NUVAKWEWTAQA AND THE CHAVEZ PASS REGION: AN OVERVIEW

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INTRODUCTION

Six years of excavation and survey in the Chavez Pass district resulted in an enormous collection of artifacts and data which have yet to be completely analyzed and reported. In order to efficiently handle analyses and to address the specific issues that were our primary purpose, research has been problem-oriented and accordingly narrow in scope. Individuals involved in the Chavez Pass Project identified aspects of the research design and data base that could be investigated within the scope of a particular inquiry. These individual endeavors have been written up as published and unpublished papers, master's theses and dissertations. Several summaries of the overall research effort have been presented and the data integrated into numerous synthetic works. Much of the literature produced by the Chavez Pass Project has yet to be published. This is not the place to attempt a systematic summary of the data base or results of the various analyses and interpretations that have appeared to date. The aim of this chapter is simply to provide a cursory overview of the archaeological investigations carried out at Chavez Pass and thereby put the project, its findings and the particular studies included in this volume into a tentative context for understanding the role of Nuvakwewtaqa in the region. A brief description of the site and its setting, a history of work at the ruin and a synopsis of the area's prehistory are also provided.

SITE LOCATION

Chavez Pass is located in Coconino County, north-central Arizona, approximately 65 km (40 miles) southeast of Flagstaff (Figure 2.1). The Chavez Pass district consists of numerous sites clustered in proximity to the pass. This impressive Late Prehistoric site complex is in the Coconino National Forest and is managed by the USDA Forest Service. The major site in the district is Nuvakwewtaqa which consists of two major ruin complexes in the SW1/4 of Section 12 and the NW1/4 of Section 13, Township 16 North, Range 11 East (35°47' N, 111°8' E).

The major ruins are located on the west side of Chavez Pass, a natural corridor between the Little Colorado River basin to the north and higher, heavily forested plateaus to the south. This natural access route was utilized by the original historic road between Phoenix and the Colorado Plateau in northern Arizona, following an ancient aboriginal trail and trade route (Fewkes 1904:121). The area is presently rather remote but is readily accessible via all-weather Forest Service roads.

Environmental Setting

Chavez Pass is a natural gap through a rocky escarpment separating the low-lying, arid Little Colorado basin and the cooler, moister plateaus which eventually drop off to the south from the Mogollon Rim. The plateau country is situated over 2000 m above sea level. Nuvakwewtaqa is located at a mean elevation of 2000 m, right at the transition between the lowlands and uplands. The main ruins are on a ridge system within the pass providing a grand view of the Little Colorado desert to the northeast and Mogollon Rim country to the south (Figure 2.2). The major plateaus in the area are Anderson Mesa and the Mogollon Plateau. Chavez Pass is located toward the east edge of Anderson Mesa, forming a saddle that connects it with Chavez Mountain, a smaller mesa to the east. The locational advantage of Chavez Pass is superb both in terms of its topographic access between the Little Colorado basin and the Anderson Mesa uplands and the juxtaposition of different ecological zones.

The escarpment forming the northeastern edge of Anderson Mesa is presently an ecotone and was probably similar during the past. The transition between pinyon-juniper woodland to the south and desert shrubs to the north occurs between 1850 and 1950 m in elevation in the area today, just over a kilometer northeast of the pass. Chavez Pass is currently well suited for maize horticulture with a frost-free season of 130-150 days and mean annual precipitation of 42 cm (Wilson 1969:199; Henderson 1979b:14). Like most of the Colorado Plateau, however, weather is variable from year to year and averages are not the best data for making forecasts. The

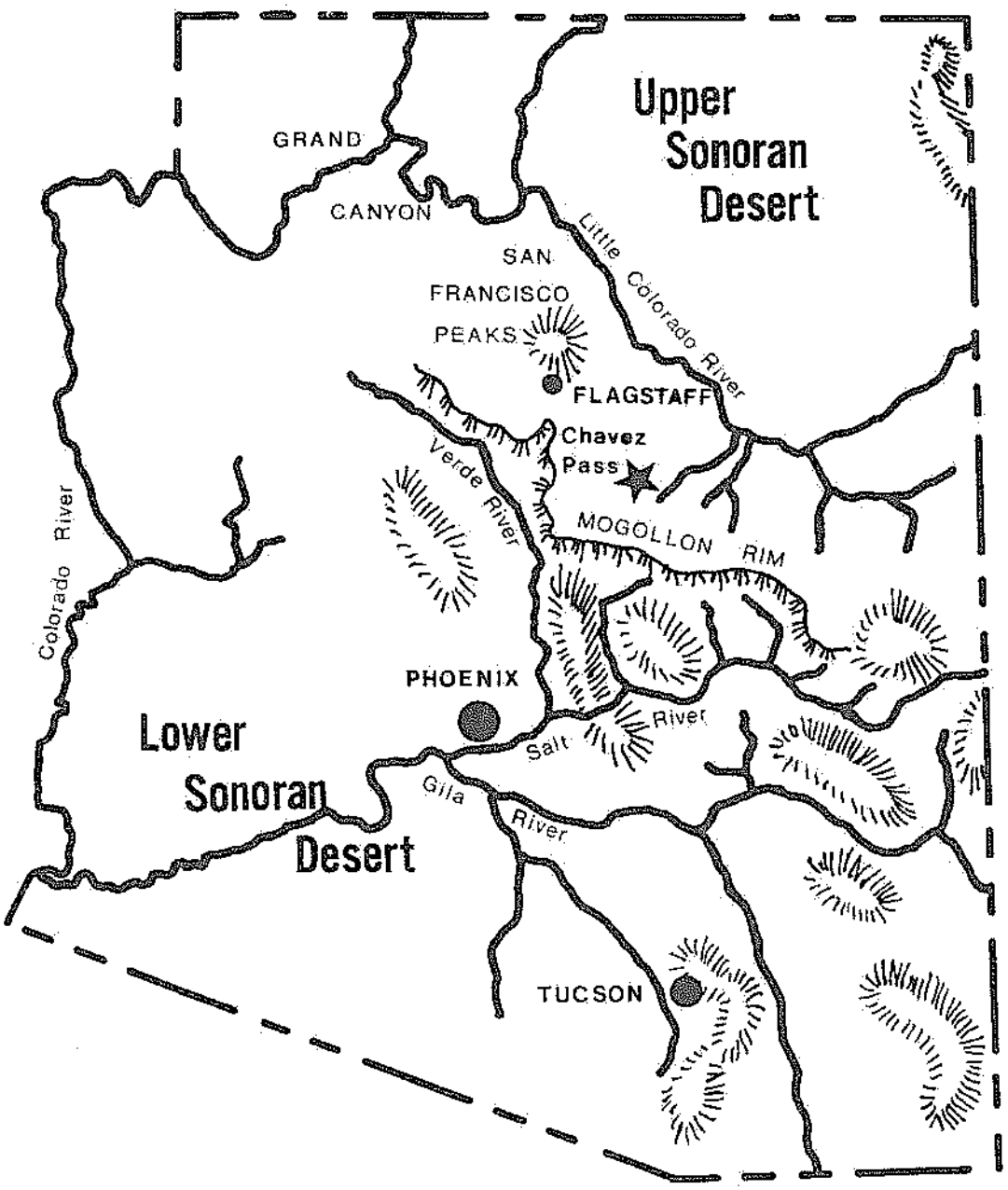

Figure 2.1 Location of Chavez Pass at the southeastern end of Anderson Mesa in north central Arizona.

