument-McElmo drainage unit (Lipe and Bradley 1986, 1988; Lipe 1992a). The study area lies between Yellow Jacket Canyon on the north and McElmo Canyon on the south. Research was designed to concentrate on the Pueblo III period (A.D. 1150-1300). Fieldwork was initially focused on

excavations at Sand Canyon Pueblo, a large Pueblo III village, and then was expanded to include survey and testing at other sites (Lipe 1992a). In 1983 and 1984, field research on the Sand Canyon project was secondary to the work at Duckfoot, but became the primary focus of Crow Canyon's fieldwork from 1985 through 1993. The project was organized to investigate several research domains: 1) Pueblo III community organization; 2) demographic, social, and cultural change during the period, including the depopulation of the locality in the late A.D. 1200s; and 3) whether Pueblo III communities in the locality were sociopolitically "complex" relative to prehistoric and historic Pueblo communities (Lipe 1992a:3-5). The research program also included "instrumental studies" such as chronology-building, reconstructing past environments, and understanding site and assemblage formation (Lipe 1992a:5).

The Sand Canyon project field research had three components. First, Adler, Van West, and others conducted intensive surveys of approximately 26 km^2 around Sand Canyon Pueblo and Goodman Point Ruin (Adler 1990; also see references in Adler 1992). Second, Mark Varien directed a testing program at 10 small sites located near Sand Canyon Pueblo; at Castle Rock Pueblo, a medium-sized site located approximately 7.5 km south of Sand Canyon Pueblo, and at two small sites located near Castle Rock Pueblo (Varien et al. 1992; Varien, ed. 1999). Third, intensive excavations were carried out at portions of Sand Canyon Pueblo by Bruce Bradley (Bradley 1992, 1993a), at Castle Rock Pueblo by Lightfoot and Kuckelman (e.g., Lightfoot and Kuckelman 1993, 1994), and at a small habitation site, Green Lizard, by Edgar Huber (Huber and Lipe 1992; Huber 1993). A progress report on the Sand Canyon project was published in 1992 (Lipe ed. 1992), and a book on the results of the project is in preparation.

Varien's (ed. 1999) final report on the Sand Canyon Project Testing Program is available at the Crow Canyon web site (http://www.crowcanyon.org) and also in a compact disk version. Extensive descriptive reports on the excavations at Sand Canyon Pueblo and Castle Rock Pueblo are being prepared, and will also be distributed through Crow Canyon's web site. The decision to make detailed archaeological context reports available in this format was made due to the enormous requirements of time and money required to produce such reports in book form, and to the limited demand for the purchase of such reports once they have been published. Researchers at the Crow Canyon Center believe that the ability of contemporary archaeology to produce data has outstripped the ability of traditional modes of publishing to disseminate it. Publication on the Internet promises to greatly reduce time and costs while making reports much more accessible to researchers as reference works and as sources of comparative data.

In addition to the publications listed above, Sand Canyon project data have contributed substantially to several theses, dissertations, journal articles, reports and book chapters (e.g., K.R. Adams and Bowrer 1998; Adler 1994, 1996a, 1996b; Adler and Varien 1994; Bradley 1989, 1996; Bullock 1992; Driver 1996a; Glowacki 1995; Glowacki et al. 1995, 1998; Hovezak 1992; Kenzle 1993, 1997; Kilby 1998; Mills 1987, 1993; Munro 1994; Nicklaw 1995; Thompson et al. 1997; Van West 1990, 1994a, 1994b, 1996a).

PIII "Big Site" Project

In 1990, the Crow Canyon Center, with funding from the Wenner-Gren Foundation, hosted a conference on "Pueblo Cultures in Transition: A.D. 1150-1350 in the American Southwest." The conference brought together archaeologists from throughout the Pueblo Southwest, who synthesized information on population dynamics, community and settlement pattern change, and sociocultural change for 12 regions of the Pueblo Southwest during the period

in question. Because in most areas this was a time of settlement aggregation, the participants attempted to list and make location maps of sites greater than 50 rooms in size, on the assumption that most such sites were known and that they represented village-based communities or central sites for more dispersed communities. Hence, it was expected that for most of the regions being considered, a distribution map of the large sites would be a fair proxy for the distribution of communities. The papers from the conference were eventually published (Adler, ed. 1996).

