THE SINAGUA AND AGGREGATION:
AN INTERDISCIPLINARY APPROACH TO CULTURAL DEVELOPMENT

Joshua A. Piker
Honors Thesis in Anthropology
Oberlin College
May 16, 1989
Archaeology is, like any good sub-field of anthropology, concerned with the descriptions of, and comparisons between, cultural systems. The evidence used by archaeologists is, however, often of a very different nature than that used by ethnographers or linguists. Language is, of course, not preserved in the archaeological record, and many of the everyday behaviors that ethnographers are able to take for granted are invisible at a distance of two thousand years. This paper will be concerned with the study of social organization and group dynamics. However, determining the "structure" of a prehistoric society is notoriously difficult. Benson has stated that "Social structure has no unambiguous referents in the archaeological record" because "1) it requires relationships and not just units of variables, 2) relationships between elements of social structure are not unambiguous in living societies, 3) structural units are analytic categories of social scientists and are not isomorphic with corporate groups at any scale ... and thus have
unspecifiable or widely varying material correlates" (Benson 1985:183).

Benson is undoubtedly correct in emphasizing the ambiguities inherent in attempting to define and explain a prehistoric culture's social organization. However, it seems to me that it is possible, through careful examination of the evidence, to eliminate many of these ambiguities. By piecing together information derived from different sources and diverse disciplines, archaeologists can construct a reasonably accurate model of the whens, whys, and hows of prehistoric social organization. This paper is an example of such an approach.

The archaeological record, despite its rather obvious drawbacks, does grant researchers the luxury of an unbroken record of prehistoric cultural activities stretching back as far as they are prepared to look. Ethnographers are, by the very nature of their discipline, confined to descriptions of cultures based on observations obtained during a relatively few years in the field. For this reason, much of what is produced by these scholars appears to be thoroughly synchronic. Even the finest ethnographies resemble a snap-shot of a culture. Archaeologists are forced to deal with much larger units of time than other anthropologists. On many archaeological sites, the simple act of placing a trowel in the dirt will take the researcher through a two hundred year accumulation of soil and cultural debris. For this reason, archaeology is uniquely suited to the task of describing and analyzing cultural change (Dean 1988). In this paper I will take advantage of this unique chance to discuss social and cultural evolution (and devolution). I will examine
how and why certain cultural patterns changed, and what effect these changes had on the people who participated in them. By focusing the investigation on change within a given culture, a greater understanding of the processes and mechanisms involved in societal change in general will be achieved.

It is crucially important that, before I go any further, I make clear the differences inherent in the terms "social organization" and "social structure". Benson cogently states that "social organization is the size, scale, and nature of corporate groups (broadly defined as a group that acts as a unit); social structure is the relationship between groups" (1985:181). In other words, a clan or a moiety is a social organization; ranked or egalitarian is a structure. This distinction is critical in gaining an understanding of a prehistoric (or, for that matter, a historic) society. Much of this paper is concerned with changes in social organization and what those changes mean to the social structure. I shall address, either directly or obliquely, such questions as: what effect does the appearance of a moiety-based system have on a previously egalitarian population; how does the appearance of a system consisting of a groups of clans, tied together by various sodalities, aid or interfere with the formation of a recognizable class of elites; and is it possible that a non-egalitarian society could have developed prior to the appearance of clans, sodalities, and other integrative cultural constructs?

The culture with which we will be chiefly concerned with is the Sinagua. These people lived at the base of the San Francisco
Mountains in north-central Arizona, near the present-day city of Flagstaff. Researchers have found evidence of this culture in the area bounded on the north by Deadman's Wash, on the east by the Little Colorado River, on the west by the headwaters of the Rio de Flag, and on the south by East Clear Creek (Madsen 1982; Colton 1968). The Sinagua occupied all or part of this huge area from A.D. 600 to 1300, often shifting their settlements from place to place in response to ecological, social, and political imperatives. Throughout this time, their subsistence system incorporated, with varying degrees of emphasis, agriculture, gathering, hunting, and trading. Their social structure has traditionally been thought of as egalitarian, with families living in isolated pithouses, small pithouse villages, or nucleated pueblos, depending on the time period. Intra-settlement, inter-settlement, and inter-regional organization was believed to be at a minimum. These tenets of the past have been challenged recently by scholars who believe that the social system of this period was more centralized and less egalitarian than was previously thought (Plog 1974, Upham 1982, Hohmann 1982). Much of this paper will focus on this continuing debate. Most researchers, no matter where they stand on the egalitarian vs. hierarchical debate, agree that the Sinagua experienced a period of population aggregation and nucleation sometime after A.D. 1000 (the exact date is contested). This period of demographic and social change will be the setting for much of this paper. I will first address the question of what caused the observed effect. For example, Glassow (1977) suggests six factors which he believes can lead to aggregation: the exchange
of large quantities of goods; frequent engagement in cooperative activities; communication between groups that is both important and frequent; communal houses designed to maximize storage and/or heat retention; marriage patterns; and nearness to crucial social and economic resources. Did any or all of these behaviors occur among the Sinagua of the late 11th and early 12th centuries? If so, is there one factor which we can identify as the prime mover in the aggregation process?

From that point on, the paper will focus on the effects such a change had on the prehistoric inhabitants of the Flagstaff area. Given that "cultures, past and present, may be profitably seen as sets of interlocking and interdependent human actions and systems which are operated in concert" (Kelley 1971:2), it can assumed that changes in one aspect of a culture will generate changes other areas. However, the form these secondary changes may take is by no means predetermined. A system based on hierarchical authority and intensive agriculture could emerge as easily as a system based on egalitarian decision-making and limited farming. The type of system or systems that arouse in conjunction with the population aggregation of this time must be determined; and, perhaps more importantly, I must demonstrate why this particular adaptation(s) was implemented (at least for the time being) at the expense of other, seemingly equally attractive, strategies.

In order to answer these question, a wide range of archaeological, ecological, and ethnographic evidence must be examined. My analysis in based on archaeological materials, but
to exclude other types of evidence seems foolish. Binford (1972b:95) believes that the evidence found in the archaeological record is sufficient in and of itself to provide archaeologists with a clear picture of a prehistoric culture. He states that "the formal structure of artifact assemblages together with the between element contextual relationships should and do present a systematic and understandable picture of the total extinct cultural system". However, I do not share his optimism about the completeness of the archaeological record. In this paper I will utilize archaeological sources from the prehistoric Southwest, in general, and the Flagstaff area, in particular; and these will be supplemented by modern ethnographic evidence drawn from work done among the Western Pueblo. While I believe that "one of the major goals in archaeology is to identify behavioral and organizational patterns not found in the present" (Upham 1982:53), it seems to me that the observable present can give researchers hints about past cultural behaviors and processes. I am striving for "a union of the two approaches, the culture history and the culture process" (Darling n.d.:7).

Ethnographic evidence has several advantages over what can be gleaned from archaeological sources. In the first place, the information that can be gathered by ethnographic observers is much more detailed with respect to people's everyday actions than archaeological data can ever hope to be. A study such as Bradfield's (1971) or Ford's (1968) would be impossible using archaeological sources. Both authors use information gathered from Indian informants to determine how the Pueblo system of agriculture functions. Their data on the division of labor
involved in food procurement and processing, and the information they amassed on the division of resources are much more comprehensive than anything published by archaeologists. In addition to being more detailed, ethnographic sources preserve something which archaeological sources can only hope to touch on indirectly: a people's perceptions, beliefs, and values. These data are critically important. "The way in which people respond [to the constraints of the material world] is influenced by the way in which they perceive the world and by their systems of beliefs and values" (Wetterstrom 1978:81). People's behavior is shaped by their impressions about, and understanding of, the physical and social environment in which they exist. Moreover, different peoples recognize different aspects of the environment as impacting on their lives. In other words, a given group of people may not believe that a certain phenomena has any effect on them at all, regardless of what the "objective" evidence might indicate. As a result, the cognized environment that people react to may be quite different from what an observer may see as the effective environment (Ford 1968). Without a basic understanding of how a people view their physical and social surroundings any study of that group will be inherently flawed. Ethnography is absolutely essential for achieving this understanding.

This is not to say that there are not problems in the use of ethnographic data in an archaeologically based study. Zubrow (1976) has pointed out that ethnographic scholarship, because of
its relatively synchronic nature, tends to portray societies as being static entities. Archaeologists avoid this pitfall. Ethnographic evidence is useful in that it provides researchers with a detailed picture of a culture during a known period of time; but anthropologists have to be aware of the fact that societies are constantly in a state of flux and that the current existence of a particular cultural trait or behavior does not conclusively prove that it existed in prehistoric times. For this reason, analogies which attempt to project a present cultural system onto an extinct society are tenuous at best. Great changes can occur in a very short time, and the further away one gets in time, the greater the chance that fundamental changes may have occurred. In the case of the Hopi, Wilcox (1987:3) believes that the 400 years of European contact has "resulted in great changes in Pueblo demography, settlement size and location, and economy"; and Cordell (1977) has documented differences between Hopi hunting patterns and those of prehistoric Pueblo groups.

Evidence such as this has prompted Lightfoot to state that, "given the external forces at work over the last 300 years, one must question seriously the efficacy of employing contemporary Pueblos as a model for reconstructing past political organizations" (Lightfoot 1987:48). Although Lightfoot is certainly correct in asserting that there have been dramatic changes in Pueblo society over the last few centuries, he is, in all likelihood, mistaken in suggesting that modern Pueblo culture is useless in helping us to get a handle on prehistoric patterns of behavior. Instead of throwing up their hands in despair over
the inevitable changes involved in the passage of time and clash of cultures, anthropologists should attempt to work through the maze of historic and ethnohistoric data which they have available to them. If this is done properly, then I believe that it is to determine which pieces of Pueblo culture are distinctively Puebloan and which are accretions which have been grafted on over time. I accept Dozier's caution that "analogy to ethnographic groups should be restricted to contiguous areas where the history, prehistory, and distribution of sociocultural and linguistic groups are fairly well known" (Dozier 1970:204); but I assert that the Southwest is one place where these criteria are met, and that, as a result, ethnographic analogy can and should have an important role in archaeological investigations of this area's past.

This paper will be focused on the Hopi Indians of Northeastern Arizona. I have chosen them as the primary historic reference group for the Sinagua for several reasons. In the first place, there is a well documented historical connection between the two groups. McGregor believes that the Sinagua "were ancestral to, and contributed to, the development of Hopi culture" (McGregor 1943:296). Archaeological and ethnographic sources point to a migration from the San Francisco Peaks region to the Hopi Mesas in the late 13th and early 14th centuries. Stanislawski (1963) has compiled a good deal of data which suggests that the population of the Mesas rose sharply in the early 1300s, about the same time the Sinagua were abandoning the Flagstaff area (Colton 1960). In addition, he found that certain
material traits that are recognizably Sinaguan appeared in the cultural repertoire of the inhabitants of the Hopi Mesas at this time.

Ethnographically, transcripts of the Hopi's oral legends suggest that at least part of the tribe originated in the San Francisco Mountain region (Stanislawski 1963). Finally, several excavations on Sinaguan sites have been conducted with the help of Hopi laborers and observers. These Hopi have stated that the structures and objects that were uncovered were definitely similar to what they were accustomed to seeing in their own villages (McGregor 1943, 1955). The excavation of "The Magician's Burial" at Ridge Ruin (McGregor 1943) is an especially dramatic example of this phenomenon. In this case, the excavators uncovered an extraordinarily rich burial of a 35-40 year old male, dating from A.D. 1100-1125. The Hopi informants present at the site were certain that they could "definitely identify the ceremony represented by the [burial] objects" (McGregor 1943:295). Perhaps even more impressively, the Hopi, upon being shown several of the artifacts, were able to predict, and accurately describe, some of the other objects that would be found.

These pieces of evidence suggest that there was indeed a connection between the Sinagua and the Hopi. This is important in and of itself, but it would not be enough to warrant specific comparisons between the two societies unless archaeologists could account for the six hundred years that have passed since the Sinagua were incorporated into the Hopi world. Fortunately, through the study of Spanish colonial records and the papers and
diaries of early American explorers, anthropologists have been able to obtain a fairly accurate picture of the nature of Hopi societal change over time (Dozier 1970). These records are, admittedly, a mixed blessing due to the bigotry and ethnocentrism of the early observers, but, with a proper understanding of the biases and motives of the authors, they can be made to reveal a good deal of information about the Pueblo's contact and post-contact culture. What emerges from such a study is a record of a culture which has, despite being beset by numerous pressures and catastrophes, been able to maintain "substantial continuity in [their] political structures and decision making organizations" (Upham 1982:199). In addition, of all the different groups which make up the Western Pueblo, the Hopi have been least affected by European contact because "the Spaniards did not return in force [to this area] after the Pueblo Rebellion" (Eggan 1950:18).

Since the Hopi have experienced "remarkably little changes in the fundamentals of their culture" (Hill 1970:19), and since anthropologists have been able, through historic and ethnographic records, to document what has changed, it seems that they are a fine example of a tribe which is well-suited for the purposes of cross temporal analogy.

It is important at this point to spell out exactly how the ethnographic data will be used in this study. I believe, as I stated above, that "studies of modern material culture may well inform us about the past" (Cordell et al. 1987:568) if proper cautions are taken in the choice of subject groups. However, this acceptance of ethnographic evidence should not be read as an
attempt to make ethnographic analogy the touchstone on which all of archaeology's theories must be tested. Rather, ethnographic materials should be employed as "background information" (Binford 1972a:60) to aid researchers the process of constructing models of prehistoric behavior. These models must then be tested by making reference to archaeological data. If no evidence is found to support them, then they must be rejected or revised. Too often archaeologists have accepted ethnographic models without testing. No matter how attractive or alluring a model may be, it must be testable within the archaeological record. "Plausibility is not a substitute for evidence" (E. Bright Wilson, quoted in Hill 1970b:13).

This paper will utilize ethnographic, archaeological, and ecological sources to construct and test a model of Sinagua cultural change. I will first present a description of the past and present environment of the Flagstaff area. That will be followed by a relatively brief discussion of the culture history of the region before A.D. 1066, and by a more in-depth treatment of the period from A.D. 1066 to 1300. By presenting the data in this manner, I will be able to determine how and why the Sinagua social and political structure changed through time. I contend that the history of the Sinagua culture is characterized by a trend towards increasing economic, social, and political complexity, and that this trend culminated in the emergence of a system which was dominated by a hereditary group of elites whose power rested on economic connections and the control of key rituals. In short, this system was not characterized by an egalitarian system of social structure, and almost certainly bore
little resemblance to the relatively uncomplex tribal system that many anthropologists have attributed to prehistoric Pueblo peoples.
CHAPTER 2:  
THE ENVIRONMENT OF THE FLAGSTAFF AREA

If anthropologists are to gain an understanding of the events which occurred in the past, they must first be able place them in their ecological context. Without this, they will be unable to determine how the prehistoric systems operated, or, indeed, why these systems were chosen at all. The modern city of Flagstaff is located in a ponderosa pine forest at an elevation of 2,160 meters. The San Francisco Mountains rise on the outskirts of town to a height of 3,840 meters. These mountains are the highest natural features in this part of the state. From the base of these peaks, the land slopes down gradually in all directions. The flora and fauna of the area change as the elevation drops. Between 1,980 and 2,280 meters, the country is dominated by ponderosa pines. Junipers and pinyons are found only occasionally in this zone. Below 1,980 meters, the country assumes a more open character, with the major flora consisting of pinyons and junipers. The pinyon/juniper zone fades out gradually until, at about 1,370 meters, the country becomes a semi-arid, open grassland, broken here and there by small bushes
and stunted trees (Madsen 1982).