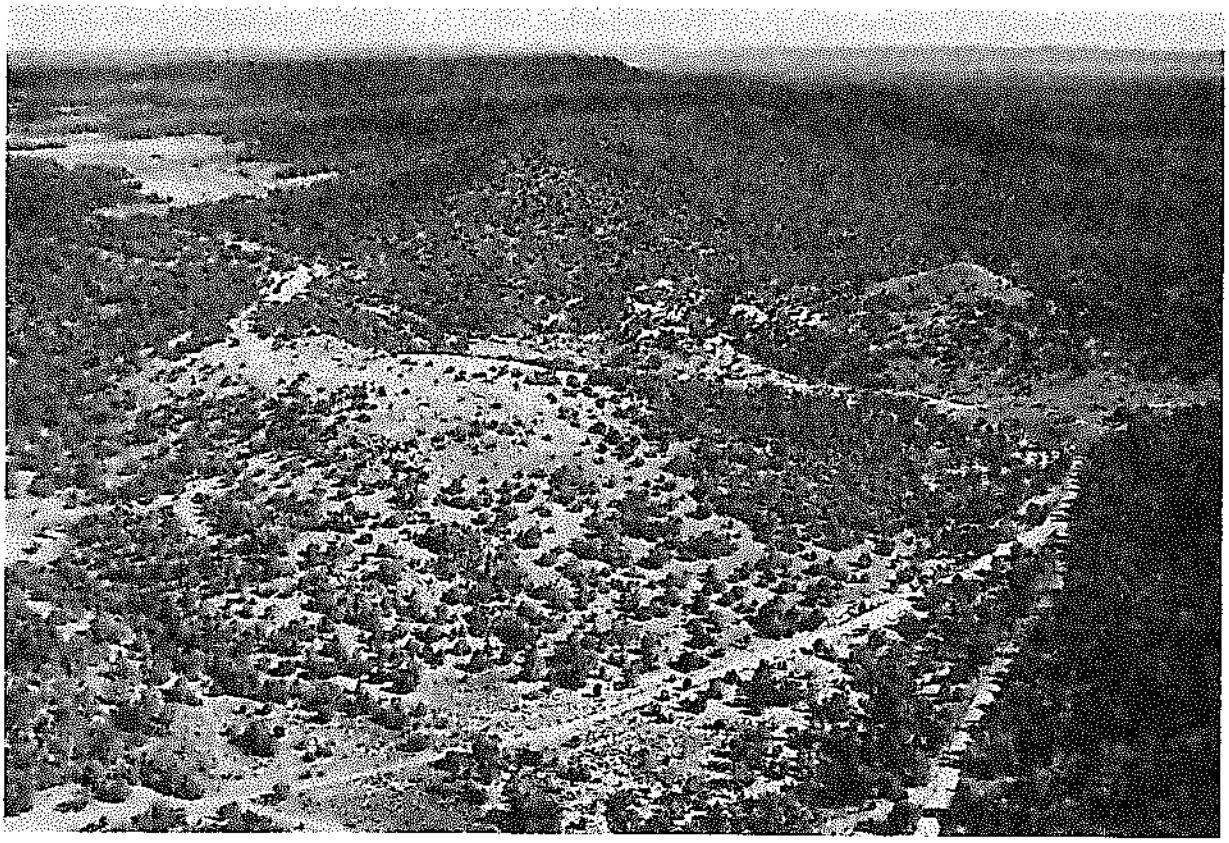

Figure 2.2 Aerial view of Chavez Pass looking northwest along the northern escarpment of Anderson Mesa. Chavez Pass North occupies the prominent hill in the middle of the pass (on the right), the extensive ruins of Chavez Pass South covering the grassy area in the left center of the photograph.

modern pattern of precipitation is bimodal with winter snowfall and late summer thundershowers responsible for most precipitation during the year. Melting snow moistens the ground in the spring and creates ideal conditions for planting, but early summer droughts commonly precede the monsoon season. Temperatures at Chavez Pass are probably comparable to Blue Ridge Ranger Station with a January mean monthly temperature of 28.9°F (range -22 to 67°) and a July mean of 66.7°F (range 36 to 94°) (Sellers and Hill 1974:111).

The only perennial watercourse is the Little Colorado River more than 50 km northeast of Chavez Pass. Intermittent tributaries of the Little Colorado generally drain the southern plateaus toward the northeast. The main stream near Nuvakwewtaqa is Chavez Draw which drains the south slope of Chavez Pass, originally southeast and around Chavez Mountain before an artificial ditch was dug to divert water through the pass into the northern watershed, now feeding a number of stock tanks. All of these streams are intermittent. The most reliable common water sources prehistorically were most likely springs and seeps along the northeastern escarpment of Anderson Mesa. Chavez Well is a spring-fed stock tank to the immediate south of Nuvakwewtaqa. This spring was probably the main water source for inhabitants of the site.

Anderson Mesa is an ancient basalt flow with its origin in the San Franciscan volcanic field near Flagstaff. The top of this plateau is covered with boulders and cobbles of vesicular basalt. The major drainages have cut through the basalt caprock and exposed bedrock of Triassic and Permian age which otherwise occurs only northeast of Anderson Mesa. Chert-bearing limestone of the Kaibab Formation is ubiquitous to the northeast of Anderson Mesa with shale and sandstone of the Moenkopi Formation forming much of the slope. Both limestone and

Table 2.1 Taxonomic Summary of Faunal Remains Identified at Nuvakwewtaqa

TAXON	COMMON NAME
Class: Osteichthyes	Bony Fish
Class: Amphibia	Amphibians
Order: Salienta	Frogs and Toads
Class: Reptilia	Reptiles
Order: Squamata	Lizards and Snakes
Family: Colubridae	Colubrids
Pituophis melanoleucs	Gopher Snake
Family: Crotalidae	Pit Vipers
Crotalus sp.	Rattlesnake
Class: Aves	Birds
Order: Falconiformes	Hawks, Vultures and Allies
Family: Accipitridae	Hawks and Harriers
Aquila chrysaetos	Golden Eagle
Buteo jamaicensis	Red-tailed Hawk
Order: Strigiformes	Owls
Family: Strigidae	True Owls
Bubo virginianus	Great Horned Owl
Order: Piciformes	
Family: Picidae	Woodpeckers
Colaptes cafer	Red-shafted Flicker
Order: Galliformes	
Family: Phasianidae	Quail, Pheasants and Peacocks
cf. *Lophortyx gambelii*	Gambel's Quail
Order: Passiformes	
Family: Corvidae	Corvids
Corvus corax	Common Raven
Class: Mammalia	Mammals
Order: Lagomorpha	Lagomorphs
Family: Leporidae	Hares and Rabbits
Sylvilagus auduboni	Desert Cottontail
Lepus californicus	Black-tailed Jackrabbit
Order: Rodentia	Rodents
Family: Sciuridae	Squirrels and Allies
Spermophilus variegatus	Rock Squirrel
Cynomys gunnisoni	White-tailed Prairie Dog
Eutamias sp.	Chipmunk
cf. *Sciurus alberti*	Tassel-eared Squirrel
Family: Geomyidae	Pocket Gophers
Thomomys bottae	Valley Pocket Gopher
Family: Critetidae	Native Rats and Mice
Neotoma sp.	Wood Rat
cf. *Peromyscus crinitus*	Canyon Mouse
Onychomys leucogaster	Northern Grasshopper Mouse
Microtus sp.	Vole