Varien et al. (1996) identified 96 large Pueblo sites dating from A.D. 1100 to 1300 in southwestern Colorado and adjacent areas of southeastern Utah as far west as the Montezuma Creek drainage. The utility of using this database for further studies of population and settlement pattern change in the northern San Juan drainage seemed apparent. It also seemed evident that the model of community aggregation and organizational change that had been developed by the Sand Canyon project needed to be tested by additional investigations at large site complexes outside the Sand Canyon locality (e.g., Lipe and Bradley 1986, 1988; Lipe 1992b; Adler 1994; Adler and Varien 1994; Varien et al. 1996). This reflected the growing recognition that substantial demographic and organizational changes took place throughout the northern San Juan region during the Pueblo III period and that these cannot be understood only on the basis of work in one or a few localities.

Consequently, from 1994 through 1997, teams from the Crow Canyon Center undertook limited testing at sites outside the Sand Canyon locality: Woods Canyon Pueblo and the Yellow Jacket site in the Yellow Jacket drainage north of the Sand Canyon locality, and at the Hedley Ruin complex in the Monument Canyon drainage on the Utah-Colorado border. All three sites are in the McElmo-Monument drainage unit. The report by Wilshusen et al. (1997) on testing of a prehistoric reservoir near Woods Canyon Pueblo has been published, and Kuckelman's (1997) brief summary of the testing program at Yellow Jacket Pueblo is available on Crow Canyon's web site (http://www.crowcanyon.org). Brief annual reports of work at Yellow Jacket, Woods Canyon, and Hedley have been prepared but not widely circulated. Detailed reports on the test excavations at all three sites are in preparation and will be posted on Crow Canyon's web site. The substantive results of this work have shown that the settlement model developed for the Sand Canyon locality is supported in general, but with more overlap in the timing of the successive settlement and community patterns than had been proposed. These results are discussed in more detail in Chapter 9.

Crow Canyon researchers also have continued to extend and upgrade the "big site" database, including visits to many of the sites to assess and upgrade old survey data. In 1994 and 1995, a grant from the CHS funded the establishment of ground controls by Lipe and Scott Ortman at 27 of the large PIII sites in southwestern Colorado plus the Hedley complex on the Utah-Colorado border. Rocky Mountain Aerial Survey of Englewood, Colorado, was contracted to photograph these sites from the air. Using the resulting stereo pairs of aerial images, Carrera and Associates of Englewood used photogrammetric methods to make detailed topographic maps of 12 of the sites. Lipe submitted NRHP nominations to the CHS for 6 of the 12 sites; these 6 sites are now on the National Register (Lipe 1996b; 1999a, 1999b, 1999c, 1999d, 1999e).

Varien (1997, 1999b) recently employed data from the small site testing component of the Sand Canyon project and the Big Site project to synthesize evidence regarding mobility and settlement patterns for the northern San Juan at levels of social grouping ranging from the household through the face-to-face community to the regional population of communities.

Communities Through Time: Migration, Cooperation, and Conflict

In 1996, archaeologists at the Crow Canyon Center developed a new research design that focused on examining the development and abandonment of Puebloan communities in the Mesa Verde region between A.D. 900 and 1300 (Ward 1997). This reflected an interest in studying the predecessors of the Pueblo III communities that had been the object of the Sand Canyon project and the PIII Big Sites project. It also recognized that both cooperation and conflict were important social processes both within and between communities in the region. The emphasis on migration was in response to the growing recognition that much of the Mesa Verde region had undergone a population decline in the A.D. 900s, and that at least some of the evident population increase in the late Pueblo II and Pueblo III periods may have been the result of immigration. At the other end of the sequence, it was recognized that migrations out of the Mesa Verde area may have resulted in linkages with Pueblo communities in the Rio Grande and possibly, the Western Pueblo areas.