This pattern of vertical zonation is produced by the interaction two variables: temperature and precipitation. In general, the higher one goes, the colder and wetter the environment becomes; and, conversely, the low-lying areas are characterized by a hot, dry climate. This produces a situation "in which the upper altitudinal limit of a species is usually determined by its ability to function in low temperatures and its lower range is controlled by its resistance to drought" (Hevly 1988:95).

Precipitation is, in general, low for all of the zones discussed in this paper. Even the ponderosa zone, which is by far the wettest of the areas considered, receives only 41-56 centimeters of effective moisture annually (Madsen 1982:9). In contrast, the area around Winslow, Arizona, (1,524 meters) receives only 11 centimeters of rain a year. Precipitation in these zones is "not only low but very uncertain, varying from half to twice normal" (Forde 1931:360). Marked departures from the mean occur both spatially and seasonally. The variations between zones have already been discussed, but there are also significant differences in intra-zonal precipitation. Kelley (1971:40) refers to "the highly localized nature of summer rains and winter snow falls" in the San Francisco Mountain area. As this implies, it is quite possible for one area to receive a thorough soaking while another, half a kilometer away, remains bone dry. Bradfield (1971) has even documented cases among the Hopi in which one man's fields received rain while his neighbor's
crops (literally ten meters away) were missed entirely. In general, the distribution of the rainfall "depends on exposure, prevailing winds, and distance from the mountains" (Hevly 1988:93). However, anyone who has spent the summer in this area can attest to the fact that, from a ground-level perspective, the pattern of rainfall seems to be at best capricious, and, at the worst, malicious.

The seasonal pattern of rainfall exhibits the same degree of variation as the spatial pattern. In general, precipitation occurs in two distinct episodes: violent thundershowers from July to September, and snow from December to March (Colton 1960, Hevly 1988). The fall is usually dry and clear, with occasional short rainy spells; and the months of April, May, and June are characterized by dry, windy weather. During these months wind velocities average twelve miles per hour (Hevly 1988).

It is not unusual for the summer "monsoons" to be late or for the winter snowpack to be less than hoped for; and it is not unheard of for a rainy season to be skipped entirely. This can have a catastrophic effect on the flora of the area, especially the cultivated plants. Page has noted that, for the Hopi, "a 35 percent reduction in yearly precipitation correlated with a 60 percent reduction in crop yields" (quoted in Minnis 1985b:125). Admittedly, the Hopi inhabit a more marginal environment than that which is found around Flagstaff, but this figure highlights the vulnerability of foodcrops to the inevitable fluctuations in annual effective moisture. This is especially true in the Flagstaff area because of the relative lack of permanent standing or running water. There are no rivers in this area which are
reliable on a year-round basis, and "there are about 20 springs below the 8,000-foot contour, hardly enough to supply the entire region" (Pilles 1978:119).

The negative effects of variations in annual rates of precipitation on the indigenous and domesticated fauna is intensified by the fluctuations in temperature which inevitably occur when one is dealing with high elevations. In general, for each 333 meters of elevation change there is a concurrent change of 2.5 °C (Hevly 1988:93-93). These shifts in the average temperature have a significant effect on agriculture in all of the zones but especially in the area above 2,160 meters. In this zone, "the major constraint [on agriculture] is the comparatively short and highly variable growing season" (Sullivan 1984:85). The term "growing season" refers to the period when environmental conditions are favorable enough to permit the germination, maturation, and harvesting of a given domesticated species. For example, corn requires a frost-free period of 90-120 days and at least 20 cm of effective moisture (Hevly et al. 1979). The Flagstaff area's mean number of frost-free days is 110, but this figure is only an average. In historic times, frost-free periods as long as 151 days and as short as 86 days have been recorded (Sullivan 1984). A range such as this is a more significant figure than a mean because the flora must adjust to the worst possible conditions, not the best or the average.

As the figures for temperature and precipitation suggest, agriculture represents an extremely problematic undertaking in the Flagstaff area. In addition to problems in effective
moisture and variations in temperature, the area's soils present a problem to any prospective agriculturalist. Much of the land is hopelessly infertile. Pilles (1978) has found that, out of fifty defined soil types, only six are arable. The rest, for one reason or another are incapable of producing an adequate crop.

In many ways, the prehistoric environment was very similar to what has been described above. The basic lay of the land of the area has not changed at all, and, as a result, the ecology of the region was certainly dominated by similar zonal boundaries. Pollen analysis, dendroclimatological, and dendrochronological studies have proven that the country was beset by the same pattern of high-frequency and low-frequency variations in both temperature and precipitation (Dean and Robinson 1977, Hevly et al. 1979, Bremer 1988). Sometime between A.D. 1000 and 1100 the basic environmental pattern shifted. "The increasing portion of pinyon pine pollen composition in the late 1000 and early 1110 (or as early as 925-975 in other nearby areas) suggest warming temperatures and/or diminished annual effective moisture" (Hevly et al. 1979:501). Dramatic changes in temperature and the amount and distribution of rainfall would occur in fairly rapid succession over the next two hundred years, but these would be overshadowed by the climactic environmental event in Flagstaff-area history—the eruption of Sunset Crater in 1065.

The eruption had a marked effect on the topography of the area and, in turn, on the humans who resided in the region. Cinder cones, lava flows, and basaltic extrusions came to dominate the area, and cinders and ash covered much of the region. These new environmental conditions presented both a
challenge and an opportunity for the Sinagua. They, of course, had to adjust their economic strategies to the new conditions, but, once that was accomplished, they discovered that the volcanic ash had certain properties which made it quite useful. In the first place, "corn would grow better on the cinder fields than on the alluvial slopes of the mountains, the place of earlier fields" (Colton 1960:4). By themselves, the cinders are "a poor medium for agriculture" (Pilles 1979:468). They often lack certain nutrients essential for the successful raising of crops. However, the cinders are loose and quite porous and, as such, make an excellent mulch that will absorb rainfall and snowmelt, assure a steady rate of water absorption, and inhibit the accumulation of standing water which is vulnerable to evaporation (Pilles 1979). When this mulch was spread in a thin layer (25-30 centimeters deep) over arable soils, it increased crop yields on extant fields and opened up new fields, which previously had not had enough water to make agriculture worthwhile. In addition, the cinders are almost exclusively black in color. As such, they are heat absorbent and might "permit growth by artificially lengthening the growing season" (Pilles 1979:468), a crucial consideration at such high altitude.

The improved agricultural conditions resulting from the eruption of Sunset Crater were enhanced, at least for a few decades, by improved ecological conditions. Pilles (1979:468) believes that "there is evidence for a period of above average rainfall between 1050 and 1130, accompanied by a warming trend". These conditions would be very helpful for an agriculturally
oriented society. Hevly et al. (1979) support Pilles' general conclusions in regards to the favorableness of the conditions for agriculture, but they believe that rainfall for this period actually decreased. However, this does not necessarily imply that agricultural conditions worsened. They state that, because what rain there was "was predominantly distributed in the mid- and late summer" (Hevly et al. 1979:504)--which is precisely when the maturing crops require an adequate supply of moisture--the possibility of a successful harvest actually increased during these decades. Whichever hypothesis is accepted, it appears that the ecological conditions in the early post-eruption era were nearly perfect for agriculture. This situation changed rapidly after A.D. 1150. DeBoer (1980:8) suggested that "the onset of a trend towards cool and dry conditions [which] probably made the entire Flagstaff region less suitable for agriculture". Kelley (1971) agrees with this argument. He states that "the optimum conditions interpreted by Hevly as existing in those few decades after the eruption could be described as a short term 'false spring', followed by a cooling trend with shortened growing seasons and a decrease in annual precipitation" (Kelley 1971:51-52). In addition to troubles with rainfall and temperature, the early agriculturalists were soon faced with problems with their cinder-mulched fields. The heavy winds of late spring blew the finer particles of ash off the fields and into large dunes where they were of no use to anyone (Colton 1960). The fields themselves, deprived of their cinder cover, were soon unusable for agriculture. Berlin et al. (1977) have demonstrated that the dual leaching process of free-flowing water and continuous
planting so damaged the Sinagua's fields that even after 700 years they still have not completely regained all of their nutrients.

As the above analysis suggests, the environmental conditions in the Flagstaff area changed greatly over time. The eruption of Sunset Crater and the trend towards cooler temperatures and less precipitation had a marked effect on the peoples living in the area. However, the presentation of this evidence should not be seen as a vote cast in support of the school of environmental causation. It seems to me that to invoke environmental factors as the prime movers in cultural change is overly simplistic. The ecology of a given area does dictate, to a certain extent, a group's strategies, adaptations, and adjustments; but insisting that the environment caused a particular adaptation is naive. I do not wish to imply that the shifts in the ecology of the Flagstaff region were directly responsible for any of the cultural adaptations which the people of the area experimented with. The appearance of the proper amount of rain or of a high enough temperature to permit the cultivation of domestic crops is essential if agriculture is to be practiced by a given people. However, the mere appearance of the optimal conditions does not guarantee that agriculture will be adopted. If archaeologists want to understand a given cultural strategy (agriculture, human sacrifice, the growth of chiefdoms, population aggregation, etc.) then they must focus their attention on the political, economic, and social processes that were occurring in that particular society at that particular point in time. "The weakness of the
environmental explanations is that while they succeed in showing that a population must have been faced with a problem that had to be solved, just why a group chose one solution over another will remain mysterious until social, economic, political, and ideological factors are also considered" (Wilcox 1978:30). Ecological factors must always be kept in mind because of their ability to make any cultural strategy ineffective; but they should be viewed as constraining boundaries, not rigid guidelines. "Limitations as well as the potential of the environment must be viewed always in terms of the intervening variable in the human ecological system, that is, culture" (Binford 1972b:94).
The first people to inhabit the Flagstaff region were very different from the modern Hopi. Archaeologists know very little about these preagricultural peoples. For the most part, their habitation and activity sites are small and ephemeral. Except for stone tools, they produced little which is preserved in the archaeological record. From these tools and other chance finds of well-preserved material, researchers have been able to determine that these people were hunters and gatherers, who travelled in small bands (probably kin groups), and who lived in seasonal shelters and small base-camps (Gilman 1987). These groups were highly mobile. Most movement was almost certainly related in one way or another to the quest for food. Even in good years, crops of such staples as pinyon nuts and juniper berries "are sporadic and exist only in widely separated localities" (Lightfoot 1979:320); and in bad years the people may have had to be constantly on the move in order to avoid exhausting the resources of any one area.
The adoption of agriculture brought about significant changes in the lives of the people of the Flagstaff region. "Procuring, preparing, and eating food crosscuts nearly all other domains of a culture including kinship, economy, law, religion and political organization" (Wetterstrom 1978:87). As a result, when the method of obtaining food, and even the food itself, changes, we can expect concurrent remodeling to occur in the rest of the culture's beliefs and behaviors. All researchers agree that the coming of agriculture triggered far-reaching changes; but there is considerable disagreement in regards to the motives behind the adoption of agriculture, the exact timing of the transition, and nature of the transition (i.e., a sudden shift versus a gradual shift). To put it another way, archaeologists agree that the transition was important, but they do not agree on when, why, and in what manner it happened.

The controversies regarding the date of introduction of maize (which is believed to be the first, and most important, crop) to the Southwest are the easiest of all of these debates to get a hold of. In the 1950s and early 1960s it was fashionable in anthropological circles to suggest that agriculture, in the form of maize, had arrived in the Southwest by 1000 B.C., if not several hundred years earlier. Data was presented from such sites as Bat Cave, the Arroyo Cuervo region, LoDaiSka Cave, and Cienega Creek to support this conclusion. This interpretation has been challenged recently by a new generation of researchers who have gone back and reexcavated some of the sites and reexamined the old data. They have concluded that "Bat Cave and its 'companion sites' individually and collectively comprise a
very weak body of evidence for early maize" (Berry 1985:296-297). The data the earlier generation of scholars used to justify their conclusions has been found to be riddled with problems and inaccuracies. In particular, many of the dates which these scholars used to support their theories have been called into question. These dates were derived almost exclusively from Carbon-14 samples, and most of the samples were collected and analyzed in the period when this form of dating was still in its infancy and when there still existed a great many misconceptions in regards to the proper method of collecting and processing samples. Many of the earliest dates have been found to be flawed because of contaminated or poorly analyzed samples. Even the dates which were obtained from samples collected with due regard to the proper techniques have been challenged. Berry (1985) has suggested that these remaining samples are invalid because their association with the cultural materials they were supposed to place in time was extremely tenuous. This lack of acceptable early dates or reliable early contexts for maize in the Southwest has led Berry to conclude that "maize did not enter the Southwest until a few hundred years B.C." (Berry 1985:304). He believes that, at the earliest, maize cultivation arrived in this part of the continent between 500-700 B.C.

While the timing of the transition seems to be fairly clear-cut, the information archaeologists have regarding the reason for the shift to maize cultivation and the exact nature of the change is certainly open to many interpretations. Anthropologists have proposed two basic theories to explain why the prehistoric
people's of the Southwest adopted horticulture. The first of these theories, and one which has enjoyed a great deal of popularity, cites population pressure as the factor which eventually forced the people to take up agriculture. Under this theory, it is assumed that "a population will tend to keep reproducing and growing in size until an ultimate limit is reached which is determined by the supply of nutrients and energy" (Zubrow 1971:128). A population which has reached the limits of its surrounding system and stopped growing is said to be in a state of equilibrium. However, if the conditions affecting a given people's livelihood should suddenly change for the worse, then the population would be under a good deal of stress. The scholars who support the population pressure theory suggest that it is this stress, brought on by a population which is suddenly much too large for its ecosystem to support, which forced people to find some method of increasing production. This method, they suggest, was agriculture.

Many researchers have challenged the Malthusian assumptions held by the advocates of the population pressure theory. In the first place, it has been noted that population growth is not a preordained event. Hassan argues convincingly for the theory that "population controls were exercised by prehistoric populations" (Hassan 1981:143). He presents both archaeological and ethnographic evidence which strongly suggests that hunter-gatherer groups are well aware of the possibilities and problems inherent in population growth, and will only permit such an expansion if it ties in with their cultural beliefs and values. If it does not, they are able, through a variety of means
(fertility controls, mortality controls, population mobility), to maintain population levels within an acceptable range. Hassan's data suggest that not only is population growth controlled by cultural prescriptions and values, but that, if we are to truly understand the process by which agriculture came to be the dominant subsistence strategy in many areas of the world, we must examine the opinions and assumptions of the people of those regions.