Table 2.1 (continued)

TAXON	COMMON NAME
Order: Carnivora	Carnivores
Family: Canidae	Dogs and Allies
Canis sp.	Coyote and/or Dog
Urocyon cinereoargenteus	Grey Fox
Family: Mustelidae	Weasels, Skunks and Allies
cf. *Mustela frenatz*	Weasel
Taxidea taxus	Badger
Family: Felidae	Cats
Lynx rufus	Bobcat
Order: Artiodactyla	Artiodactyls
Family: Cervidae	Deer and Allies
Odocoileus hemioneus	Mule Deer
cf. *Cervus canadensis*	Elk
Family: Antilocapridae	Antelope
Antilocapra americana	Pronghorn Antelope
Family: Bovidae	Bovids
Ovis canadensis	Desert Big Horn Sheep

shale occur as *in situ* bedrock at Chavez Pass, Kaibab predominantly on the south side and Moenkopi at slightly higher elevations within the pass itself. *In situ* basalt occurs in the southern locality, evidently filling an ancient drainage, but the main flow is generally situated at higher elevations comprising the major plateau surfaces.

Flora and Fauna

Anderson Mesa is dominated by pinyon-juniper woodland with stands of ponderosa pine along drainages and north-facing slopes, as well as thicker ponderosa forests toward the west and south at higher elevations near the Mogollon Rim. Grassy meadows dominate some of the less forested areas while sage parks occur on benches and some of the lower slopes below the northeastern escarpment. The plateau slopes grade into a predominantly juniper-sage environment as they descend in elevation toward the northeast, gradually becoming a high desert grassland. The Little Colorado basin is currently rather sparsely vegetated. Shrubs and grasses are accompanied by stands of juniper primarily along drainages and rock outcrops.

Herds of pronghorn (*Antilocapra americana*) are fairly common in the grassy terrain north of Chavez Pass while the higher, wooded areas provide habitat for both mule deer (*Odocoileus hemioneus*) and white-tailed deer (*O. virginianus*). Chavez Pass serves as a natural migration route for game animals between the lowland and upland zones. The area is now inhabited by elk (*Cervus canadensis*) which were reintroduced following their extinction in Arizona during historic times. Black bears (*Ursus americanus*) are occasionally spotted on Anderson Mesa. Coyotes (*Canis latrans*) are abundant throughout the area while grey foxes (*Urocyon cinereoargenteus*) are considerably less common. The area abounds with both jackrabbits (*Lepus californicus*) and cottontails (*Sylvilagus nuttallii*). A variety of small mammals and birds also thrive in the area, along with an assortment of snakes and lizards.

Most of these animals have been identified in faunal collections from Nuvakwewtaqa (Table 2.1). Several additional taxa have also been identified in collections from the site, including the big horn sheep (*Ovis canadensis*) which does not presently exist in the area. The most important animals for Puebloan subsistence at Nuvakwewtaqa were mule deer, pronghorn and rabbits in that order of abundance (Brown 1981c). Excavations have provided considerable evidence for hunting and butchering of the artiodactyls, as well as processing and presumably consumption of faunal resources by inhabitants of the pueblo.

HISTORY OF INVESTIGATIONS

Archaeological investigations at Nuvakwewtaqa began in 1896 with work by Fewkes (1898, 1904) who employed a plow to "test" the middens for burials.

Excavations in the middens and several rooms recovered a large collection of pottery and ornaments which are now stored at the Smithsonian Institution. Research during the following half century was limited to acquisition of tree-ring specimens (Douglass 1938:13) and ceramic collections (Colton 1946:72). Analysis of these materials, as well as additional tree-ring samples (Bannister *et al.* 1966:19), indicated that the main occupation of the ruin occurred during the 14th century. A more detailed examination of the Chavez Pass locality was conducted by Wilson (1969:228-232) who used ceramic collections to better document the intensive 14th century occupation of the major ruin complex (Chavez Pass South), but placed the smaller ruin to the north (Chavez Pass North) into the late Pueblo III period, ca. A.D. 1250-1300. Other than the work done by Fewkes, no professional excavations had been carried out at Nuvakwewtaqa before Arizona State University initiated the Chavez Pass Project in 1977. By this time, however, the site had been seriously looted: human skeletal remains littered the midden areas, though potholes were less frequent within the roomblocks.

The preliminary work by Arizona State University was oriented mainly toward salvaging data from vandalized areas and assessing the research potential of the site. The first field season in 1977 included expansion and documentation of potholes, recovery of skeletal materials from looters' backdirt, and a stratified random surface collection of cultural materials from each of the main roomblocks (Batcho 1978). Ceramic analysis of the surface collections was used to refine the intrasite chronology. Like Wilson, Batcho placed Chavez Pass North into the late Pueblo III period and Chavez Pass South into the early Pueblo IV period. However, he proposed that the huge southern ruin complex was not wholly contemporaneous but rather had been sequentially occupied with the largest roomblock representing the culmination of occupation during the late 14th century and a smaller roomblock to the southeast being transitional between it and Chavez Pass North (Batcho 1978:6-16). Subsequent research by the Chavez Pass Project was aimed largely at recovering additional chronological data and further documenting site structure, as well as mitigating impacts to the cultural resources caused by continual looting.

The 1978 field season included controlled excavations in both the middens and roomblocks at Chavez Pass South. A much longer period of occupation was indicated by the excavated materials than by the preliminary analyses based on surface collections. Upham's (1978) ceramic analysis indicated that all three of the main room areas had been contemporaneously inhabited during the 13th century and that much of the site had been occupied during the 12th century as well. Upham (1978:22) hypothesized that Chavez Pass North had been abandoned during the early 14th century, but Chavez Pass South had probably been occupied up to the mid-15th century. His analysis is based entirely on ceramic data. Efforts to retrieve chronometric data from the site have been extremely frustrating. The 1979 field season produced no new chronological data, but did include additional excavations and intensive surface investigations (Plog *et al.* 1980). In addition to large quantities of cultural materials and human remains, the major product of that season was a series of preliminary surface maps of the major room areas at Chavez Pass South (Upham 1982:171-174).