To pursue these research interests, fieldwork was initiated in 1996 at Shields Pueblo, a spatially very extensive multicomponent site located in the Sand Canyon locality just north of the Goodman Point site. It was hoped that excavations at Shields could provide information on the formation and duration of the Goodman Point community, and it was hypothesized that the center of this community was at the Shields site until the late Pueblo III period, when it moved to the Goodman Point site, which is built around a large spring at the head of Goodman Canyon. Shields Pueblo was mapped in 1996; excavations began in 1997 and will continue through the 2001 field season (Duff and Ryan 1999; Ward 1997). Over the years, Shields Pueblo has been subjected to extensive disturbances due to pothunting and to farming. Remote sensing (magnetometer and resistivity survey) was used to identify kivas and other subsurface architectural elements that had remained intact; systematic surface collections were used to identify the main areas in which artifacts and building rubble were concentrated. Limited areas to be excavated were selected on the basis of this information. The remote sensing has been proved remarkably accurate in locating architectural remains and in mapping the overall layout of the site. Evidence of intensive occupation in the late Pueblo II and Pueblo III periods has been documented, as well as evidence of less intensive use of the site in the Basketmaker III and Pueblo I periods (Duff and Ryan 1999). Shields does not appear to have been abandoned in late Pueblo III times, as had been expected; instead, it apparently continued to have a significant residential population until the late A.D. 1200s (Andrew Duff, personal communication, 1999). If Shields, the nearby Goodman Point site, and Sand Canyon Pueblo (ca. 5 km to the west-southwest) were all occupied in late Pueblo III times, it indicates that the population of the central Sand Canyon locality was even larger than had been thought in the few decades before the abandonment of the area in the late A.D. 1200s.

Overall, the research program of the Crow Canyon Center has been successful in promoting a shift from the site to the community pattern as the primary unit for field investigation, and in recognizing different organizational and change processes at the household, community, and regional levels. Violence, probably the result of intercommunity warfare, has been identified as a likely factor in settlement pattern change and the abandonment of particular sites in the A.D. 1200s and probably in the 800s. Although some evidence has emerged of unequal access to economic and political power at both the intra- and intercommunity levels, claims that early Pueblo societies were strongly hierarchical have not been supported. Crow Canyon and Dolores project researchers have identified large-scale changes in size and distribution of population in the study area, raising questions about factors contributing these changes and the role of interregional emigration and immigration. Contributions have been made to paleoenvironmental reconstruction, and to understanding the socioeconomics of resource use in the area. There have also been

contributions to archaeological chronology and to the analysis of site formation processes, especially in the areas of "accumulations research" and processes of abandonment of structures and sites. In particular, the Crow Canyon research has shown that despite 125 years of research on the Pueblo III period, much can still be learned through the application of new methods and the asking of new questions.

Other Projects

Van West's work, much of it done in collaboration with the Crow Canyon Center, has contributed better understandings of the agricultural "carrying capacity" of the study area. Using soils data, tree-ring records and GIS to manipulate the data, she modeled both temporal and spatial variation in soil moisture, agricultural productivity, and potential population size for an approximately 1800 km^2 area of southwestern Colorado, including portions of the McElmo-Monument, Mesa Verde-Mancos, Dolores, and Ute drainage units (Van West 1990, 1994a, 1994b, 1996a; Van West and Lipe 1992). She also examined the relationship between population size and agricultural productivity in two localities having adequate archaeological survey data—Sand Canyon and Mockingbird Mesa. Van West concluded that the "great drought" and other periods of low precipitation would not have led to disastrous shortfalls in corn harvests if the study area was considered as a whole, but that some communities may have exceeded their carrying capacities if they were dependent on local catchments and distressed households were unable to move to more favorable locations.

Kohler and Van West (1996) have utilized Van West's data in a simulation of settlement response to spatial and temporal variation in agricultural productivity and risk in southwestern Colorado. This work is being done in conjunction with the Santa Fe Institute, which has provided pioneering support for development of the "science of complexity." Unlike earlier simulations, which modeled the behavior of social systems, Kohler and Van West's simulation is "agent-based." Households are the agents, which operate through time on the modeled resource landscape under certain social and adaptive rules. The goal is to determine which rules and constraints will succeed in reproducing the archaeologically observed settlement pattern changes in the modeled environment, including the shift from dispersed to aggregated community patterns. Kohler and Van West's study is part of a long-term effort by Kohler and other archaeologists to use archaeological data in the study of complex human and related environmental systems (see Kohler 1993:302-307).