Hassan suggests that pre-agricultural peoples attempt to maintain their population level not at the maximum carrying capacity of the land, as Zubrow has proposed, but rather at what he refers to as an "optimum carrying capacity". The optimum carrying capacity is a boundary line which each culture sets at a slightly different point on the population-to-resources ratio, and which enables the people within that population to avoid "the relative scarcity of choice food items, an increase in the work load per producer, or the need to travel further or schedule [their] subsistence activities differently" (Hassan 1981:170). In other words, stress is not an objective phenomenon. Instead, it is a culturally defined sensation. Each society determines for itself what an acceptable level of stress is, and then leaves itself a buffer against environmental fluctuation such that a change in ecological conditions will not necessarily result in the need for radically new or innovative strategies of production.

Given the above information, I believe that "population pressure cannot be regarded as a sufficient cause of culture
change" (Hassan 1981:163). Population growth occurs within a cultural context and is a symptom of changing cultural values and behaviors. If growth occurs, it occurs because people permit it to happen. If a given group of people permit their population to expand, then scholars must examine their reasons for doing this; and if the same group of people adopts agriculture as a means for coping with the increased demands for a reliable food crop then this innovation must be regarded as something which was inextricably linked with the original decision. They surely knew that an increase in population would have drastic effects on their economic system. They would not make such a commitment without the knowledge that it was possible to feed these new people. After all, why would they want to place themselves and their dependents at risk? Why would they want children they could not provide for? Changes in the demographic make-up of a society do not occur in a vacuum. Invoking population growth as the causal factor in the appearance of agriculture ignores the importance of cultural definitions of what is an optimum population and what is a stressful situation. Yet it is exactly these factors which anthropologists have to account for. It is always easier to invoke arbitrary limits and formulas, but researchers must not ignore the emic perspective or the insights it brings us. "Perhaps the most difficult task [anthropologists] face is that of considering conditions as they must have appeared to hunter-gatherers who were actually in the process of intensifying their food-getting behavior" (Gould 1985:433), but they must not let the difficulty of the task dissuade them from attempting to do just that.
In the place of population pressure as the causal factor in the adoption of agriculture, I suggest that the shift be understood as an opportunistic choice that was made by many different societies at many different times and for many different reasons. It is important to realize that the adoption of agriculture by hunter-gatherers probably did not involve a great increase in knowledge or skills for these people. There was, in all likelihood, no moment of epiphany involved in the transition from foraging to farming. As Cohen has pointed out, "any human group dependent in some degree on plant materials ... will be almost bound to observe the basic processes by which a seed or a shoot becomes a plant" (Cohen 1977:22-23). Not only are they aware of the growth cycle of their local flora, but many groups also engage in behaviors which are almost identical to those used in agricultural societies. "Agriculture is a combination of behaviors", and "all of them have been demonstrated ..., inadvertently, or purposefully, by non-agricultural groups" (Cohen 1977:23). In addition to possessing the experience and talents necessary for the practice of agriculture, many non-agriculturalists have existed side-by-side with farmers from another society for centuries. These people have long been aware of the existence of agriculture as a viable option. "It is therefore not ignorance but rather lack of need that prevents some groups of people from becoming agriculturalists" (Cohen 1977:15). Or, to put it another way, "man did not need education as much as he needed motivation" (Cohen 1977:9).
Given that people were aware of the existence of agriculture and of the basic techniques needed to survive as nascent horticulturalists, and given that human populations are, in general, able to control their rate of growth by various cultural methods, it appears that population pressure could not possibly have caused the widespread adoption of agriculture. People took up agriculture and increased their population because they felt that it was advantageous for them to do so, not because they were coerced into doing so by biological and economic forces beyond their understanding or control. This interpretation is supported by the very nature of the transition in the Southwest. Berry (1985) believes the shift to agriculture as the dominant economic strategy in the region occurred very rapidly. He notes that "there is a rapid, perhaps immediate, increase in the numbers of dated cultural events coincident with the probable inception of maize farming" (Berry 1985:304). Because of this, he believes that "the transition was clearly abrupt and the immediate impact was profound" (Berry 1985:304).

If Berry is correct in asserting that the conversion to agriculture was accomplished rapidly then this would suggest that the population pressure theorists were correct after all. He suggests exactly the same thing they do: that a population under a great deal of demographic stress took up agriculture as a means to relieve some of the burdens they were experiencing. Agriculture, in turn, permitted them to expand their population to an even greater degree, and the whole cycle was repeated again and again. However, Berry's theory has several flaws in it which lead me to believe that the nature of the transition was not
rapid at all, but rather very, very slow. In fact, to speak of a transition is, in all likelihood, a distortion of the events of the past. Only their great distance from that era allows anthropologists to view it as an essentially synchronic incident instead of the diachronic process it must certainly have been. Instead of being a sudden and dramatic happening, "the initial introduction of domesticated plants into the Southwest was a monumental nonevent with little immediate impact on native human populations" (emphasis in the original of Minnis 1985a:310). The main problem with Berry's argument is that he uses his archaeological data uncritically. He assumes that, because anthropologists have evidence for an increase in the number of sites following the definite appearance of maize in the archaeological record, they must be witnessing a population explosion. However, he fails to realize that the methods employed by archaeologists for recognizing sites are "essentially designed for sedentary sites" and "can be applied to nomadic groups only with great care, if, in fact, it can be applied at all" (Cohen 1977:75). This problem is crucial when dealing with the agricultural transition because farming is usually associated with sedentism, and it is these sites which are more likely to be found by archaeologists. The comparatively ephemeral sites of nomadic peoples are often missed entirely. As a result, "we are left with the impression of a population explosion accompanying the development of agriculture, but this may result from nothing more than the preferential preservation and discovery of agricultural villages" (Cohen 1977:76).
The difficulty archaeologists have in recognizing non-agricultural sites is not necessarily reduced with the initial introduction of agriculture. Ford (1985) has suggested that there are many different methods of cultivation: tending, tilling, transplanting, sowing of seeds, domestication, and plant breeding. Most of these strategies, while effective in increasing plant yield, are not visible in the archaeological record. For example, tending, which Ford defines as encouraging growth by weeding or pruning, "is such a casual activity that it leaves no material correlates and the response from the plant is either a quantitative increase in yield or a prolonged presence in a particular locality, neither of which are discernible by archaeological methods" (Ford 1985:4). It is not until people start genetically altering their crops and producing non-biodegradable tools (Ford believes this does not happen until the domestication stage) that we can definitely discern evidence for agricultural activities.

Agriculture, then, may have existed in some modified form well before the "explosion" that Berry cites. For these modified agriculturalists, "agriculture may have represented an efficient and inexpensive buffer against the failure of important naturally available foodstuffs" (Minnis 1985a:316). Limited farming could have been easily incorporated into the social structure of the Archaic societies; and "the location of farming sites and the seasonal timing of cultivation labor requirements probably fit well into already existing patterns of resource exploitation" (Minnis 1985a:337). Farming, then, was an activity which could
provide a more secure food supply, and which, at the same time, fit well into traditional patterns of social organization.

Intensification occurred only slowly, and Minnis (1985a) believes that dependency did not set in until sometime between A.D. 200 and 700. Even at this time, the people of the Southwest continued to rely on gathering and hunting for a large percentage of their food.
Sometime around the birth of Christ semi-sedentary villages emerged in the Southwest (Cordell and Plog 1979). In the Flagstaff area, these small groupings of people probably coalesced a bit later than this, around A.D. 200. By A.D. 500, small villages dotted the landscape around the San Francisco peaks. These settlements are the ancestors of the larger, more complex villages which this investigation is focused on, and, as such, a basic understanding of what life was like for the people who occupied them is important for understanding the future development of Sinagua culture. As I have already suggested, the Sinagua depended on an economic system based on "extensive hunting and gathering buffered by corn for storage" (Cordell and Plog 1979:415). Mobility continued to play a large role in their lives. The early villages are "located in areas from which the resources of two environmental zones could be most easily exploited" (Pilles 1979:463). People moved back and forth between zones easily, and it is even possible that they practiced a bi-seasonal settlement pattern, in which they concentrated their summer activities in the higher areas and spent the winters in the lower, warmer zones (Gilman 1987). Under this system.
fields could be planted in the spring and then tended only sporadically while the people focused their energies on gathering and hunting. The products of the gathering and hunting expeditions and the harvested crops could then be brought to some central location where they could be stored for consumption during the winter months.

While the above patterns seem to be very similar to what has been described as typical for pre-agricultural times, there were several significant technological and social developments during this period. In terms of technology, agricultural tools (hoes, digging implements, etc.) begin to appear in significant numbers during this time. In addition, "investment in the construction of storage facilities increased" (Cordell and Plog 1979:414). As I mentioned above, Gilman (1987) believes that the ability to store food was crucial to the people's ability to maintain a bi-modal settlement pattern. These storage features have two basic forms: pits and ceramic containers. Villages depended on these items to keep their supplies dry and away from rodents and insects. It is hard to determine exactly how numerous these features were. Many have been overlooked in excavations because they are located away from the residential structures, and it is often impossible to determine whether a given ceramic sherd was once part of a storage jar or of some other ceramic object which was not directly connected to storage. However, Colton (1946) has presented a good deal of evidence which suggests that most sites from this period contained several storage pits and a large number of jars. One site, N.A. 1293, contained six storage cysts 2-3 meters in diameter; and another, N.A. 1959, had seven whole
(and an undefined number of broken) ceramic vessels suitable for storing foodstuffs (Colton 1946).

In addition to innovations in production and storage technology, a recognizable style of architecture emerged during this period - the pithouse. There are many different styles of pithouses, and there are recognizable differences between early and late pithouses (see below). However, pithouses are, in general, semi-subterranean dwellings, which are roughly circular, and which were covered of logs, saplings, branches, and daub. Almost without exception, these structures contain a recognizable hearth or firepit, and there are often storage pits in the floor or in the walls. Entrance was gained either by a ladder stretching through a whole in the roof or by a sloped, ramplike entranceway, which invariably faced to the east. Given the amount of work that went into the construction of a pithouse, and the ubiquitous presence of household artifacts and hearths, it has been assumed that these structures functioned as houses, at least for part of the year.

The other type of structure which has been attributed to this time period (and which was used throughout the prehistoric era) is the fieldhouse. In general, a fieldhouse was a very ephemeral structure. It usually consisted of a basal course of rocks (which is all we find now), topped by a brush superstructure. Structures very similar to this are still being used by modern Pueblo societies (Ellis 1978). There is some evidence which suggests that various types of household activities took place in the fieldhouses (e.g., flintknapping,
processing food), but the variety of behaviors attributed to the fieldhouses never approaches that found in pithouses (Pilles 1978). This evidence has led researchers to conclude that fieldhouses were occupied only seasonally, and that their main function was to provide people with shelter while they exploited areas and/or agricultural fields which were removed from their pithouses. In addition to the above evidence, Pilles (1978:122) found that only six out of thirty-two fieldhouses had "fire features", and Ward (1978) found no indication of the prolonged storage of food at his fieldhouse site. Both of these facts strongly suggest that fieldhouses were utilized only seasonally, and that they functioned as a way to funnel different types of food back into the main settlement for storage and eventual consumption.

During this time period the general settlement pattern "appears to have been suited to a diversified subsistence pattern, with locations of base camps representing a compromise among demands for access to varied resources" (Matson and Lipe 1978:5). In many ways this pattern is very similar to that which must have existed before the beginnings of agriculture. However, along with new technologies and architectural styles came a change in the basic structure of the population. Larger and more permanent groupings of people began to appear on the landscape. Families were no longer living solely in isolated pithouses. More and more people had gathered together into multi-family groups. Wilcox (1986) has divided these three new settlement into several categories. He suggests that: a grouping of 4-6 pithouses be called a "large farmstead"; a grouping of 1-3
pithouses be called a "small farmstead"; and we should maintain the category of fieldhouse and/or artifact scatter for the smallest of sites (Wilcox 1986:112). In addition he believes that, eventually, we will be able to find groupings of 9-15 pithouses, which he proposes to call a "hamlet". Colton (1946) has demonstrated that there were many sites from the first three categories in the Flagstaff area during this time. Hamlets seem to appear somewhat later in time, but they are definitely in existence by A.D. 1000, and they may have appeared several hundred years earlier. Wilcox's classifications seem to me to be quite useful. They provide a meaningful method of categorizing the behavioral and social patterns of this time. I will make use of these terms throughout the paper.

Within the new settlements themselves, much remained the same in people's everyday lives. Diversity remained the cornerstone of their economic strategy. Farmsteads tended to be located near agricultural fields (Pilles 1979), but hunting (Colton 1946) and gathering (Hevly et al. 1979) retained their importance. In addition, the production of ceramics and stone tools continued to consume much of their time. However, the appearance of larger groups of people permitted several changes to occur in the patterns of their economic activities. Communal projects (on a small scale) were possible for the first time, and people were able to rely on their neighbors for assistance in times of trouble. The reciprocal exchange of food and other goods was a viable alternative now that people lived closer together. This increase in inter-personal contact provided the
Sinagua with an additional buffer against environmental catastrophe. "In an egalitarian society living in an effective environment with unpredictable and potentially disastrous fluctuations of biotic and abiotic variables, reciprocity and ritual will regulate the circulation of nutrients for the survival of the human populations" (Ford 1972:3).

There is some evidence that the development of more complex intra-village relationships was paralleled by the emergence of a system of slightly more rigid inter-village relations. Pilles believes that "the distribution and nature of sites suggests that there was some sort of community organization" during this period (Pilles 1979:463). The larger pithouse villages became, he believes, "important centers" for inter-community ritual and, possibly, trade. He notes that the larger sites tend to be located centrally between smaller sites, and that these sites seem to have been located where they would be able to control much of the area's prime farmland. Smaller farmsteads tend to be located further away from arable land. In addition, "large pre-eruptive structures apparently associated with ceremonial and intercommunity activities have been identified" (Pilles 1979:461); and these are consistently located in close proximity to the larger farmsteads. Pilles believes that we can recognize communities of sites, which are bounded by "natural geographical features such as washes or ridge lines" (Pilles 1979: 463). This interpretation has been supported by Wilcox (1986), who has noted that, while the Sinagua may have changed the location of their sites fairly frequently, they tended to do so within a very limited range (1-3 km).
Within a given region, then, there may have been several of these small inter-village organizations. Within a given community, the farmsteads would have been linked by marriage (exogamy would be required in such small villages), ritual, and trade. Exactly how complex the Sinagua inter-community social structure was during this early period is still, to my mind, very much an open question. Lightfoot and Feinman, although concentrating on an area well to the south and east of the Flagstaff area, believe "social differentiation and specialized decision making were present in parts of the Southwest by at least A.D. 600" (Lightfoot and Feinman 1982:80). While this may or not be true for the Mogollon region (Schiffer, 1983, argues convincingly that Lightfoot and Feinman misrepresented their data), it seems to place too great an emphasis on the rise of an elite class to conform to the information that is available for the Flagstaff area. Crumley (1979) suggests that researchers should not view the possibilities as being polar opposites: ranked vs. unranked. Rather, she suggests that they should emphasize the range of possibilities available between these two end-markers. Granted, there will always be a hierarchical pole, in which some elements in a system are subordinate to others; but, she suggests, researchers will be hard pressed to find a truly unranked society. Instead, she believes they should emphasize the "heterarchical" nature of many societies. Within a heterarchical system, "each element possesses the potential of being unranked ... or ranked in a number of ways, depending on systemic requirements" (Crumley 1979:144). This seems to me to
be an excellent way to describe the Sinagua's early social structure. There was certainly some ranking going on, but what there was of it was not overly rigid. A loose system of stratification between settlements could certainly exist without necessitating the emergence of a recognized class of elites. Hohmann's (1982) work on pre-eruptive mortuary data supports the conclusion that there was little or no social differentiation among the Sinagua at this time.