Fieldwork during 1980 focused on the minor roomblocks and extramural areas within the site complex. This work was continued during 1981, though the main thrust of work during that season was intensive excavation and sampling within all three of the major roomblocks. A renewed effort at mapping the site complex also was implemented with the aid of aerial photographs, orthoquads, and high-resolution topographic maps and profiles provided by the USDA Forest Service. Intensive survey of the main complex was also facilitated by aerial reconnaissance and photography. The results of this work included the first comprehensive maps of the whole site complex (Brown 1982b:Figs. 3, 4, pp. 11-12). Supplemented by the intensive survey data and excavations aimed at assessing the relationships between architectural mound topography and pueblo construction, Upham's preliminary maps were revised to depict more accurate room counts and estimate the original height of various parts of the roomblocks at Chavez Pass South (Brown 1982b:Fig. 5, p. 16, Fig.10, p. 33). The 1981 season also produced the first map of Chavez Pass North (Brown 1982b:Fig. 13, p. 41).

Excavations during 1981 provided critical information on the early occupation of Nuvakwewtaqa, as well as supporting Upham's inferred major construction episode at Chavez Pass South toward the end of the 13th century. In attempting to supply Upham's ceramic chronology with needed chronometric data, a large suite of radiocarbon samples was submitted. This endeavor resulted in an extremely problematical series of corrected radiocarbon dates ranging from 480±301 A.D. to "Modern" (Brown 1982b:89-96). The radiocarbon dates were subjected to a detailed reevaluation by Coinman (Chapter 3, this volume) and need not be discussed here.

The final field season at Nuvakwewtaqa took place during 1982. Intensive excavations were again carried

out at both the northern and southern ruin complexes. Important among the findings during that year were a series of datable tree-ring specimens in a hearth at Chavez Pass North (see Chapter 3, this volume). The specimens produced a cutting date of A.D. 1265 which represents the final use of the hearth. Although not necessarily an abandonment date for the roomblock, the date supports Upham's inference of an intensive occupation of Chavez Pass North primarily during the 13th century. Comparable tree-ring dates were obtained from a pitstructure just north of the main complex at Chavez Pass North (Batcho 1982). All of the existing data support the inferred shift in occupation from the north to the south ca. A.D. 1300, despite a lengthy period of overlap in the occupation of the two major ruins.

Also conducted as part of the Chavez Pass Project were a survey of the Anderson Mesa region and test excavations at a number of sites recorded during the survey. The 1978 survey included a 100% inspection of a two-mile diameter area centered on Nuvakwewtaqa (Henderson 1979b). Extensive sampling surveys were carried out during subsequent seasons along with controlled surface collections (Plog *et al.* 1980). The survey data and collections were used extensively in three of the four studies included in this volume. Hundreds of sites were documented with a clear pattern of site aggregation through time at Chavez Pass culminating with the intensive occupation of Nuvakwewtaqa (Henderson 1980b; Plog *et al.* 1980). Small site occupations as early as A.D. 700 were recorded with a gradual increase in site density until large sites began to replace the more numerous small sites between A.D. 1150 and 1250. A major reason for site testing during 1981 and 1982 was to determine whether or not there was evidence for a continued occupation of small sites while large sites in the area became the obtrusive element in the settlement pattern. It does appear that both small and moderate-sized sites were occupied during the 13th century while Nuvakwewtaqa was growing, but there are no chronological data to indicate continued occupations of the hinterland during the 14th century when Nuvakwewtaqa had risen to dominance (Batcho 1982).

SITE DESCRIPTION

The conspicuous ruins at Chavez Pass have been well known to both archaeologists and pothunters in the area for a very long time. Nuvakwewtaqa had been heavily vandalized by the time Arizona State University started work at the site in 1977. Additional looting occurred every spring before fieldwork began and was probably renewed soon after we left the site at the close of each field season. Despite generations of looting, the exceptionally large size and depth of the site have mitigated this destruction to some extent. Huge amounts of architectural rubble covering major room areas have been a detriment to pothunting in much of the ruin. Digging in the midden is easy, however, and most of these deposits have been reworked by continual looting of burials.

The extensive site complex of Nuvakwewtaqa consists of a vast array of large and small surface masonry roomblocks, pitstructures, plazas, cemeteries, shrines, walkways, petroglyphs and other extramural features. Numerous agricultural terraces, grids, garden plots and check dams also occur around the main site complex, as well as the surrounding area. Nuvakwewtaqa consists of two primary habitation areas separated by Chavez Draw. Chavez Pass South, also known as the "South Pueblo," and Chavez Pass North, also known as the "North Pueblo," are situated approximately 400 m apart, but clearly are part of a single site complex. The two main habitation areas, together with the diversity of associated remains comprise the site of Nuvakwewtaqa, sometimes referred to as Chavez Pass Ruin.

Chavez Pass South

The South Pueblo is, by far, the largest ruin in the area. This part of the site is dominated by the ruins of two massive roomblocks accompanied by several smaller roomblocks, numerous single structures and various additional features (Figure 2.3). The two main roomblocks were built in classic terraced style enclosing plazas and additional areas within pueblos that originally stood as high as four stories. A fairly symmetrical organization within the South Pueblo and the gridded layout of the two main roomblocks suggests some degree of contemporaneity and community organization. Major construction occurred between A.D. 1250 and 1350 with most of the South Pueblo inhabited by a large resident population by A.D. 1300 (Upham 1982; Brown 1982b). Relatively episodic, preplanned construction is also reflected in the series of wall abutments characteristic of the South Pueblo. Such a method for joining contiguous walls is structurally inferior, but is much more expedient in a situation where long rows of rooms are desired. Wall abutments are commonly used for relative dating of construction events (Wilcox 1975), but those on much of the South Pueblo are clearly contemporaneous. Long, massive walls extend northwest/southeast through the core areas of the pueblos. These walls were obviously