Also working in collaboration with the Crow Canyon Center, Force and Howell (1997) have recently reported on interactions between the depositional history of a portion of the McElmo Canyon and Basketmaker–Pueblo farming in this area. They suggest that "an intricate feedback system apparently operated between sedimentary and geomorphic events on one hand, and Anasazi agriculture and habitation on the other" (Force and Howell 1997:vii). They do not see flood plain entrenchment as a major factor in regional abandonments, although it may have affected particular settlements and perhaps localities.

Eddy's (1977) monograph on survey and excavations in the Chimney Rock area was a pioneering effort to understand the social and adaptive processes involved in the establishment and maintenance of a Chacoan outlier in an existing late Pueblo II community in the Upper San Juan drainage unit. Chimney Rock Pueblo had been excavated in the early 1920s by Jeancon and Roberts (1923). In the early 1970s, Eddy supervised field crews from CU which cleared and stabilized the site, and conducted limited additional excavations. Intensive survey was carried out

in the vicinity of Chimney Rock Mesa, and a great kiva and several residential structures were excavated in the densely-settled community that surrounded the great house. As described in Chapter 8, the residential architecture contrasts strongly with that of the great house, with late Pueblo II architecture elsewhere in the study area, and with earlier Pueblo II sites in the Piedra drainage. Breternitz (1993) suggests that the habitation structures in the late Pueblo II Chimney Rock cluster indicate relationships with the Gallina area of northern New Mexico . Eddy (1993) and Mobley-Tanaka (1990, 1993) have carried out additional research in the Chimney Rock locality in recent years.

Another Chacoan great house, Escalante Ruin in the Dolores drainage unit, was excavated by crews from CU as a state bicentennial project (Reed et al. 1979). Portions of the Escalante Ruin and the small nearby Dominguez Ruin have been stabilized and are on display in conjunction with the nearby Anasazi Heritage Center. Survey in the vicinity indicates that Escalante Ruin is surrounded by a dispersed community pattern of small habitations (Kane 1993; Thompson 1994). Kane (1993) suggests that the Escalante community may have been involved in procuring timber and large animal products for larger Chacoan centers farther south.

Bruce Bradley has excavated portions of a relatively large Chacoan-style great house near Cortez, in the Monument-McElmo drainage unit (Bradley 1974, 1988). He suggests that the Colorado great houses may represent in part a "mission system" developed to establish Chaco-based religious practices among outlying populations (Bradley 1993b, 1984). Presumably, religious ties could in turn serve as the framework for social and economic interactions between the Chaco centers and the outliers.

A computer simulation of Pueblo site settlement and abandonment was carried out by Linda Cordell (1975, 1981). A model was constructed that assessed the farming potential of various physiographic and hydrographic situations on Wetherill Mesa under climatic conditions ranging from cool and wet to hot and dry. The Mesa Verde tree-ring record was then used as a proxy for climate to predict when particular locations would be occupied or abandoned, based on their combinations of environmental variables. The model was successful in predicting the distribution of sites recorded by the Wetherill Mesa survey (Hayes 1964) from approximately A.D. 700 to 1300. This study was a pioneering contribution to computer simulation, not just for the study area, but for American archaeology in general.

From 1974 through 1977, Joseph Winter directed a large-scale survey and limited site testing program on Cajon Mesa in and near the units of Hovenweep National Monument on the Utah-Colorado border (Winter 1975, 1976, 1977, 1978, 1981, 1984; Hammett and Olsen 1984). The goals of the project were to document settlement patterns through time and to relate these to environmental factors and to degree of dependence on farming. The survey was based on a quadrant sampling design and there was a heavy emphasis on collection of environmental data.