What has been presented in the last few pages should be seen as nothing more than a general cultural history of the Flagstaff region in the years before the eruption of Sunset Crater. I have made little effort to place this information in a strict temporal context or to describe the changes that took place in this system between A.D. 1 and the eruption. Instead I have attempted to provide some background information on this area and its early inhabitants. I will now supply a temporal context for some of the developments I have been discussing.

Archaeologists in the Southwest have, almost from the beginnings of excavations in the area, attempted to place the cultures that they have examined onto a time-line. Once the researchers have the beginning and end points, they have attempted to divide the time-line into neat little blocks of time, which, they believe, correspond to recognizable episodes in that culture's development. Each segment is called a phase or a focus. So, for example, in the case of the Anasazi, the previous generation of archaeologists were confronted with the terms Basketmaker I, Basketmaker II, Basketmaker III, Pueblo I, Pueblo II, Pueblo III, and Pueblo IV, each referring to a certain period
of time and, presumably, to a certain stage in that culture's development. The Flagstaff area is no different from the rest of the Southwest in this respect. The phases, as they are currently defined, in the Flagstaff area are: Cinder Park (A.D. 600-700), Sunset (700-900), Rio de Flag (900-1065), Angell-Winona (1065-1110), Padre (1110-1150), Elden (1150-1300), and Turkey Hill (1300-1400). These phase names are used throughout this paper.

Harold Colton did the original work in setting up the phase designations (although he referred to them as foci). He believed that it was possible to define phases by making a "combined study of tree-rings from the beam material and pottery from the site" (Colton 1946:258). He recognized that ceramics vary widely in terms of color, design elements, firing technique, types of temper used, etc. By coordinating the changes in ceramic manufacture with absolute dendrochronologic dates, he believed that he could define the phases. Other variations in cultural objects (houses, hearths, projectile points, etc.) could then be plugged into the proposed phase designations, and, in this way, he could form a relatively accurate picture of when changes occurred in the Sinagua culture. Once this process was completed, any Sinagua site which contained the proper material elements could be "confidently" classified as belonging to a particular phase. Colton's classifications have worked fairly well over time. They have aided archaeologists in establishing chronologies and inter-site relationships, and, for this reason, I will make use of them in this paper. However, it is important to recognize that there are some serious problems inherent
in using these terms. In the first place, "the concept of 200-year-long stages tends to have nearly sacred status in the Southwest" (Plog 1983:292). Archaeologists have taken the idea of a phase and reified it. Instead of trying to determine if the phase designations match the data, many people have assumed that the categories are correct and have attempted to shoe-horn the data into them. As a result, a site which has slightly more Cinder Park phase sherds than Sunset phase sherds will be classified as a Cinder Park phase site, and it will be assumed to have all the attributes of a site of that phase, even if those characteristics are not readily apparent.

In addition to making it easy to mis-interpret or under-analyze data, the phase classifications "are typically arbitrary temporal concepts which obscure the diachronic variability inherent in the archaeological record" (Plog 1975:98). Change is recognized to have occurred between phases, but tends to be obscured or ignored if it happens to occur within a given phase. Phases are normative constructions and, as such, tend to diminish our capacity to recognize and explain variability (Upham 1984). This is tragic. Archaeologists must concern themselves with the changes that are only visible over a great stretch of time. Phases prevent this by setting up a situation in which variation "within categories is slight, while variability between categories is substantial" (Plog 1974:44).

In this paper I concentrate on cultural behaviors and variables "that must be measured continuously, not categorically" (Plog 1983:294). It makes no sense to try to explain differences in social structure and group size in terms of differences
between arbitrary segments of time. If these variables are to be understood, then they must be traced continuously through time, not analyzed in four or five discrete sections. Much of this chapter has been, and the rest of the paper will be, concerned with doing just that. However, because this section is intended to serve only as background information, I will use phase designations to provide a temporal context for the information that has been discussed above.

Cinder Park phase sites are made up exclusively of pithouses and fieldhouses. For the most part, the sites consist of either isolated pithouses or clusters of 2-3 structures (McCormack n.d.). The pithouse floors tend to be found about 75 centimeters below the original (i.e., prehistoric) ground level. They were typically round or rectangular with rounded corners, and they tended to be fairly large. Pithouses from this phase have long sloping entrances on the east side, timber-lined walls, a roof of poles and mud, and a central fire pit. The dominant ceramic type on these sites is Alameda Brown Ware (Colton 1946). As is the case for all of the pre-eruption phases, information on Cinder Park sites is hard to come by. Few sites have been located, and even fewer fully excavated. Colton believes that, because of the cinder cover, "the sites are hard to find, but they are probably more abundant than the number catalogued in the [surveys] indicates" (Colton 1946:247). Along a similar line, Wilcox (personal communication) has noted that, even after a site is found, it is often very difficult to determine the exact number of structures present. Given this, he believes that it is
probably a good idea to assume that the actual number of pithouses in a given site is at least twice as great as the original survey data suggested.

The change in material culture which marks the transition from the Cinder Park phase to the Sunset phase is not very dramatic. There is a shift in the dominant ceramic type and a four-post support system came into use in many pithouses, but besides these slight modifications there was very little in the way of major transformations. The settlement pattern seems to have remained basically the same (McCormack n.d.), and the pithouses retained their timber linings, central fire pits, and sloping entranceways (Colton 1946). What changes there were in the Flagstaff area before 1066 occurred in the Rio de Flag phase. Although Pilles (1979:460-461) has stated that the Rio de Flag, Sunset, and Cinder Park phases "appear to have been fairly uniform relative to ceramics, architectural styles, settlement plans, and subsistence strategies", I believe that the years 900 to 1065 witnessed several marked breaks with past traditions. The changes may not seem dramatic, but they were the forerunners of events which will be the focus of the next chapter and so must be discussed.

In the first place there seems to have been, Pilles's argument notwithstanding, a transformation in settlement patterns during this phase. Pilles himself (1979:463) acknowledges that there was a discernible change in both the elevations and the locations that were occupied by the Sinagua during this time. Warmer, drier conditions made the upper elevations, with their better rainfall and slightly cooler temperatures, seem more
attractive to the Sinagua; and many people relocated to the flanks of Mount Elden and the San Francisco Peaks. The pattern of settlement for these areas was very similar to what has already described for the Cinder Park and Sunset phases, with farmsteads containing 1 or 2 pithouses dominating the landscape. However, there seems to have been a larger number of pithouse villages. "Isolated pithouse residences are scattered among the larger habitation sites which have two to six structures each" (Madsen 1982:13). Fieldhouses and artifact scatters dating to this phase are common. In addition to the increase in the number of small villages present in the area, the Rio de Flag phase also witnessed the introduction of several previously unknown architectural styles. The deep timber-lined pithouse remained the most common structure, and it retained its four post support system and central fire pit; but the sloping entranceway to the east was replaced by a ventilator shaft. Entrance was now gained by climbing down a ladder from a hole in the roof. In addition, the Sinagua no longer lived solely in pithouses. To the south of the peaks, platform houses appeared in areas which tended to become boggy in the spring. These structures take their name from the fact that they were constructed on raised (20-30 centimeters) mounds. They were made of timber, brush, and mud, with a basal course of stones. Many of these structures have an "alcove" on the south side. The final architectural innovation of the period was the emergence of surface rectangular granaries with low masonry walls (Colton 1946). These may have existed in earlier phases, but they are first found in significant numbers
during the Rio de Flag period.

Besides the beginnings of a new settlement pattern and the emergence of several new architectural styles, this period also witnessed the appearance of recognizable ceremonial architecture. The most notable type of ceremonial structure that appeared during the Rio de Flag phase was the ball court. The ball courts which are found in the Flagstaff area are very similar to those which have been described for the Hohokam culture in the Salt River Valley. Little is known about the game that was played in them, but it is assumed to have had a socio-ceremonial significance for both the participants and the spectators. The location of these courts is often in the center of a scattered group of pithouses, suggesting that they may have served as a focal point for social and religious activities for a region (Madsen 1982). In addition, a meeting place such as this may have been used by the locals to exchange or redistribute certain goods and services. By using the courts in this way, the Sinagua could have broadened their resource base and reduced the risk of famine. The interdependence that would emerge from such a practice would serve to tie the people involved to each other. Glassow (1977:206) believes that what aggregation there was during this period "arose as a result of the economic interdependence between householders (and larger social segments)", and that this interdependence may have been attractive to the people because of "the variability of crop yields from year to year".

Ball courts were not the only ceremonial structures present during this phase. Community rooms and kivas have also been
attributed to this period of Sinagua prehistory. Structures such as these have been found in earlier contexts (Pilles [1979:461] refers to a Cinder Park phase Great Kiva that is 8.5 meters in diameter), but they may become more numerous during the Rio de Flag phase. It is hard to determine if these structures served any integrative purpose during this phase because they "are found at both small and large sites and on occasion as isolated structures" (Madsen 1982:15). Part of this confusion certainly stems from the difficulty inherent in attempting to define a structure as a "community room" or a "kiva". There are no hard and fast definitions for determining whether a researcher has an unusually large pithouse or a kiva on his/her hands; and, as a result, archaeologists have surely labelled some pithouses as ceremonial rooms and some ceremonial rooms as pithouses. However, even though the data base has its problems, it does seem to confirm the pattern, noted above, of sites clustering around slightly larger sites or ball courts. The location of both the ball courts and the community rooms/kivas, and their relation to neighboring sites, gives me the impression that the household units were "organized around centers with community architecture" (Fish, Pilless, and Fish, quoted in Madsen 1982:13). What inter-community organization there was during this phase was certainly very loose, and I do not wish to imply that the Sinagua of this period were controlled by a centralized hierarchy of elites, or even by overly powerful chiefs. However, the available evidence does suggest that the Rio de Flag phase did witness the beginnings of some sort of community organization; and it may
well be that this nascent intra-regional system was the forebears of the more complex systems that will be the focus of chapter four.
CHAPTER 4

Flagstaff Area, A.D. 1066-1110

Sunset Crater erupted in 1065 and, although "subsequent events ... occurred episodically from about A.D. 1150 to 1250" (Wilcox 1986:94), it was this event which essentially created the Flagstaff area as it is today. The appearance of cinder fields, lava flows, and basaltic extrusions presented the Sinagua with both problems and opportunities. What is striking about their adaptation, however, is not that the eruption of Sunset Crater ushered in a new era in Sinagua culture, but rather that their style of living remained remarkably similar to that which had existed in pre-eruption times. The period spanning the years 1066-1110 (which incorporates all of the Angell-Winona phase and the first half of the Padre phase) should be seen as a time of relative stability. There were some changes, to be sure, and I will address these below; but, in general, "the traditional allocation of work space and living arrangements dating from the Rio de Flag phase were maintained in the [Angell-Winona phase], only to be significantly transformed in the Padre phase" (Wilcox
The settlement pattern in the Flagstaff area changed slightly during this time period, although much of this change is in line with the patterns observed in the Rio de Flag phase. As in the previous phase, isolated pithouses became less and less frequent, and their place was increasingly taken by pithouse villages containing 2-6 structures. However, the interrelationships between the different villages seem to have been changing during this time period. "The relative location of villages of two to six pithouses appears to have been more aggregated than in previous phases" (Madsen 1982:17). A good example of this trend towards increased inter-farmstead interaction is the Winona site, which contains at least two (Madsen 1982), and possibly as many as four (Wilcox 1986), clusters of pithouses datable to this phase. Each separate cluster contains from one to four pithouses. These clusters are all within a kilometer of the Winona ballcourt, which was constructed during this phase (Wilcox 1986). In addition to these pithouse villages, "pueblo-like structures with two to four rooms have been recorded for this phase" (Madsen 1982:17). These appear relatively late in the sequence and, in all likelihood, were not a major factor in the lives of the Sinagua during this period. Finally, both DeBoer (1980) and Madsen have documented "a tremendous increase in field houses" during this period (Madsen 1982:18). These fieldhouses are often near larger settlements and Wilcox (1986) has suggested that these hamlets may have exercised social and political control over these spatially associated fieldhouses and farmsteads. "A hamlet-
farmstead—temporary camp association may have partitioned the neighborhood into a contiguous series of territories"), each of which was a separate social and political entity; and "each of which encompassed a maximum amount of biological diversity" (Wilcox 1986:112).

The locations of these sites also underwent a change during this time. In general, there was an expansion into areas in the pinyon—juniper zone below 2070 meters. The areas above 2070 meters were still used, but less intensively (Madsen 1982). Climatic conditions (DeBoer 1980) made the lower areas seem more attractive, and the sudden appearance of thousands of acres of cinder fields increased the allure of those areas. However, it is important not to over-estimate the influence the volcanic ash had on the Sinaguan settlement pattern. While the Sinagua did settle in areas which were near or on cinder fields, it is quite possible that the cinders were less important to them than were the presence of "washes and the availability of arable land" (Pilles 1979:469). Madsen (1982) has found that habitation sites tend to be distributed along the edges of open basins and small washes. This conclusion is supported by Wood's data from the Little Colorado area. He found that 100% of all habitation sites and 91.7% of all limited activity sites occur within one kilometer of arable land (Wood 1978:156). This suggests that fieldhouses tended to have agricultural functions during this period, although Catlin's data (1986) from the Black Mesa region does not fit this pattern.