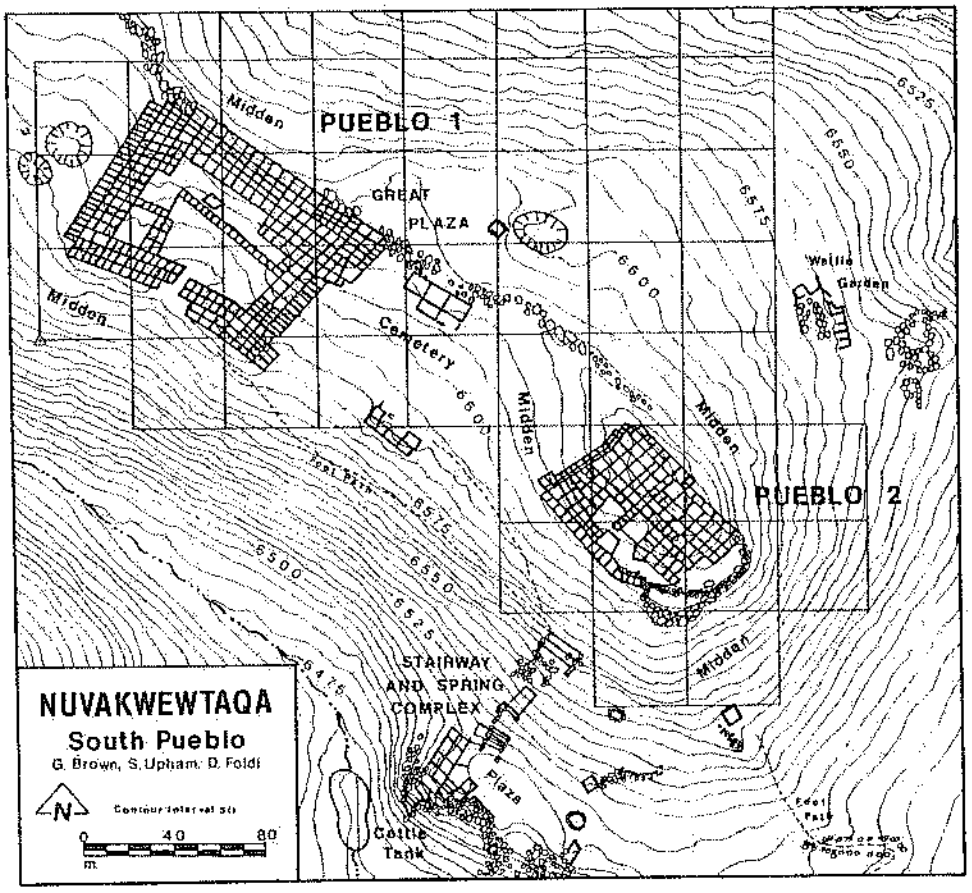

Figure 2.3 Map of the South Pueblo at Chavez Pass.

built first and shorter, northeast/southwest walls then were constructed to subdivide the rows into compartments as well as to buttress the long, heavy longitudinal walls. The large masonry compartments were then subdivided further into rooms by building jacal walls, possibly by the individual households which occupied them (Figure 2.4). Such a pattern seems to reflect planning and masonry construction at the community level.

The masonry of the South Pueblo is generally massive with unshaped basalt boulders the main type of building stone. Masonry is generally uncoursed with boulders set into place with plenty of mortar. Walls are especially massive in the main roomblocks where boulders up to a meter in length were commonly used on the lower portions of the walls which are typically about 80 cm thick. The thick basal walls frequently have rocks purposely selected and placed with flat sides flush to create a smooth wall surface on either side and smaller rubble and trash fill used in the core. The upper walls in some of the multistory parts of the roomblocks were constructed of coursed tabular sandstone masonry. Tabular sandstone coursing also occurs intermittently in areas dominated by cruder basalt boulders, sometimes creating stylized patterns within the generally random masonry style. The small roomblock on the south of the Great Plaza (see Figure 2.3) is unique in the preponderance of excellent coursed, tabular sandstone masonry. Whatever the details of masonry employed, walls were invariably heavily plastered. Both the plaster and masonry are normally a red clay that appears to have been obtained from Moenkopi-derived residual soils. A huge borrow pit for this sediment was investigated on the northeastern margin of the Great Plaza (Brown 1982b:67-72).

The largest roomblock at Chavez Pass South and certainly the largest ruin in the area was designated Pueblo 1. Mapping yielded a room count of 352 ground floor rooms and an estimated total of 685 rooms with up to four stories (Brown 1982b:Fig. 5, p. 16). Pueblo 1 is distinguished by a highly unusual number of small rooms believed to be storage facilities; rooms less than 2 m in

Figure 2.4 View of room excavation in Pueblo 2 looking southeast. Major wall exposed on the right has partially collapsed, but the abutments of a secondary wall (top) and jacal partition (lower) are clear. Stratigraphic section through room fill is exposed at left.

maximum dimension may account for over 70% of the total room count (Upham 1982:185). Pueblo 2 is somewhat smaller and less formal in layout. Mapped ground floor rooms number 171 and the total room count is estimated at 252 with no architecture greater than two stories in height (Brown 1982b:Fig. 10, p. 33). The western side of the roomblock is lined with probable storage rooms; those smaller than 2 m represent an estimated 43% of the total room count (Upham 1982:185). Kivas are difficult to identify in the area because they are generally square or rectangular, thus, without excavation, they do not commonly differ from other large rooms. Those identified at the South Pueblo were unusually large and provided foci for judgmental excavations. Pueblo 1 is distinguished by a great kiva 18 m long and 11 m wide, with a low bench and interior floor vault (Brown 1982b:15-19).

Chavez Pass North

The North Pueblo is an imposing series of ruins scattered around the top and sides of a prominent knoll in the middle of Chavez Pass (Figure 2.5). Much of the architectural remains are buried and not easily mapped without extensive excavation. Excavations at Chavez Pass North revealed several groups of contiguous rooms that lacked surface indications entirely. In addition, three ovoid posthole alignments superimposed beneath surface masonry architecture indicate the presence of earlier pitstructures that were, in some cases, demolished during the clearing of level areas on the hillside for pueblo construction (Brown 1982b:45-54). Defining the site layout has, therefore, been a difficult and tentative job that would require several more years of excavation to do satisfactorily. Our maps of the North Pueblo are preliminary and our room estimates accordingly conservative. By 1981, two kivas, 84 other masonry rooms and four ramadas had been mapped, and some partially excavated, at the North Pueblo (Brown 1982b:85). Only 14 of the rooms (16.3%) fall in the size range that Upham (1982) used to identify storage rooms at Chavez Pass South. Additional masonry rooms were discovered during the 1982 excavations (see Chapter 3, this volume). The actual room count should probably be doubled, at least, to arrive at a realistic estimate of the total number of rooms in the North Pueblo complex. A conservative estimate would be between 150-200 rooms with only about one-third of them actually evident on the modern site surface.

There are several reasons for the greater difficulty in identifying surface masonry structures at the North Pueblo. First, excavations have uncovered the remains of several single-story buildings but have not suggested the presence of multistory architecture. Artificial leveling of benches on the steep hillside and the terraced construction of the North Pueblo resulted in multilevel roomblocks with an external facade similar to that at Chavez Pass South, though rooms were buttressed against the steep slopes of the knoll rather then a 3-4 story core like at Pueblo 1. The walls at Chavez Pass North were not nearly as high; this, in addition to more severe downslope erosion, has resulted in much more deterioration and burial of the structures, especially on the lower slopes. Another process that has made it more difficult to identify masonry structures at the North Pueblo is the incidence of intentional dismantling, presumably to scavenge building materials (Brown 1982b:54-60). No comparable evidence has been observed at Chavez Pass South.