Between 1972 and 1975, CU carried out investigations in and around Johnson Canyon south of MVNP, in conjunction with development of visitor access to the Ute Mountain Ute Tribal Park. A portion of Johnson Canyon and the adjacent mesa top were surveyed. Excavations were focused on two small cliff dwellings and dendrochronological sampling was carried out in these and five other sheltered Pueblo III sites (Nickens 1981; Harrill and Breternitz 1976). Sites recorded and excavated in the early twentieth century by Earl Morris (1919b) were included in the study. Two episodes of beam cutting were identified; one concentrated in the A.D. 1130s through mid-1150s, and another from the late 1190s through 1215-1220. Archaeological data from the

project were interpreted in terms of a cultural ecological analysis and systemic model of adaptive response to varying environmental stresses—in this case, migration as a response to droughts in the mid-1100s and in the period A.D. 1218-1237 (Nickens 1981).

For a number of years, CU conducted archaeological field schools at several sites near Yellow Jacket in the McElmo-Monument drainage unit (Brown 1975; Cater 1989; Cater and Chenault 1988; Lange et al. 1986; Wheat 1955a, 1984; Mobley-Tanaka 1997a, 1997b). Field schools were conducted for several years in the Durango area (Animas Drainage Unit) and on Mockingbird Mesa (McElmo-Montezuma drainage unit) by John Ives of Fort Lewis College, but detailed reports of this work were not forthcoming. Duke (1985) summarizes some of Ives' work in the Durango area, based on existing field notes, and also reports the results of a field school that he (Duke) directed.

In 1983, Susan Kent excavated Gnatsville, a small Pueblo II period site in the Goodman Point area of the McElmo-Monument drainage unit (Kent 1986, 1991). Using a model of archaeological indicators of anticipated and actual length of occupation developed from ethnoarchaeological data (Kent 1992), she compared Gnatsville with the nearby Mustoe site (Gould 1982), with the Pueblo II component of Badger House on Wetherill Mesa (Hayes and Lancaster 1975), and with two small Pueblo II sites from the Dolores project area, Pinyon House (Kuckelman 1984) and Paintbrush House (Kleidon 1984). She concluded that three of the five had anticipated and actual year-round occupations, and that the two Dolores area sites were occupied only seasonally, although one had indicators of anticipated year-round use.

Archaeological work related to the development of CO_2 and petroleum resources in the McElmo-Monument drainage unit in the 1970s and 1980s not only occasioned a large number of surveys and a great increase in the survey database, but resulted in several data recovery projects as well. For example, Fuller (1984) reports on the identification and excavation of Pueblo III trench kilns that had been used in the firing of black-on-white pottery, sometimes in large quantities; this work was done in conjunction with the development of an oil and gas drilling pad by Celsius Energy Corporation and the development of CO_2 wells and facilities by Shell and Mobil Corporations. As part of the planning process for developing the well field with minimal impacts to archaeological resources, a predictive model was developed (Woodward-Clyde Consultants 1978; James et al. 1983). This model related geographic, geologic, and environmental data to the locations of known archaeological sites; it successfully predicted the occurrence and significance of archaeological resources in large grid cells imposed over the potential area of well field development. The construction of a CO_2 pipeline by Superior Oil Company resulted in the excavation of an early Pueblo II pithouse site, one of the few well-documented sites dating to the A.D. 900s in the drainage unit (Dykeman 1986). Whitten et al. (1986) report on testing a variety of site types dating to the Late Archaic/Basketmaker II, Basketmaker III, late PII, and PIII periods. The MAPCO Pipeline project, which passed through part of the study area, also resulted in testing and excavations at several sites (Fetterman and Honeycutt 1982), as did the construction of a transmission line by Empire Electric Association (Fetterman and Honeycutt 1984), and a compressor station by Northwest Pipeline Corporation (Fetterman and Honeycutt 1995).