As the above data suggest, agriculture probably became
increasingly important in the Sinagua's subsistence strategies after the eruption. The Sinagua's settlement pattern is very similar to "the diversified settlement strategies that frequently accompany the conduct of agriculture in marginal environmental settings" (Sullivan 1984:96). Mobility remained quite important to the Sinagua. The presence of a large number of fieldhouses "may indicate a rapid change in the selection of areas for cultivation" (Pilles 1969:101). Certain settlements remained in one place of course, but, while "the ecological niche of hamlets was quite stable, ... farmsteads and temporary camp locations apparently shifted to cope with changes in the length of the growing season" (Wilcox 1986:112) and decreasing soil fertility. The frequent movement of the smaller sites would also have increased the efficiency of the Sinagua's efforts at hunting and gathering. We know from pollen studies (Hevly et al. 1979) that gathered materials remained an important part of their subsistence strategy during this time. The fieldhouses must certainly have facilitated the collection and processing of wild resources, both within a given zone and between several zones.

The basic unit of social organization during this time period was almost certainly a domestic group composed of members of an extended family. "A domestic group is behaviorally defined as a minimal, localized residential group principally responsible for performing its own subsistence and maintenance activities" (DeGarmo 1977:158). The family organized its activities around the growing season, of which the principal events were the planting and the harvest. As Bronitsky notes for the pueblo of Arroyo Hondo, "agriculture was becoming sufficiently important
through time to necessitate rescheduling of other activities to times of nonagriculture activity" (Bronitsky 1979:227). Limited hunting and gathering may have occurred in conjunction with everyday agricultural tasks, and more ambitious expeditions may have been undertaken during the late fall and winter. The production of tools was almost certainly a wintertime activity, as is the case in modern pueblos.

In smaller settlements there was probably little in the way of an authority figure or organized social structure above the level of the individual family. In the hamlets, however, there may have been a slightly more complex system of organization. Hohmann (1982) believes that these hamlets were divided along lines very similar to moieties. He cites two pieces of evidence as support for this conclusion. In the first place, he notes (Hohmann 1982:39) that the large Angel-Winona phase and early Padre phase sites often contain two large "community rooms", one on the east side of the settlement and one on the west. Secondly, Hohmann has found that the Sinagua of this period practiced two different methods of burial: cremation and inhumation. These differences in burial practices do not, he believes, represent differences in rank or status because the grave goods associated with the two styles are almost identical. They may, however, reflect moiety preference. Hohmann's data indicates that cremations and inhumations are found in almost equal numbers, and that cremations tend to occur on the east side of sites, while inhumations are usually found on the west. This division parallels the placement of the community rooms. While
Hohmann's data is admittedly inconclusive, it does suggest that there were recognizable spatial and mortuary divisions within the larger Sinaguan communities. This, in turn, may indicate the existence of a moiety-like system of social organization.

The appearance of moiety-like divisions in the larger communities was probably accompanied by changes in the sociopolitical organization of these settlements. Hohmann (1982) believes that this period in the Sinaguan cultural sequence witnessed an increase in social differentiation. The mortuary data he presents from this period suggests that the hamlets contained several individuals who were accorded a significantly higher status than were their contemporaries. These individuals' graves required more energy to construct, and their grave offerings were more elaborate than those of their peers. However, the mere appearance of social differentiation does not necessarily imply that these communities were highly stratified. Differentiation, Hohmann notes, "indicates differences but not specific, structured social divisions, whereas stratification ... implies a highly structured system" (Hohmann 1982:12). The fact that all known examples of high-status burials are those of elderly men, and that 75% of all of the offerings in these burials are believed to be religious objects, suggests that the Sinaguan system of this time was based on achieved, rather than ascribed, status (Hohmann 1982). The system was not highly stratified, and a high position within the community was something which was earned, rather than being the birth-right of a particular family or individual. The men who Hohmann identifies as high-status individuals were probably essentially
"religious leaders" (Hohmann 1982:42), who were the spiritual
descendants of the religious practitioners of earlier phases, and
whose secular powers were extremely limited.

According to Hohmann, "The Angel-Winona phase Sinagua
practiced a limited stratified form of social organization ... where elder males could attain high status through an achieved
ranking system" (Hohmann 1982:45). This system held sway in this
area until the latter half of the Padre phase. The men who were
able to attain a high status in their own hamlet probably played
a role in integrating the neighboring settlements into a cohesive
social and economic system. I have already discussed the idea
that smaller farmsteads and fieldhouses seem to have been part of
a larger settlement system focused on a large farmstead or a
hamlet. The hamlet may have provided the outlying settlements
with religious and social services, and in this the religious
elites of the larger communities would have led the way. It is
even possible, although I have seen no evidence for it, that the
inhabitants of the smaller settlements were incorporated into
their hamlet's moiety system. In addition to these local ties
between settlements, it is quite likely that the settlement
systems themselves were tied together by socio-religious and
economic connections in which the elites may have led the way.
The ball court remained a major feature in Sinagua culture during
this period. At least six courts were in use during this phase
(Kelley 1963, Madsen 1982, Stanislawski 1963, Colton 1946), and
there may have been several more. The possible functions a ball
court may serve for a local settlement system have already been
discussed. It is enough for me to note here that the courts "probably contributed to intra- and inter-village social and religious integration" (Stanislawski 1963:524) by providing the Sinagua with a place where they could conduct religious, social, economic, or political business. Interestingly, Kelley (1963:110) presents evidence that the courts of this time may themselves have been grouped into two distinct clusters, each containing three courts. Within the cluster, the ball courts are only 10-15 kilometers from each other; but the clusters themselves are 60 kilometers apart. This may suggest a slightly more advanced form of inter-village organization, but more data are needed before this can confidently be claimed. In addition to the ball courts, the community rooms that Hohmann cited may have provided a place for inter-village meetings or rituals; and inter-village exchange, on a formal or informal level, may have brought the people of different settlement systems together on a fairly regular basis. The level of integration between settlements was probably greater during this period than it had ever been, but this should not be read to mean that the Sinagua were a highly organized society at this time. The loose pattern which characterized their intra-settlement relationships extended to their inter-regional associations.
Flagstaff Area, A.D. 1110-1150: Time of Changes

The forty-year period between A.D. 1110 and 1150 marks the end of the Sinagua's pre-eruption way of life. Their earlier lifestyle had, of course, undergone some modification following the eruption of Sunset Crater, but it is in the late Padre and early Elden phases that the pace of change accelerated dramatically. By 1150, their social, economic, and political systems were radically different from what had existed only two hundred years before.

The patterns of change in the Sinaguan settlement system that were described earlier were carried into this time period. Site densities continued to increase. Where the maximum number of sites per square mile had once been 25, it now climbed as high as 40 (Madsen 1982). The nature of these sites changed as well. Field houses and artifact scatters remained numerous (DeBoer 1980); but the "small pithouse tradition began to decline and in many instances was replaced by sites that had both pithouses and pueblos" (Madsen 1982:20). These sites tended to be a good deal larger than the smaller hamlets and villages that I discussed in the previous section; and the increased presence of above ground masonry room-blocks suggests that the Sinagua were not only living in larger groups but in much more centralized villages as well. A site such as AR-03-04-02-1777 (Madsen 1982), which has
thirteen pithouses and seventeen pueblo-like rooms, typifies this new style of village organization.

These sites continued to be located at lower elevations than their pre-eruption ancestors (McCormack n.d.). During this time period "climatic conditions [in the lower zones] were nearly optimal for the Sinagua" (Madsen 1982:18). A combination of increased rainfall and lowered temperatures made these areas seem attractive to the Sinaguan agriculturalists. The higher areas around the base of the peaks may have been too wet for farming (Pilles 1979), but they were never completely abandoned. However, the vast majority of the sites above 2070 kilometers which date to this phase are fieldhouses, suggesting that the upper zones were used only seasonally, perhaps as a buffer against short-term fluctuations in temperature and rainfall. By 1150, "the majority of Sinagua appear to have settled at lower elevations where improved soil and moisture conditions and a longer growing season were advantageous to farming" (Madsen 1982:19).

The subsistence strategies of the Sinagua were also changing during this period. Hunting and gathering remained an important part of their economic system, as the fieldhouses in the upper zones and various pollen samples attest (Hevly et al. 1979). Despite this, however, agricultural products had assumed a much larger role in the diet by the end of this period. In many ways, this simply represents a continuation of the trends that I noted in earlier sections. Sites continued to be located in favorable areas for agriculture, and fieldhouses seem to have
been used to bring isolated pockets of soil into production. However, there are signs that what we are seeing here is not simply a continuation of traditional farming patterns, but rather the beginnings of agricultural intensification. Although good data are scarce, it appears that the Sinagua were investing more time and effort in their fields. Hohmann (1982) believes that the complexity of their field systems increased during this period, and Colton (1946) notes that, while hoes have been found in all phases, they seem to be more common in post-eruption time periods. In addition, it seems that sandstone hoes began to replace basaltic ones at about this time. These new hoes may represent an attempt to increase the overall crop yield. More information must be gathered before it is possible to reach any conclusions on this question, but the data I do have seems to suggest that the Sinaguan people of this time were involved in "an intensification in agricultural subsistence systems" (Hohmann 1982:50). Bronitsky (1979) has described a similar pattern for the Rio Grande pueblo of Arroyo Hondo.

The changes that have been described in settlement patterns and subsistence strategies suggest that there were also significant shifts in Sinagua social organization at this time. Although there were not yet nucleated villages in the classic sense of the term (Wilcox 1986), intra-settlement relations must have been more complicated in this period than they ever were before. As a village grew in size, the social demands placed on every inhabitant of the community would increase. A village with thirty or more rooms or structures would contain upwards of ten different families. Each family, and each family member, would
be expected to interact with the other people in the village in culturally sanctioned ways. No longer would an individual only interact with his or her immediate family. The web of daily social interactions would now include distant relatives, friends, acquaintances, fellow moiety members, etc. Social roles would become more complex and day-to-day activities would have to be structured to take into account these changes. Patterns of work almost certainly began to shift from individuals laboring alone to groups of people working in concert on projects large (building field systems, maintaining community structures) and small (grinding corn, tool production). Even the family structure may have begun to change with the addition of new categories of relatives to people’s everyday lives.

There is some evidence that these changes in the number and nature of social roles were accompanied by a decline in egalitarianism in the larger communities during the latter part of this period. From his analysis of Sinaguan burial patterns, Hohmann (1982) has concluded that pre-Padre phase burials were remarkably homogeneous (with the exceptions discussed above). However, he notes that there is “a breakdown of homogeneity of burial treatment toward the terminus of the Padre phase and into the early Elden phase” (Hohmann 1982:41). He sees the presence of an increased number of “elite” burials as proof that the Sinaguan society was moving away from a system resembling a loosely structured chiefdom and towards a more complex, hierarchical structure.

Hohmann also notes that, during this time period, there is a
marked rise in the volume of inter-village, and even inter-regional, exchange (Hohmann 1982:47). He suggests that this may imply a tightening of the bonds between villages, perhaps at the behest of the "elites" who, he believes, stand to gain the most from such a development. At least in regard to what have traditionally been considered ceremonial structures, the evidence seems to support Hohmann's theory. Wilcox has stated that in the early 1100s "hamlets in the Flagstaff area were integrated in a ball court network that extended at least to the Verde Valley" (Wilcox 1986:112); and Madsen (1982) mentions that compounds, kiva-like pithouses, community rooms, and dance plazas are often found at sites dating from this period. These structures would have served not only the integrate the villages in which they appeared but also provided a place where people from outside the immediate community could gather to exchange goods or information. Hohmann believes that it was this coming together at the larger sites which created the beginnings of a redistributive economy, in which the hamlets served as the loci into which goods were brought and then redistributed to the smaller sites. He refers to this as a "network" which connected "the large trade and redistribution centers" with the smaller villages (Hohmann 1982:47).

While we agree with Hohmann that increased inter-village integration characterized this period, his theory that a redistributive economy emerged seems a bit extreme. Earle (1977) has argued persuasively for the idea that any system can be called a redistributive economy, but that, within this concept, there are many different levels of meaning. The first, and most
common, of these is "householding", which he defines as "the pooling and general consumption of goods produced under the division of labor characteristic of the domestic unit" (Earle 1977:215). Secondly, he notes that many cultures practice "share-out", defined as "the allocation of goods produced by cooperative labor to participants and the owners of the factors of production" (Earle 1977:215). Finally, there is "mobilization", which he defines as "the recruitment of goods and services for the benefit of a group not coterminous with the contributing members" (Earle 1977:215). All of these levels are examples of redistribution, and all are found in social institutions with some form of centralized leadership. However, each of these institutions organizes or mobilizes a different level of society--household, community, inter-community--and each requires a different type of leader. Hohmann's argument confuses these different planes of action. The Sinagua almost certainly had a redistributive economy within the individual household, and perhaps even on a community level, but it is highly doubtful that such a system operated at the inter-community level at this time. Hohmann was not entirely wrong in asserting the centrality of the hamlets in the local system; but it makes more sense to me to view the exchange that took place at this level as some form of balanced reciprocity between neighbors who wanted to maintain cordial social, religious, and economic relationships (Irwin-Williams 1977). A more complex system may have emerged later (see below), but the data indicates that such a system was not present during the late Padre and early Elden phases.
Flagstaff Area, A.D. 1150-1300: The Elden Phase

The period I have designated as the Elden phase is usually considered to have been the highlight of Sinagua cultural development. It is during this era that the trends towards political centralization, social stratification, and economic intensification that this paper has been chronicling reached their conclusion. By the second half of the thirteenth century (in what is often referred to as the Turkey Hill phase), the Flagstaff area was being slowly abandoned, and the Sinagua were beginning to disappear as a recognizable cultural entity. To be sure, several large pueblos remained in the area for another hundred years, but the nature of the sociocultural landscape had changed dramatically by then. The customs, behaviors, and institutions that emerged during the Elden phase did not survive long but, during their heyday, they formed the basis for a society that was surprisingly complex.

Harold Colton believes that the period A.D. 1150-1200 witnessed the culmination of the Sinagua's population explosion. "Suddenly, within a single century, the population more than quadrupled, and again, in the succeeding 75 years, doubled again, making a total, about A.D. 1160, of almost ten times as many people in the area as had been living there less than two hundred
years earlier" (Colton 1960:104). Pilles (1979) believes that Colton has greatly exaggerated the amount of demographic change that took place. Instead, he argues for a 19% increase in population in the post-eruption years. Whatever the exact figure, there is every reason to believe (Wilcox 1986) that "the Sinagua population reached its maximum size ... during the late twelfth century" (DeBoer 1980:119).