The North Pueblo did have a focal point for community interaction. A large, square structure surrounded by small storage and work rooms is situated in the center of the site on the top of the hill. At an elevation of 2035 m above sea level, this location is the most prominent landmark at Chavez Pass. This structure, 20 m on a side, had probably been roofed, but appears to have been open on the northeast (Brown 1982b:42-46). Although not necessarily a true kiva, the structure did contain a prepared clay floor and a hearth, and appears to be comparable to Sinagua style "community rooms." Low terraces were later built over fill in the structure, presumably for farming, but these features clearly postdate its original use and likely were built after the focus of community interaction had shifted to Chavez Pass South.

There are many other intriguing differences between the North and South Pueblos. While the layout of the North Pueblo is less formal, building techniques reflect preplanned construction, albeit on a much smaller scale than Chavez Pass South. The walls forming the corners on excavated structures are invariably tied to produce a much stronger bond than the wall abutments typical of Chavez Pass South. Masonry is quite variable at the North Pueblo, though semi-coursed walls made of crudely shaped basalt building stones are most common. The frequency of true coursing is much higher than at Chavez Pass South; one structure at the North Pueblo was constructed entirely of finely coursed tabular sandstone. More expedient masonry using unshaped boulders, the dominant pattern at Chavez Pass South, occurs on some of the structures at the North Pueblo, but seems to be largely restricted to footings for perishable superstructures.

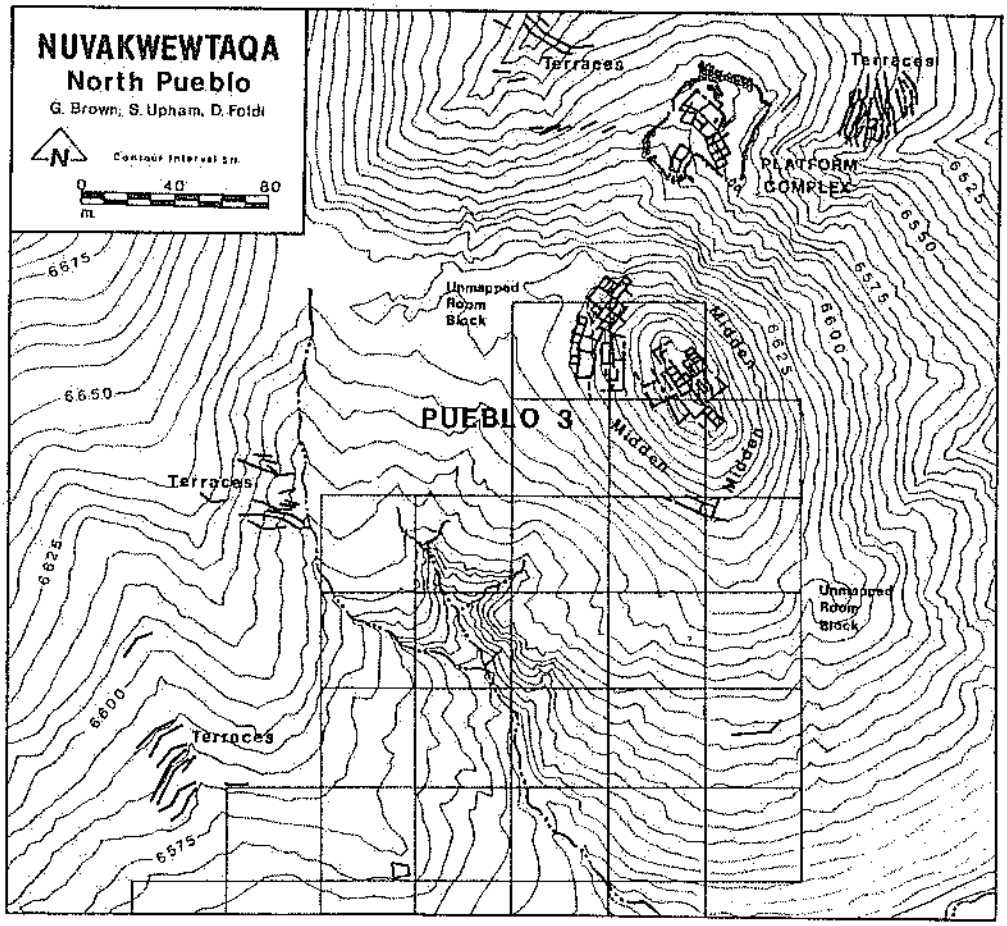

Figure 2.5 Map of the North Pueblo at Chavez Pass.

PREHISTORY OF THE CHAVEZ PASS REGION

The Chavez Pass sequence is a relatively short but dramatic record of human adaptation and change. Preceramic sites are rare in the area, the number and size of ceramic sites increasing gradually between A.D. 700 and 1150, afterwards continuing to increase in size, but decreasing in number as a classic pattern of aggregation develops at Chavez Pass (Henderson 1980b) and elsewhere along the northeastern escarpment of Anderson Mesa (Pilles 1978). The early sites are much less impressive than contemporaneous sites on much of the Colorado Plateau, while the late sites are some of the more spectacular in the Southwest. The trend towards nucleation and the establishment of towns has been observed in many parts of the Southwest (Kidder 1924:338-339; McGregor 1965:322; Martin and Plog 1973:208; Cordell and Plog 1979:420-421; Cordell 1984:245-351). A great variety of explanations have been offered for the development and collapse of these population centers. Research at Chavez Pass was designed to explore the possible causes and consequences of this process of growth (Plog and Merbs 1979).

Chavez Pass is not readily classified into the existing Southwestern taxonomies. Three major cultural traditions overlap in the area: Sinagua, Mogollon and Anasazi. The Sinagua chronology seems most appropriate though the sequence is not well defined with regard to the late phases so well represented at Nuvakwewtaqa. The chronology has not generally been employed in the Chavez Pass research because of this lack of utility and the suspicion that it, like comparable ceramic chronologies, have failed to control socially determined ceramic distribution (Cordell and Plog 1979:420-421; Upham *et al.* 1981). According to this argument, pottery types which require greater production costs, and are therefore more valuable, tend to occur more on large, important

sites regardless of chronological associations (Upham *et al.* 1981; Upham 1982:189-194). Characterization of the Pueblo IV period in terms of polychrome pottery and large towns, and the Pueblo III period in terms of technologically simpler black-on-white pottery and smaller villages, has therefore potentially glossed over significant atemporal variation. Recognition of this inadvertent bias through traditional dependence on decorated pottery for chronological control led Henderson to develop a plainware ceramic chronology for the Chavez Pass region (Chapter 4, this volume).

The chronological issues still need a great deal of continued research. Both the regional chronology and intrasite dating at Nuvakwewtaqa are much too general to rigorously address refined questions about the growth of the settlement system centered at Nuvakwewtaqa. Attempts to overcome this problem have been dealt with in differing ways by different researchers. Reliance on independent dating has been impossible due to the scarcity of datable tree-ring specimens and unresolved problems with radiocarbon dating (see Chapter 3, this volume). At present, there is really no superior way to summarize our data and communicate our findings to colleagues than the extremely general chronological frameworks familiar to Southwestern archaeologists. Such a framework is provided in Figure 2.6. It compares the Sinagua chronology with the more comprehensive, if outdated, Pecos Classification and Henderson's plainware chronology. The Sinagua chronology will be employed in the following discussion of the area's prehistory.