In the Durango area, the relocation of a large tailings pile left from uranium processing occasioned survey, testing, and excavations in the Bodo Canyon area south of Durango, in the Animas drainage unit (Nickens and Chandler 1981; Fuller 1985,1988a). Just south of Bodo Canyon is Ridges Basin, the location of a water storage feature proposed for the Animas-La Plata reclamation project. Reference has already been made to archaeological surveys conducted in

conjunction with this project. Although the data recovery phase of the Animas-La Plata project has not been carried out, teams from Northern Arizona University (NAU) made detailed surface maps and systematically collected artifacts from 42 archaeological sites in Ridges Basin in 1992 and 1993 (Gregg et al. 1995:xii). The research design for the project has been published (Gregg and Smiley 1995a), and reports have also appeared on site characteristics (Gregg et al. 1995), the analysis of lithic and ceramic artifacts (Smiley, ed. 1995; Allison 1995), and various interpretive and synthetic studies (Gregg and Smiley 1995b). Together, the Bodo Canyon and the Ridges Basin projects have provided much new information about the occupation of the Animas drainage unit in the Late Archaic, Basketmaker II, Basketmaker III, and Pueblo I periods. A survey of traditional cultural properties (TCPs) has also been conducted in the area proposed to be affected by the construction of the Animas-La Plata project (NAU and SWCA Inc., Environmental Consultants 1996).

At MVNP, replacement of the water supply pipeline and related facilities in 1992-1997 occasioned survey, testing, and excavation of sites affected by this project. Forty-seven sites were discovered in the area of primary effect and 30 of these were excavated to some extent as a mitigative strategy (Ives et al. 1997:299). Archaeological components investigated on this project ranged from late Archaic, through the Basketmaker-Pueblo periods, to the Euro-American historic period (Ives et al.1997:299). One result of the project was documentation of several pottery-firing trench kilns dating to the early Pueblo II period, the earliest examples of this type of feature from the Mesa Verde region (Ives et al. 1997:299-300; also see Fuller [1984] and Purcell [1993] for information on kilns in the McElmo-Monument drainage unit).

The National Park Service is also supporting a long-term program of detailed mapping, architectural analysis, intensive tree-ring dating, and stabilization in cliff dwellings in MVNP. Mapping and architectural studies at Cliff Palace are discussed in a recent popular article in Smithsonian magazine (Roberts 1999), and technical reports are forthcoming (Linda Towle, personal communication, 1999). Fiero's (1998) draft report on Balcony House includes new maps and an interpretation of architectural features and building sequences, as well as a detailed account of the excavation and stabilization of the site by Jesse Nusbaum in 1910. The report also includes an appendix by Parks and Dean (1998) in which the chronological, architectural, and social implications of the tree-ring dates are discussed. In 1997, researchers from the Wright Paleohydrological Institute of Boulder, Colorado, cooperated with archaeologists at MVNP in reexcavation of a portion of a large reservoir in Morefield Canyon, originally excavated by crews from the University of Colorado in 1967 (Linda Towle, personal communication, 1999). The Wright Institute has also recently published Breternitz' report on the 1969 CU excavations at Mummy Lake, in the Far View site group (Breternitz 1999). Intensive surveys have recently been conducted in the Park to document the effects of recent wildfires on cultural resources; these have added numerous sites to the survey record for MVNP (Linda Towle, personal communication).

Hence, at the end of the millenium, we find new research going on at the sites that first drew attention to the archaeology of southwestern Colorado—the large Pueblo III masonry villages of the McElmo drainage that so impressed Jackson and Holmes in the 1870s, and the cliff dwellings of the Mesa Verde, including Cliff Palace—the site that rapidly came to symbolize Southwestern archaeology after Richard Wetherill's first viewing of it in 1888. This is a good measure of the vitality and self-renewing quality of the archaeology of southwestern Colorado, which has served as a testing ground for new methods and new ideas through five generations of archaeologists. In addition, our understanding of the archaeological history of the area has broadened and deepened through time. The initial focus on the most obvious sites of the Pueblo III

period has been progressively extended to include sites of all ages, from Paleoindian to Protohistoric. Archaeological interpretation has also become increasingly relational and less focused on the individual site. Instead, multiple sites of various types are seen to comprise settlement patterns–the archaeological expression of households and communities occupying a socially-defined landscape. Furthermore, the communities of the past are seen not as social and cultural isolates, but as operating in regional and in some cases, even pan-Southwestern social and environmental contexts.