The exact cause of this growth is still unknown. I have already stated (Chapter 3) that it is incorrect to assume that population growth is caused by mysterious biological or ecological "forces" against which humans are defenseless.Instead, I have argued that, to the extent that it occurred, population growth is "purposely induced, or at least consciously tolerated" (Dumond 1972:291). I believe that people make relatively reasoned decisions regarding family and community growth which involve a balance among three basic components or factors: "the satisfaction of material wants, the satisfaction of affective relationships (including purely symbolic ones, as with Gods), and the expenditure of least effort" (Dumond 1972:288). The demographic expansion that occurred in the Flagstaff area after the eruption of Sunset Crater should be evaluated in these terms. Although the exact cause for the growth is still undetermined, it seems reasonable to expect that it was, in some way, linked to the improved economic conditions that followed in the wake of the eruption. Dumond (1972:286) believes that "population growth and the expansion of subsistence techniques are interrelated"; and Zubrow has taken this a step farther by stating that "fertility is a direct function of the demand for
labor and the family's demand for capital" (Zubrow 1976a:14). While I do not support the rigid economic determinism that seems to be embodied in these theories, I do believe that economic factors are important in determining the nature and timing of episodes of population growth. In the Flagstaff area, it seems reasonable to assume that the improved environmental conditions (increased precipitation, higher temperatures, better water retention on arable land) of the late eleventh and early twelfth centuries would have created a favorable context for population growth. Families and communities may have desired more children to provide workers to exploit the improved conditions, or the conditions may have created a sense of security about their ability to provide for a larger population base. Whatever the reason, it seems likely that the improved environmental conditions played a role in influencing people to have more children.

Internal factors alone may not be enough to account for the Sinagua's population increases. It is also possible that the Flagstaff area may have received an influx of people from the western part of the region in about 1150. Wilcox (1986:116) has suggested that the Cohonina people (who he believes were actually a western branch of the Sinagua and not a separate culture) abandoned their homeland on the Coconino Plateaus and in the Upper Deadman's Creek area, and emigrated to the San Francisco Mountain area. Although Pilles (1979:474) believes that "a strong case for Cohonina influence of post-eruptive Sinagua cannot be made" and that the evidence for their presence in the
area is limited to the high frequency of their distinctive San Francisco Mountain Grey Ware, it seems likely that this small-scale immigration could have accounted for at least some of the recognized population increase.

Interestingly, the demographic increase was not paralleled by an increase in the number of sites in area. In a study of the Turkey Hill area (Madsen 1982), it was discovered that the population of the region had aggregated into fewer than twenty villages, and that a 2.5 square mile area around Elden Mountain contained only six villages. All-in-all, "the site density in the study area is significantly lower during the Elden Phase" (Madsen 1982:23). Field houses remain numerous (Madsen 1982, McCormack n.d.), but, despite this, site size in general seems to have increased during this phase. Pueblos of between two and eleven rooms are common, and several pueblos have more than twenty rooms, with Elden Pueblo, with 64 rooms on the first floor and a postulated but unproven second story, being the largest. Single room structures other than field houses are fairly rare. As this suggests, the trend toward aggregation that has been proposed for previous phases seems to have been carried into the Elden phase.

In addition to larger villages, the sites seem to be placed in clusters, with a large site in the center and smaller villages grouped around it. Large sites are always several kilometers away from each other. For example, "Elden and Turkey Hills pueblo are spaced about 5 km apart and each appears to have a set of contemporaneous hamlets, farmsteads or temporary sites close by" (Wilcox 1986:32). In addition, few sites are found beyond 3
km from a large village, and "several areas that were occupied are abandoned [at this time]" (Wilcox 1986:32). Whalen (1981) has noticed this pattern in other areas of the Southwest during this period; and Ellis has suggested that, in the case of historic pueblo societies, the general "settlement pattern seems to have consisted of a fairly good-sized village", beyond which "lay some smaller, socially attached, scattered or group houses" (Ellis 1976:60).

It is important to note that this aggregation into both larger villages and larger inter-village communities may not have involved wholesale movements of people. In fact Wilcox (1986) has suggested that what is happening in this phase is merely an intensification of the hamlet-farmstead-fieldhouse relationship that existed in previous phases. Traditionally, the hamlets had been fairly stable, while the smaller settlements had moved around a great deal within a circumscribed area. During this phase, however, pueblos appeared at the top of the site hierarchy, and emerged as centers for a more complex settlement pattern. However, the placement of the smaller sites suggests that this aggregation took place in such a way that the traditional territorial rights of the inhabitants of the area were maintained. "The clustering of settlements around the nucleated villages in many of the same areas that had long been occupied implies that territorial rights were aggregated as the local populations tried to hold onto what was theirs" (Wilcox 1986:112).

The new architectural forms that emerge during this period
emphasize the changing nature of population dispersal that was mentioned above. "When viewed temporally, there is a clear shift from villages with several structures in periods 1A-1B [1050-1100] to multi-room pueblos in period 3 [1150-1200]" (DeBoer 1980:29). These nucleated pueblos are structurally quite similar to those found in modern pueblo societies. The pueblos appear to be multi-family dwellings, which included, besides the basic habitation rooms, separate storage rooms and ceremonial structures (Adams 1983). From ethnographic data we know that a family would typically occupy from two to four rooms, including storage space (Ford 1968).

As the architecture began to change, work patterns almost certainly followed suit, underscoring the "contribution of architecture to the maintenance or disruption of cultural systems and population systems" (Moore 1978:15). Gilman (1987) suggests that, with the advent of these nucleated pueblos, more and more day-to-day activities were moved from the outside activity areas where they had previously been performed into specialized areas within or on top of the habitation blocks. Hill, in his analysis of Broken K Pueblo, has found evidence which supports this hypothesis. He discovered that the people of the pueblo performed at least seven basic activities in their habitation areas: food preparation, eating, water storage and use, manufacturing hunting tools, pottery finishing, manufacturing ornamental items, and sleeping (Hill 1970b:48-51).

Another new feature of the nucleated pueblos was the number of storage rooms that they contained. Storage rooms are generally small, poorly lit rooms, which lack the basic household
features found in habitation rooms. Generally, these rooms are found in the interior of the room block and have no direct access to the outside (Adams 1983, Hill 1970). Plog (1974:137) has found that storage space increased dramatically during over time. His evidence for Broken K Pueblo indicates that storage space per dwelling unit went from .28m$^3$ in A.D. 700 to 4.78m$^3$ by A.D. 1200. Upham (1982) describes a similar trend for the Southwest in general, and believes that, by 1150, 41% of all rooms were used for storage. Such a large scale-shift in the utilization of domestic space suggests that the relative importance of stored foodstuffs rose dramatically during this time. Forde (1931:393) has stated that every Hopi family "endeavors to maintain the greater part of a year's crop in reserve ... since drought, flood, wind, or pests may destroy an entire crop". It is entirely possible that the Elden phase Sinagua were doing the same thing. Whether or not such a strategy was practiced in earlier phases is hard to determine; but the fact that "molds [grow] less rapidly ... if corn [is] stored in ... masonry granaries above ground rather than in pits" (Colton 1960:12) as was the practice in previous phases combined with the evidence for a marked increase in storage area after the advent of nucleated pueblos suggests that it was only during the middle to late twelfth century that stored foods assumed the role that they now play in modern pueblo societies.

In addition to changes in the patterns of use and sheer number of storage rooms, it appears that communal architecture achieved an increased importance in the Sinagua's everyday lives.
More and more of the structures that were being built during this phase seem to have been intended for public use and were, in all likelihood, constructed as community projects. This is most obvious in the room blocks themselves. Wilcox (1975) has demonstrated that archaeologists can trace the building stages of these pueblos by looking at such information as wall relations, wall openings, construction technique, stratification, and tree-ring dates. This has been done for several large pueblos. What has emerged is a belief that, although the pueblo were built over a span of several generations, the additions that were grafted onto the core fit into the general pattern of the previous rooms and "make it look as if the development were carefully planned" (Hill 1970b:10). Fewkes's map of Elden Pueblo (1926), showing a three-sided structure with an open, plaza-like area in the middle, presents a good example of a presumably planned Sinagua pueblo.

Besides the room blocks themselves, there were other structures which could have been utilized by large groups of people. A "large community room is present at every major Elden phase pueblo" (Hohmann 1982:51), and some of these villages had more than one. Some of these were designed for outdoor activities, such as Wupatki's masonry dance plaza (Stanislawski 1963) and the plazas at Elden Pueblo (Fewkes 1926, Madsen 1982) and New Caves Pueblo (Madsen 1982). Others seem to have been intended to provide shelter and, perhaps, some element of secrecy (Brandt 1980) to the events which took place in them. These structures have been classified as either community rooms or kivas, depending on their size, architectural style, artifact
assemblages, and associations with surrounding structures (Madsen 1982; Kelley 1971; Hohmann 1982; Colton 1946, 1968). Communal structures such as these seem to have been concentrated in the larger pueblos, but, as Kamp and Whittaker (n.d.) have shown in the case of Lizard Man Village, smaller sites could also have their own community rooms.

There is a good deal of controversy over whether the changes I have noted in settlement patterns and architectural style were accompanied by significant shifts in the Sinaguan subsistence strategies. Kelley believes that agricultural practices "seem to have changed little from Padre to Turkey Hill phases" (Kelley 1971:71). However, I believe that this statement is an oversimplification of the events of this time period. At the very least, this period of Sinagua development was characterized by a marked increase in the extensiveness of agricultural strategies; and it is possible (Upham 1982) that some intensification may have occurred, although the evidence is a good deal less conclusive than might be hoped. It does seem logical to me to assume that "large nucleated populations would have to invest greater amounts of labor in a smaller per capita area to produce enough food to satisfy the nutritional requirements of the populace than would smaller populations living in a dispersed settlement system" (Upham 1982:110); but I do not have the data to prove that this occurred in the Flagstaff area at this time. Given this, all that can confidently be stated about the agricultural strategies of this period is that they were practiced on a significantly larger scale than they had
been previously. There are several pieces of evidence which support this interpretation.

The data that has been derived from the Sinagua agricultural implements definitely suggests that intensification did not occur. It does, however, provide evidence, admittedly circumstantial, for the proposed increase in the extensiveness of the Sinagua agricultural strategies. Both Hohmann (1982) and Colton (1946) believe that there were changes in the frequency with which agricultural tools appeared. This suggests that, while there were no recognizable periods of intensification, the extensiveness of the Sinagua agricultural system was on the rise. This interpretation does, admittedly, have its problems. What evidence there is consists mostly of subjective estimations and impressions. Perhaps the true nature of this dilemma is demonstrated best by Kelley who, in one place, states that "there seem to be a greater number of these grinding and supposed agricultural implements per site and within sites during Elden phase than previously" (Kelley 1971:56); but who later suggests that "the artifact forms, their numbers, and distribution seems to have been similar in most post-eruptive decades and were employed without much change during those years" (Kelley 1971:60). My general impression from my research is that Hohmann is right in stating that this period is characterized by "increasing numbers" of agricultural tools (Hohmann 1982:71), but this is just an impression.

Fortunately, archaeologists do not have to rely on impressions for answers to the question of whether or not the Sinagua of the Elden period were involved in increasing the
extensiveness of their agricultural system. Instead of confining the analysis only to tools, I believe that it can and should be extended to include other aspects of agricultural life. These new categories of data will demonstrate that there was a marked increase in the extensiveness of these systems during this period.

Ester Boserup believes that the "first spontaneous reaction of tribal or peasant families to population growth within their community is to look for additional land to cultivate by the traditional methods" (Boserup 1970:101). While I don't agree with her thesis that population growth is the sole or sufficient cause of agricultural intensification, I do see some value in her emphasis on traditional methods being any society's first step in attempting to increase production. The logical initial move in such a situation would be to increase the number of fields being farmed by the traditional method; and, if possible, to increase the fertility of those fields as well. Such a strategy could be implemented without adopting new tools or techniques.

The evidence seems to support the idea that the Sinagua were involved in opening up new fields and increasing the productivity of old ones during this phase. Several strategies may have been utilized. The first involves the use of water- and soil-control features. Vivian (1974) and Plog and Ganett (1972) provide excellent descriptions both of the nature of these features and of their use and importance in agricultural strategies in the Plateau Southwest. As I have already mentioned in the previous chapter, the Sinagua used grids, check dams, terraces, and small
reservoirs to increase the amount of water their fields received and to control the loss of valuable topsoil. DeBoer believes that, although these features were used, they do not concentrate in the Elden phase and, instead, are "fairly evenly distributed over time" (DeBoer 1980:120). However, he notes that his data comes from "a high altitude zone where small climatic changes may have had a major impact on agricultural feasibility" (DeBoer 1980:9). Given the colder temperatures that characterized the Elden phase, this may account for the lack of agricultural features found in his survey. I believe, instead, that there is evidence for "extensive [agricultural] activities" during the last part of the twelfth and early part of the thirteenth centuries (Hohmann 1982:71). This may have involved an increased number of check dams, grids, and other agricultural features, but more work must be done in this area before this can be accepted without qualification.

The final strategy that was available to the Sinagua, and the one I contend was used most often during the Elden phase, was the opening up of additional fields that were far enough away from the main pueblos to necessitate the construction of field houses. Again, DeBoer doubts this. He believes that "field houses are a truly minor part of the [Elden phase] settlement system" (DeBoer 1980:118). However, as I noted above, his data are probably not representative of the overall pattern for the Flagstaff area during this period. McCormack (n.d.), Madsen (1982), and Pilles (1979) all present evidence which suggests that the number of field house increased dramatically during this time. It seems that the large pueblos remained near the "optimal
farmlands", while the smaller farmsteads and field houses were associated with tributary washes, scattered soil pockets, and other "areas that might be considered of secondary agricultural importance" (Pille 1978:130). The increase of fieldhouses suggests that more and more of these areas were being opened up, and that they were being used to increase the food supply available to the people of the newly aggregated pueblos. A family probably farmed several of these small fields in any given season (for a Hopi example see Ward 1978); and these plots were probably located in areas with as diverse an environmental pattern as possible to guard against drought, wind, hail, and frost damage to crops. DeBoer's data suggests that these fields did not extend onto the slopes of the peaks.