The Pre-Eruptive Period

This period predates the major eruption of Sunset Crater near Flagstaff ca. A.D. 1064 (Pilles 1979:460-464). Colton (1946) originally defined the early part of the Sinagua sequence in terms of three "foci": Cinder Park, Sunset and Rio de Flag. These early phases fit readily into the extant Basketmaker III, Pueblo I and early Pueblo II stages of the Pecos Classification. The entire period is characterized by small sites consisting of between one and five pithouses, low site densities and a mixed economy which emphasized hunting, foraging and plant cultivation (Pilles 1978; Henderson 1980b). The population at this time was dispersed into scattered, small groups that probably followed a biseasonal schedule. A few sites with large community structures suggest interaction among the dispersed hamlets (DeBoer 1976; Breternitz 1959). The typical house type during the pre-eruptive period is a plank-lined pithouse. Although such structures were predominant throughout the Sinagua area until after A.D. 1100 (Wilson 1969), there are exceptions to the rule as early as A.D. 850-900 when a ten-room masonry pueblo was occupied just north of Chavez Pass (Henderson 1979b:43).

In A.D. 1064, the prehistory of the Sinagua was violently interrupted by Sunset Crater which blew its top and continued to erupt periodically over the next two years (Pilles 1979). This catastrophe made human occupation of the immediate area intolerable and covered much of the Cinder Hills area near Flagstaff with as much as 25 cm of volcanic debris. The long term effects were beneficial to agricultural production but clearly harmful to those who witnessed the event at close range (Colton 1946, 1965). It seems unlikely that the eruption had any immediate affect on the prehistoric inhabitants of the Chavez Pass district approximately 75 km to the southeast.

The Post-Eruptive Period

The decades following the eruption of Sunset Crater in the Flagstaff area are characterized by a great increase in site density and cultural diversity. Changes in the prehistory of the area are so great that Colton (1932, 1937a) interpreted the evidence as a land rush by various peoples to exploit the soils enhanced by the cinder mulch resulting from the recent volcanism. Architectural variability is so great that he originally defined three foci for what now is regarded as a single phase lasting less than a century (Colton 1946). For lack of a better label, the interval following the Sunset eruptions is referred to as the Angell-Winona-Padre phase, each focus thought by Colton to represent a separate migration into the Flagstaff area. A diversity of surface structures and masonry-lined pithouses have been dated to this phase, ca. A.D.1066-1130 (Colton 1946; Wilson 1969; Pilles 1979).

Pilles (1978, 1979) has noted that the marked increase in site densities and variability in architectural and artifactual remains that Colton used to infer a land rush from surrounding areas is present elsewhere in the Sinagua area and appears to be part of a more general pattern than originally supposed. Whether or not Colton's cinder mulch hypothesis has merit, there is clearly an increase in horticultural activity during the post-eruptive period. This trend, however, appears to begin prior to the Sunset Crater eruptions, and is probably reflected in the shift from high to consistently lower elevation site locations in the Flagstaff area around A.D. 1000 (Hevly 1982). There is a pronounced increase in the use of water and soil control features throughout much of the Colorado Pla-

DATE (A.D.)	PERIOD	PHASE	PECOS CLASSIFICATION	PLAINWARE ASSEMBLAGE
1450				
		CLEAR CREEK	EARLY PUEBLO IV	
1300				CHAVEZ DOMINANT
		TURKEY HILL	LATE PUEBLO III	
1200	POST-ERUPTIVE	ELDEN	EARLY PUEBLO III	ANDERSON LATE DOMINANT
1130		ANGELL-WINONA-PADRE	LATE PUEBLO II	DIABLO MOGOLLON DOMINANT
1064-1066	PRE-ERUPTIVE	RIO DE FLAG	EARLY PUEBLO II	ANDERSON EARLY DOMINANT
900				
		SUNSET	PUEBLO I	
700				
		CINDER PARK	BASKETMAKER III	
500				

Figure 2.6 Sinagua archaeological sequence.

teau at this time (Plog and Garrett 1972). However, if people had already begun intensification of their horticultural systems, the possibility that exceptionally rich soils in the Flagstaff area might promote an influx of population seems all the more plausible. Contemporaneous events in the Chavez Pass area are of great interest because Sunset Crater did not significantly affect the soils there.

An increase in settlement variability has also been noted in the Chavez Pass area during the transition between the pre-eruptive and post-eruptive periods. Like Flagstaff, site densities increase with habitations regularly spaced along the entire northeastern edge of Anderson Mesa throughout the pinyon-juniper zone (Colton 1946; Henderson 1980b). A number of villages, some of moderate size, appear during the early post-eruptive period. There is a clustering of both habitations and field houses on the top and sides of Chavez Mountain (Henderson 1979b:44). Ceramic evidence from Chavez Pass North indicates that it was probably inhabited at this time,

though major construction and occupation at the North Pueblo had not begun (Upham 1978; Brown 1982b; Coinman, this volume). Still, the pattern of aggregation had begun to emerge at an earlier date than in most of the northern Sinagua area.

During the Elden phase, site clusters occur at various key locations on Anderson Mesa and the Flagstaff region (Wilson 1969; Pilles 1978; Henderson 1980b). Although there is a great increase in the number of sites, this is largely attributable to a significant increase in field houses. Many sites occupied during this time are characterized by relatively small, expedient structures with specialized assemblages oriented toward food production, processing and storage (Pilles 1978). In the Chavez Pass district, site density reaches its peak of four sites per square km (10 sites per square mile) and sites increase to a mean size of seven rooms at this time (Henderson 1979b:46). There are still relatively minor indications of habitation at Nuvakwewtaqa, though certainly the abundance of later deposits may be masking such evidence. Masonry architecture was the rule for this phase, but pitstructures were still occupied throughout the Sinagua area, some in and around pueblos and some probably used as kivas (Wilson 1969:24).

The status of the succeeding Turkey Hill phase is uncertain. Very few sites have been identified in the Sinagua area. The problem of socially determined ceramic distributions has probably influenced the scarcity of "Turkey Hill" sites, those lacking orangewares and polychromes simply being classified as earlier sites. However, even sites dated on the basis of plainware ceramic analysis decrease in frequency during the 13th century (Henderson 1979b; Chapter 4, this volume). Both habitations and limited activity sites are less common in the Chavez Pass district, while the trend toward larger sites continues. The main occupation of Chavez Pass North occurred during the 13th century and there is certain evidence of occupation at Chavez Pass South during this time (Upham 1978, 1982; Brown 1982b; Coinman, Chapter 3, this volume). Organization of the community at Chavez Pass appears to be a continuation of the site clustering pattern with numerous smaller roomblocks situated around the main pueblo at Chavez Pass North. The locality also includes at least one pitstructure dated to this interval (Batcho 1982). The occupation at Chavez Pass North consisted of well over 200 individuals (cf. Brown 1982b:85). Given additional evidence of habitation elsewhere at and around the main ruin during the 13th century, it seems likely that the midcentury population of Nuvakwewtaqa had exceeded 500 persons. The decrease in site density, therefore, had nothing to do with a decline in the population of the Chavez Pass district.