The above archaeological evidence seems to indicate that there was an increase in the extensiveness of Sinagua agricultural strategies during the late Padre and early Elden phases. I agree with Hohmann (1982:73) that this development was "fully enacted by the middle Elden phase". After about A.D. 1200, it is possible that unfavorable environmental conditions rendered agriculture increasingly unfeasible, as Hevly et al. (1979) suggest. However, this does not mean that the Sinagua did not try to continue producing corn on both their old and new fields. Whether or not this period was also characterized by an intensification in agricultural practices is, I think, still an open question. It is reasonable to expect that such a course of action might well have been adopted, but I am, at this juncture, unable to prove it.
The increase in the extensiveness of the Sinagua's agricultural systems should not be regarded as indicating that hunting and gathering ceased to be important activities for the Sinagua. If anything, Kelley believes, "hunting activities were more frequent and may have involved a wider selection of animals" (Kelley 1971:71). DeBoer disagrees with this, and believes, instead, that "game was a minor and occasional component of Sinagua diet" (DeBoer 1980:121). However, there is a good deal of evidence that DeBoer's conclusions are incorrect. Kamp and Whittacker (n.d.:20) refer to "the plentiful faunal remains at Lizard Man" Village and the over 100 projectile points that were found there. In addition, the bones of mule deer, bighorn sheep, coyote, bobcat, black bear, jackrabbit, cottontail, squirrel, birds, and a variety of rodents were found in the room-fill at Elden Pueblo (Hevly et al. 1979). If the Sinagua were increasing the frequency of their hunting activities and utilizing a wider range of fauna, and it appears that they were, then that would correspond well to what Reid (1978) has predicted we should find if a society is attempting to expand and diversify its economy during a period of stress. Speth and Scott (in press) dispute this conclusion. They argue that, instead of relying on a wider range of faunal resources, horticulturalists tend to become more and more dependent on a few species of large, regularly available animals. While this is an interesting theory, it is impossible to know whether or not it accurately describes the situation in the Flagstaff area. The data on Sinagua hunting strategies must be quantified before archaeologists can attempt to apply Speth and Scott's ideas to this region.
Although Minnis (1985b:106) finds "no evidence for a diversification of plant resource use with increasing population density" in the Mimbres Valley, it seems likely that, in the Flagstaff region at least, the gathering and processing of non-domesticated fauna took on an increased importance during this time, paralleling the rise in hunting activities. Kelley (1971:66) believes that although the data are not very good, the available evidence "seems to indicate a greater use of wild plants for food and other possible uses in Elden phase than before or after". More recent work at Elden Pueblo has shown that this period saw an increase in both cultivated and natural pollen residues in cultural contexts, suggesting that both wild and domesticated flora were heavily exploited during this time (Hevly et al. 1979). It is even possible that wild plants were more important to the Sinagua's everyday subsistence strategies than were domesticated crops (Hevly et al. 1979; Hill 1970; Reid 1978).

A final method the Sinagua may have used to obtain the food necessary for their survival was through the mechanism of exchange. Winter has proved that the Anasazi of Southern Utah had a system of trade in which "farmers in local areas were sharing maize among themselves, perhaps through social, economic, and religious forms of exchange" (Winter 1984:123). Whether or not this occurred in the Flagstaff area remains to be proven. Kelley believes that the Sinagua engaged in "little or no economic exchange" of foodstuffs (Kelley 1971:109), and this has been the standard view of most archaeologists over the last two
generations. These people note that food is quite bulky, and that it would be inefficient to attempt to transport a large quantity of it any distance at all. Lightfoot (1979) and Upham (1984b) disagree with this position. They believe that, while the effort expended to both transport the food and supply the traders would have to be great, "subsistence products could be moved over relatively large areas without serious loss of subsistence yield" by using the "down-the-line method" (Upham 1984b:303). This involves food being passed from village to village until it finally reaches people to whom it is more valuable as a food resource than as a trade good. With this kind of system in effect, no village would have to expend all that much energy, but the goods could still be transported over a great distance. Even with this system, "the maximum range of a prehistoric food redistribution network would probably not extend much beyond a 50 km distance" (Lightfoot 1979:332).

In all likelihood, the Sinagua would only have turned to traded foodstuffs as a last resort because, even with the down-the-line method, this resource would still have been more expensive than the regularly available foodstuffs. However, they may have traded their own produce in good years to other villages in exchange for raw materials or status goods (see below). Evidence for such an exchange system seems to rest mostly on these "hard goods". Lightfoot (1979) suggests that the presence of imported ceramics and kivas with associated storage rooms indicates that food was imported. Upham, in his study of the fourteenth century pueblo of Nuvaqueotaka, supports the theory that food was traded in the prehistoric Southwest. He states
that, due to the nature of the surrounding environment, the "importation of food either from within the local settlement system ... or from areas in the regional system would have been required for Nuvaqueotaka's continued occupation" (Upham 1982:185). However, Upham's work is focused on a later, and much larger, pueblo than any we are concerned with, and the support for Lightfoot's conclusions seem to be mostly circumstantial during the twelfth century. Perhaps this is due to the nature of the trade goods themselves. Foodstuffs are rarely found in the archaeological record, and, even when they are discovered, they can rarely be traced to their point of origin. It seems to us that Lightfoot and Upham have proved that food could have been traded; whether it was or not is a more delicate question. Upham's evidence shows that the exchange of food was important in the fourteenth century; and Lightfoot's suggestion that ceramics may represent the only surviving proof of a trade network that included foodstuffs is a logical, if tenuously supported, argument. Given this, we believe that foodstuffs were traded by the Elden phase Sinagua.

Kelley has stated that "adjustments, not adaptations, characterized the Sinagua response in procurement systems" (Kelley 1971:109); but, as the above data on their systems of hunting, gathering, trading, and agriculture demonstrate, these "adjustments" were of a large enough scale that I believe that this period can safely be described as one in which a significant change occurred in the Sinagua economic system. "The archaeological record indicates an ever increasing employment of
agricultural practices reflected by increasing numbers of agricultural fields, water control devices, field houses, and agricultural implements" (Hohmann 1982:71). In addition, this period witnessed a revitalization of the hunting and gathering side of the economy, and, quite possibly, a rise in the relative importance of systems of exchange in the procuring of nourishment, especially in times of stress. These lines of evidence point to the conclusion that this was a period of significant expansion and growth in many sectors of the Sinaguan food-producing/procuring economy.

The changes that have been discussed in the size and nature of the Sinaguan villages and in the nature of their subsistence systems imply that this was a society that was undergoing a radical transition. These shifts certainly influenced every part of Sinagua society. "The existence of large population centers not only requires an increase in the investment of agricultural labor but necessitates a more formal and complex organizational system to manage that labor, to settle disputes, and to systematize the daily activities of large numbers of people" (Upham 1982:110-111). Again, it must be emphasized that Upham is discussing a later, larger pueblo than the ones we are interested in. However, it seems that the Elden phase Sinagua faced many of the same problems that Upham believes were present in the fourteenth century. Bremer has stated that, during the Padre-Elden transition, "the Sinagua underwent a major change in social organization from a simple tribal form of organization during the early period to a more complex, hierarchically organized chiefdom level of organization" (Bremer 1988:24). Whether Bremer is
correct in describing the Sinagua's form of social organization as a "chiefdom" will be discussed below; but it seems to me that he is certainly correct in suggesting that the social system that had emerged in the Flagstaff region by A.D. 1200 was recognizably different from what had come before.

It stands to reason that, due to the increased number of people within the villages, intra-pueblo social organization was different during this phase than it had been in the earlier phases. As mentioned above, new integrative methods would have been needed to allow for the smooth day-to-day operation of the larger, more concentrated pueblos that dominated this period. One such mechanism may have been the emergence of a system of clan groups to replace the previously dominant moiety-like divisions within the villages (Hohmann 1982). Stanislawski believes that this did not occur, and, instead, that there was "a lack of strong class and lineage systems among the Sinagua" (Stanislawski 1963:526). Neither Hohmann nor Stanislawski presents especially detailed evidence for their claims. Stanislawski's argument is based on what seemed to me to be an impressionistic study of architectural patterns; Hohmann's argument is grounded in certain changes in mortuary patterns (specifically, the disappearance of cremation as a burial strategy), which do seem to imply the end of the moiety system, but does not necessarily prove that clans emerged. The only evidence that I could find for the appearance of clans was Hill's analysis (1970) of Broken K Pueblo. Hill's examination of architectural patterns in the pueblo revealed clear-cut divisions
within its structure which may correspond to clan boundaries.

The problem with all of these studies is that they are attempting to find material correlates for what is, in the final analysis, a non-material, emic construction. In modern Hopi society, "the clan is the outstanding feature of social life" (Eggan 1950:62). It functions to integrate the village's lineages into the social, political, and economic life of the pueblo. Through the medium of clan action, food is redistributed to family and village members, people are organized for communal activities, important rituals (both personal and communal) are carried out, and rights to land, political office, and religious paraphernalia are conferred (Forde 1931, Beaglehole 1937, Eggan 1950, Bradfield 1971, Ford 1972). The clans are certainly the most powerful force in modern Hopi villages, and the clan system, when fully realized, "offers competitive advantages as an integrating mechanism" (Goldschmidt, quoted in Eggan 1950:321). However, the occurrence of clans in historic Hopi culture can not be read as definite proof that they existed among their ancestors; and, by the same token, to demonstrate the "usefulness" of clans as an integrating mechanism is not the same thing as demonstrating that they existed. Utility and probability can not be used as a substitute for definite proof. Archaeological evidence for the occurrence of clans must be discovered (DeGarmo 1977).

While I believe that such evidence is, unfortunately, lacking, I also believe that it is reasonable to assume that some form of social organization emerged to cope with the new challenges presented by the changing culture. In addition to the
appearance of clans, another possibility for achieving societal integration might have been the creation of non-kin sodalities to cross-cut clan lines. In the Hopi case, sodalities are groupings of people which have social and religious functions and obligations. Members are drawn from all of the clans. Although the actual organization and administration of each clan and sodality is conducted under fairly autonomous conditions, "each system of organization also overlaps the other in terms of membership, so that an integration of the whole is achieved" (Eggan 1950:116). Within this system, a given inhabitant of the pueblo is dependent not only on his/her real and fictive kin within his/her clan, but also on his/her fellow sodality members. These people are supposed to provide him/her with social, political, and religious support and guidance. Finding archaeological evidence for the existence of such a system is, however, quite difficult. Longacre (1966) believes that such a system may have existed at Broken K Pueblo, and Ford (1968) has suggested a method by which a sodality system could be detected in a prehistoric context; but, to the best of my knowledge, these findings have not been examined with respect to the Flagstaff area data base. As a result, the presence or absence of sodalities in the Elden phase social repertoire must remain, as must clans, the object of speculation. Both of these institutions would lead to "mutual dependence between social groups that would serve as a strong integrating force" (Longacre 1966:100); but, although an argument can be made that such a force was needed, it is impossible for us to say for sure whether
or not these particular institutions were the ones used to fill this need.

While clans, sodalities, and other such integrating mechanisms must, it seems, be classified in the "possible/not proven" category, there appears to have been one other integrating mechanism which can be proven to have been introduced into Sinagua society during this period — a discernible group of elites. Although Kelley (1971:107) has argued that "there is no support [for] increases of social roles or status positions" for the Flagstaff area, this appears to be incorrect. Cordell and Plog (1979) have suggested that recognizable groups of elites emerged throughout the Southwest during this time; and Hohmann has found evidence which supports this claim for the Flagstaff region at least. Hohmann believes that "the Elden phase Sinagua had a hierarchically organized society functioning at a complex chiefdom level" (Hohmann 1982:61). Hohmann's data are derived almost exclusively from burials in the extensive cemeteries at Elden Pueblo. He believes that this is sufficient because a hierarchically organized society should be "reflected in mortuary practices by the association of particular types or large numbers of mortuary offerings that transcend age or sex lines" (Hohmann 1982:9). Given this assumption, his data suggest that there was indeed a hierarchical system in place in Sinagua society during the Elden phase, although whether he is correct in labeling this as a complex chiefdom remains to be seen.

The first piece of evidence which Hohmann cites in support of his conclusion is the appearance of differential access to status markers. He believes that the Elden phase burial
population can be broken down into three distinct segments on the basis of the number of grave goods accompanying each burial. Hohmann found (1982:55) that 63.9% of the people were buried with between 0 and 3 offerings, while 27.1% of the population had between 4 and 12 offerings and the remaining 9% had 14 or more items in their graves. He then noted a further division within the upper segment of the society. In this group he found that 73% of the people had between 12 and 20 offerings, while the remaining 27% were buried with 21 or more objects. What this evidence points to, in Hohmann's eyes, is the appearance of a society which was divided into three tiers, of which the uppermost was further divided into its own higher and lower tier (Hohmann 1982:61). He refers to these upper levels as "a two-tiered decision making hierarchy" (Hohmann 1982:9).

Hohmann presents other data which he believes supports his conclusion that this was a ranked society. In the first place, the amount of energy expended in the burial process seems to have increased during this time, especially for elite burials (Hohmann 1982). Fewkes's discovery of a "skeleton encased or covered by a hard crust of adobe" and accompanied by many pots is an example of this (Fewkes 1926:215). In addition, Hohmann believes that it is during the Elden phase that we first see the rise of burials which suggest the presence of ascribed, rather than attained, status. The elite burials he examined were not only the interments of elderly males. For each high status male burial, Hohmann discovered .67 adult female burials and .50 subadult burials that he believes are rich enough to be characterized as
the final resting places of high status individuals (Hohmann 1982:61). He believes that this reflects the emergence of a tradition of "a nuclear family whose status is ascribed according to the status of the adult male" (Hohmann 1982:61). He notes, in addition, that no females or children were found among the highest status group, and that the lower group in the upper tier contained both high status males and their "families".

Although I find Hohmann's arguments fascinating and, at least in part, convincing, it does seem to me that he may have over-stated his case a bit with respect to how hierarchical the Sinagua actually were. In the first place, his information on grave goods and burial techniques seems to me to only scratch the surface of what can be learned from burials. His paper neglects any meaningful discussion of qualitative differences between burials. Although he does mention that there were differences in the amount of energy devoted to elite as opposed to non-elite burials, he fails to develop this line of investigation. What were the differences? Do the elite burials show any signs of a more complex interment ceremony? Are the grave goods accompanying the elite burials more ornate or labor intensive than those in the other graves? Are these items characterized by any distinctive stylistic patterns? These are only a few of the qualitative questions that Hohmann needs to address before he can confidently conclude that the Sinagua society should be characterized as a complex chiefdom.

Secondly, Hohmann neglects completely any morphological analysis of the burial population. While this is understandable in view of the temporal and monetary constraints that any
researcher must cope with, it still leaves his readers without information that is critically important in determining whether or not the Sinagua were a stratified society. "If we are concerned with status differentiation, we must be concerned with evidence of nutritional stress among age cohorts, the distribution of joint stress and 'occupational trauma' within the population, and we must examine possible correlations between groups identified on the basis of similarities in burial objects and groups defined on the basis of statistically significant clustering of metric and nonmetric morphological observations" (Cordell 1985:193).

The lack of a biological element in Hohmann's analysis suggests that his evidence is not as complete as it should be if he is hoping to prove that the Elden phase Sinagua were organized at the level of a complex chiefdom. Peebles and Kus's article on the archaeological correlates of ranked societies (1977) increases my suspicion that Hohmann may have drawn unwarranted conclusions from his evidence. In this article, Peebles and Kus state that "the test for ranking is not merely the presence of richly accompanied child or infant burials". This is too simplistic and does not reflect the social divisions one would expect to find in a chiefdom-level society. Instead, "a test for ranking based on the mortuary ceremonialism of an archaeologically defined society must confirm the prediction of two clear, independent dimensions of social personae represented in the burials" (Peebles and Kus 1977:431). The first group, which they call the "superordinate dimension", must exhibit "a
partial ordering which is based on symbols, energy expenditure, and other variables of mortuary ritual, and which is not simultaneously ordered on the basis of age and sex" (Peebles and Kus 1977:431). A mixture of sub-adults, women, and men will be found in every level of this group except for the very top, which will be composed exclusively of adult males. The second grouping, the "subordinate dimension", should emerge as a "partial order based on symbols, energy expenditure and other variables, which generally will be ordered on the basis of age and sex" (Peebles and Kus 1977:431). In the latter group, the basic pattern should be that, within a given gender group, the older the person, the higher the rank.