A similar pattern of settlement growth is evident elsewhere in the Anderson Mesa region. At Anderson Pass, 15 km northwest of Chavez Pass, a cluster of Elden phase sites appears to have been abandoned during the 13th century (Chapter 6, this volume; Peter J. Pilles, personal communication, 1980). The decline of this settlement cluster coincides with the establishment of larger sites a few kilometers south in the Grapevine drainage. The Pollock site is a 13th century pueblo associated with numerous smaller masonry rooms, pitstructures and a kiva (McGregor 1955, 1956). An intensively terraced agricultural system is also associated with the ruin, the entire site complex in many ways resembling that at Chavez Pass North. The main roomblock consists of approximately 65 rooms and a kiva; it is therefore smaller, though more unified than the North Pueblo at Nuvakwewtaqa. Like the North Pueblo, the Pollock site appears to consist exclusively of single-story architecture (Beeson 1957). Kinnikinick Pueblo, located on the canyon rim to the west of the Pollock site, is a much larger ruin. Although its main occupation dates to the 14th century, initial construction probably began around A.D. 1250 (cf. McGregor 1942). In sum, the 13th century settlement pattern resembled that at Chavez Pass: a rather loose aggregation of various units preceded by a clustering of small sites during the 12th century. In both cases, the pattern of aggregation coalesced into one of true nucleation toward the end of the 13th century when construction of large, centralized pueblos was begun.

Only one additional case can be made for a substantial 13th century population aggregation in the area. Near Flagstaff, Old Caves Pueblo is an agglomerated pueblo built on a hilltop and occupied primarily between A.D. 1250 and 1300 (Colton 1946:37-38). The site layout and setting are similar in some ways to the North Pueblo at Nuvakwewtaqa. Intensive survey and mapping of the unexcavated ruin resulted in an estimate of 145 rooms in the main complex (Chapter 6, this volume). Several additional pueblos in the Flagstaff area were occupied well into the 13th century, but occupation by A.D. 1250 was evidently confined largely to Old Caves Pueblo. There is no evidence that the Flagstaff area was occupied during the 14th century when Anderson Mesa witnessed the heaviest occupations of the northern Sinagua region. These occupations were limited primarily to three very large sites—Kinnikinick, Grapevine and Chavez Pass South.

The 14th century in the Sinagua area has traditionally been included in Colton's (1946) Clear Creek focus.

This phase is not well understood because of the scarcity of sites which date to this time. The only known habitations in the northern Sinagua area are those on Anderson Mesa. The intensive occupation of Chavez Pass South is dated to the 14th century with major construction of the two southern roomblocks occurring during the latter half of the previous century. A conservative estimate of the 14th century population of Nuvakwewtaqa is between 1500 and 2000 individuals (Upham 1982:184; Brown 1982b:85). There is evidence of 14th century activity at Chavez Pass North, but it does not appear that a significant occupation occurred during this time. There is little evidence of contemporaneous occupation in the Chavez Pass district outside of the main ruin complex (Henderson 1979b, 1980b; Batcho 1982). Elsewhere on Anderson Mesa habitation was focused on two large pueblos on the rim of the Grapevine drainage. The largest of these is Kinnikinick Pueblo with an estimated total room count of 235 rooms, while Grapevine Pueblo is smaller, consisting of an estimated 133 rooms (Chapter 6, this volume). Both pueblos are unified multistory roomblocks associated with springs. The Pollock site, located nearby, was evidently occupied after A.D. 1300, but was probably abandoned soon afterward.

The nucleated 14th century populations were supported largely by intensive agriculture. The most complex and intensive agricultural systems in the northern Sinagua area are associated with the Clear Creek phase settlements (Pilles 1978; Upham 1984). There is also abundant evidence of intensification of nonsubsistence production at the late sites on Anderson Mesa (Cordell and Plog 1979; Upham 1982; Upham and Plog 1986; Brown 1981a, 1982a, 1982b, 1986). At Nuvakwewtaqa, this is apparent in both the abundance of exotic artifacts and raw materials recovered. Fabrication of items from materials imported over great distances is reflected in both worked and unworked marine shells (including *Conus* tinkler blanks broken in manufacture), argillite from the Verde Valley, obsidian from a number of sources, and additional nonlocal lithic materials, all common in both raw form and as artifacts. Many other exotic artifacts and raw materials occur, but evidence for on-site working of the materials is less certain. The abundance and variety of such remains is so great that Nuvakwewtaqa has been interpreted as a specialized center for craft production and trade. Much of the research presented in the present volume is concerned with better documenting the actual manufacture of artifacts so that procurement and distribution can be more clearly understood.

RESEARCH ORIENTATION

What caused the shift from scattered small hamlets to aggregated site clusters and ultimately nucleated villages and towns? Why did the towns fail? Noting the similarity of this growth process to the evolution of towns elsewhere in the world, the Chavez Pass research design stressed the interaction of nucleation with other processes caused by population increases (Plog and Merbs 1979). While alternative hypotheses were identified, the research design was oriented toward testing of a general model in which social and economic differentiation, specialization, stratification and nucleation result from agricultural intensification caused by population-resource imbalances. The model views nucleated sites such as Nuvakwewtaqa as the product of an increasing economy of scale with larger and denser populations turning to more labor-intensive food production strategies. Much additional fieldwork will be needed to test the model at Chavez Pass, but the intensity and scale of agricultural production has been demonstrated (Henderson 1979b; Upham 1984). The timing and interrelationships among the various additional components of the model are most in need of further research.

The papers which follow are all concerned with the production of nonsubsistence commodities. They examine economic differentiation and specialization as reflected in the procurement and production of raw materials and goods. Chronological control is obviously essential to testing aspects of the general model. The two chapters that follow adopt chronology as their methodological focus, but also examine patterns in the manufacture and exchange of ceramic vessels. The last two chapters take a closer look at the manufacture and exchange of pottery and lithic artifacts, respectively. They are especially concerned with differentiation and specialization within regional systems of production and exchange. Together, the papers help elucidate the complexity and diversity of the Chavez Pass regional system. Certainly, much more work is needed to answer all of the questions considered in this volume. Refinement of both the regional chronology and the Chavez Pass sequence is especially important for precisely identifying the diachronic and synchronic interaction of variables in the proposed model or any alternatives. These limitations are acknowledged by all of the authors in their attempts to explicate patterns of an accordingly general nature which can be supported empirically and compared with other regions where similar or different patterns have been identified.