In addition to the above patterns, Peebles and Kus believe that a "chiefdom" must have several other characteristics (1977:431-433). In the first place, there should be a hierarchy of settlement types and sizes, and these settlements should be located in areas which assume a high degree of subsistence sufficiency. Secondly, within any "chiefdom", the investigator should be able to discern evidence for the existence of organized productive activities which can be assumed to have transcended the basic household group. Finally, they believe that there should be indications which point to the existence of society-wide mechanisms to deal with environmental perturbations. If these characteristics are found to be present in a given society, and if it can be proved that there is a burial pattern similar to that which has been described above, then Peebles and Kus believe that that society should be labelled a chiefdom.

The papers by Cordell and Peebles and Kus have helped in
identifying certain flaws in Hohmann's analysis, but they do not 
invalidate it entirely. To be sure, Hohmann makes no attempt to 
deal with the morphological characteristics of his subjects; but 
he does at least attempt to come to grips with Peebles and Kus's 
theoretical arguments, with mixed results. Although the evidence 
available to him was not as broad or inclusive as might have 
been expected, Hohmann seems to have found evidence which at 
least suggests that a section of Sinaguan society may have 
corresponded to Peebles and Kus's superordinate dimension. In 
addition, the data which I have presented in regards to Sinagua 
settlement patterns and agricultural strategies suggest that the 
Sinaguan had centrally located settlements and, perhaps, 
community-wide activities aimed at producing a living and dealing 
with environmental problems. However, the existence of any of 
these characteristics in Sinaguan society is, as I hope this 
analysis has pointed out, problematic in one way or another. The 
evidence is not clear-cut enough for me to state for sure that 
all of these activities definitely took place.

Given the nature of the evidence, I disagree with Hohmann's 
claim that the Sinaguan society of the Elden phase should be 
characterized as a complex chiefdom. I believe that Hohmann was 
right in asserting that the Sinaguan society became more complex 
and hierarchical during this time, but the data do not seem to 
support the interpretation that this was a complex chiefdom. It 
seems more accurate to describe the Sinaguan society as being a 
(perhaps) covertly ranked system, which contained many 
characteristics that we tend to associate with a chiefdom, but
which, in the final analysis, cannot quite conform to the level of complexity expected of chiefdoms. This is not to say that there were not people in the Sinaguan society who can accurately be characterized as being elites. "The organization of people into larger groups requires mechanisms of conflict resolution, task apportionment, and resource allocation that can lead to the development of part- or full-time task and craft specialists and administrative personae" (Dean 1988:36). Although there are few suggestions in the literature that this period witnessed the rise of a recognizable group of artisans (Hohmann 1982 mentions it as a possibility), the evidence does suggests that an elite group, capable of organizing political, social, economic, and religious activities, emerged among the Elden phase Sinagua, and that these people achieved some sort of status in their society.

I have suggested that the modern Hopi should serve as a model in our attempts to reconstruct the Sinaguan system. This seems to be particularly appropriate in this case. Traditionally, the Hopi have been regarded as an egalitarian culture (Beaglehole 1937), whose leaders are believed to have "a minimum of secular authority" (Eggan 1950:106). However, more recent work (Upah 1982, Reyman 1987, Brandt 1954), and a reevaluation of past data, has convinced many people that "all of the pueblos are rank societies, and at least several are stratified" (Reyman 1987:122). This will be dealt with in more detail in Chapter 5, but for now it is enough for us to know that these researchers believe that: an upper class, composed of adult males, does exist in Hopi society; this class's power seems to stem from their control of knowledge regarding clan and society.
rituals; they have a good deal of social and economic influence; and they are able to control entrance into their ranks. I believe that the evidence from the Flagstaff region points to the existence of such a system among the Sinagua. The elites of the Elden phase were at the very least the leaders of their respective lineages, and quite possibly they occupied the same positions in their clans or sodalities. I believe that they had the power to, either directly or indirectly, maintain village harmony, organize work parties, direct religious ceremonies, control aspects of the redistribution of land and material goods, and control trade with other villages or regions. Whether their power was recognized through specific badges of office or not seems to me to be an open question; but it seems likely that their power was a social (if not a material) reality and that their commands were obeyed. As such, they would serve an important integrating mechanism within the new pueblos. As Johnson has noted: "Decision-making hierarchies essentially allow the coordination of a larger number of activities and/or integration of a larger number of organizational units than would be possible in the absence of such hierarchies" (Johnson 1978:87).

The changes that I have described in the realm of intra-pueblo relations were accompanied by new developments in the Sinaguan pattern of inter-village interactions. There appears to have been an increasing amount of contact between pueblos during this time. This contact occurred both within a given settlement cluster and between widely separated systems. Much of this
activity, although by no means all, was focused on exchange. The trade assumed two very different levels: "local exchange within and between settlement clusters, which may have involved a primary emphasis on subsistence products, and regional exchange between settlement clusters in which non-local 'hard goods' were circulated" (Upham 1982:116). Source analyses performed on the latter category of artifacts shows that this type of exchange involved trade with peoples in California, southern and western Arizona, the Hopi area, and western New Mexico (Stanislawski 1963). Few people question the theory that both local and regional exchange occurred during this phase. It seems likely that "apparent settlement specialization with accompanying exchange patterns increased internal interdependence for certain important commodities" (Kelley 1971:110). Despite the acceptance of this pattern, however, there still remain some serious questions to be answered about Sinaguan trading patterns. The most important of these, for the purposes of this paper, is who, if anyone, controlled the exchange?

Many researchers (Hohmann 1982; Upham 1982, 1984b; Lightfoot 1987; Upham et al. 1981) believe that the major sites, and, in particular, the elites at these sites, controlled the systems of exchange that emerged during the Elden phase. They suggest that the large pueblos "reflect functions of redistribution centers coordinating economic, political, and social activities on both an intra- and inter-regional basis" (Hohmann 1982:67). Foodstuffs and luxury goods are believed to have been brought into these centers and then, through one mechanism or another, sent out to the smaller surrounding settlements or other large
pueblos. There is some evidence to support this idea. As I have discussed earlier, subsistence goods are notoriously hard to track, but there are many examples of preserved luxury goods in the archaeological record (Colton 1946). These consist of items made from scarce raw materials, imported ceramics, and artifacts which would have required a great amount of time and skill to make. Upham (1982, 1983, 1984b) has suggested several ways in which these exotic trade goods may have been used by the Sinagua. Most importantly, they would have been used by their owners as symbols of status and prestige. According to Upham, the local exchange of exotic goods and any type of long-distance exchange should be seen as "a symbolic activity organized by the elite and specifically intended to enhance the prestige of the political body" (Upham 1982:121). Hohmann (1982) argues not only that the large sites controlled the trade in luxury goods, but also that certain individuals within those sites were controlling certain trade networks. As evidence for this, he cites a male burial at Elden Pueblo that included 78% of all the Cibola White Ware (an imported ceramic type) found in burial contexts; and "other burials from other sites demonstrate similar proportions of Little Colorado White Ware, Tusayan White Ware, and significant amounts of turquoise and other minerals" (Hohmann 1982:57). Upham suggested that, besides serving as status markers, these luxury items may have served as a type of unofficial currency, which could be "'banked' as a hedge against potential crop failures" (Upham 1984b:303). These goods could be reconverted into food in times of trouble by trading them to the elites of
another pueblo which was not having such a bad time. Plog (1974) believes that the kivas and ceremonial rooms at the large sites served as the locus for this trade.

The interpretation that the major pueblos controlled the trade that occurred during the Elden phase has been disputed by Kamp and Whittaker (n.d.). Their work at Lizard Man Village has convinced them that the large sites "may have been more the loci of many trade activities than the controllers of them" (Kamp and Whittaker n.d.:29). Lizard Man Village dates from A.D. 1064 to 1223. It probably never contained more than three families at any given time, and there is no reason to believe that it was a major center for economic, social, religious, or political activities. However, "with the exception of a few exceedingly rare items, the population here was receiving and disposing of the same sort and quantities of goods that are supposed ... to characterize the elite factions of society" (Kamp and Whittaker n.d.:21). The site contains: 330 individual pieces of shell, and a necklace containing 164 shell beads; 51 pieces of argillite, in various stages of manufacture; and two burials that would be considered to belong to the elite segment of the society if they had been found at a larger pueblo. The "elite" burials are especially interesting because one is of a young woman and the other of a crippled child. These data led Kamp and Whittaker to conclude that the smaller sites were, contrary to the opinions of Hohmann and Upham, relatively self-sufficient in terms of their subsistence activities and autonomous in their exchange relations. They do not completely reject the role of the larger sites as important community centers (Kamp and Whittaker
n.d.:27), but they do not believe that this system was highly centralized or institutionalized. "Small sites like Lizard Man Village", they believe, "were clearly more than the homes of low-status farmers" (Kamp and Whittaker n.d.:29).

Kamp and Whittaker's argument is persuasive. Upham et al. (1981) have suggested that, in the case of an extremely complex managerial system, some elites might move from the central site to the smaller out-lying sites to oversee operations, but the Sinagua do not seem to have the level of complexity that I would expect to find if this system was in effect in the Flagstaff area. However, despite the persuasiveness of Kamp and Whittaker's argument, I am not ready to completely reject the notion that the large sites served as local and regional centers. There is a good deal of evidence that these sites were the ceremonial hubs of their regions.

It seems that the rise of the pueblos, and their shouldering of much of the burden for the society's ceremonies, coincides with the disappearance of the ball court network which had helped to integrate the region in the early 1100s. Both Wilcox (1986) and Madsen (1982) suggest that the courts were still being used into the early part of the Elden period, but the dates provided by Colton (1946) and Kelley (1963) suggest that this may not be the case. Of the ten courts that are believed to belong to the post-eruption era, Kelley (163:110) believes that six fall within the period 1070-1120, one dates from 1120-1200, and three have not been dated. This suggests that most ball courts were abandoned by the beginning of the Elden phase. This
interpretation is strengthened by the fact that the one late ball court that Kelley cites is the one found at Wupatki Pueblo. Stanislawski, in a detailed study of this pueblo, has stated that "the court was probably contemporaneous with the initial phase of Wupatki Pueblo", which he defined as between 1080 and 1120 (Stanislawski 1963:524).

The disappearance of the ball court network left a gap in the Sinagua social and ceremonial calendar. This was filled, in large part, by the first-order sites. The presence of kivas, community rooms, and large plazas suggests that ceremonial activities were being conducted at the larger sites. The size of these structures, and their relative scarcity at smaller sites, points to their use for inter-community, as well as intra-village, rites and ceremonies. "By the late Elden phase ... the architectural evidence reflects a formalized pattern of ritual community architecture" (Hohmann 1982:72). This pattern suggests that the larger sites were seen by both themselves and their neighbors as being the centers for their areas' ceremonial rituals.

The association of ceremonial rituals with the larger sites after the demise of the ball courts may indicate an increase in the overall power of these sites in the local and regional systems. During the era of the ball courts, the courts themselves were the most prominent ceremonial features that the Sinagua had (Kelley 1963). However, "Southwestern courts are generally on the peripheries of settlements and are not in a[ny apparent] relationship to other ceremonial structures" (Kelley 1963:67). While the ball courts were usually near a large
village, they may not have "belonged" to those sites. The fact that they were set off from the villages suggests that they may have been viewed as the property of the local settlement system as a whole. The ceremonial structures of the Elden phase were, on the other hand, incorporated into the architectural structure of the pueblos, and the rituals that were performed in them may have been associated with the pueblos themselves. As this indicates, the smaller sites were, during this phase, "partially dependent upon religious leadership from" the large pueblos (Stanislawski 1963:521).

The ceremonial structures may have had other uses besides their apparent role in tying the local villages together into a coherent ritual community. The kivas and community rooms may have served as redistributive mechanisms for the local community, much as they do in Hopi society (Ford 1972); and the plazas may have been used, at times, as "open air markets" in the style of the historic Hopi's inter-village gatherings (Beaglehole 1937:81). In addition, Upham (1982, 1984b) and Plog (1983) believe that the elite of the different centers may have been connected by something more than trade networks. These people may have been involved in a system of inter-community social and religious obligations; and the community structures are certainly places where these meetings could be carried out. While the Hopi have no equivalent custom, the Tewa regularly send members of the group known as the "Pa Towa" ("the made people") to other villages to share ritual and medicinal knowledge (Ford 1968). This possibility introduces a new perspective on Kelley's
hypothesis that there was "both specialization within and interdependence between pueblo settlements" (Kelley 1971:106-107).

The evidence seems to suggest that the largest sites in the Flagstaff area served as social and ritual centers for the surrounding villages. However, I agree with Kamp and Whittaker that "the probable central place of the large sites in the ritual cycle may or may not imply a parallel economic importance" (Kamp and Whittaker n.d.:29). In all likelihood, the amount of economic centralization in Elden phase life has been overrated. While "the very highest status individuals may have occupied only the large sites" (Kamp and Whittaker n.d.:29), people of substantial wealth and status were also present at the lower-order villages. However, this qualification of Plog and Upham's economic argument should not be read as a rejection of the argument that the Sinagua social system became much more complex and hierarchical during this phase. The increase in population, the intensification of economic activities, the appearance of nucleated pueblos, the increasing disparity between high- and low-status burials, and the rise of centralized social and religious centers all indicate that the Sinagua system was becoming increasingly ranked and multi-faceted. It may not have reached the level of a complex chiefdom as Hohmann and others have proposed, but it was certainly more complex than the relatively simple tribal system that had characterized the years immediately following the eruption of Sunset Crater.
The last two chapters have been concerned with chronicling the changes that took place in the Sinagua culture from the time when their ancestors were nomadic hunter-gatherers up until the rise of a sedentary, hierarchical society with strong inter-community and inter-regional bonds. These chapters have demonstrated that, during this time, the Sinagua people greatly increased in numbers, and that, as their population increased, their pattern of settlement underwent a great shift, culminating in the emergence of nucleated pueblos. As these trends progressed, a recognizable group of elites emerged and that the society became more centralized. However, despite all of the information that has been presented, I still have not addressed the basic question of what caused the population aggregation and the related changes that so altered the Sinagua culture during the post-eruption period. As Wilcox has stated, their previous "adaptation was quite stable and resilient" (Wilcox 1986:34). The old system had functioned without any discernible sign of
stress for centuries. Why had the people been willing to change such a seemingly successful system? And why did they settle on a system that was "a dramatic change in adaptive strategies, and one that soon failed" (Wilcox 1986:31)?

Many models have been proposed to answer these questions. The most famous of these is the one put forward by Harold Colton. He believed that the eruption of Sunset Crater was the key to explaining all of the subsequent changes in Sinagua culture. The eruption, he believed, resulted in vastly improved fields which, in turn, attracted thousands of immigrants. These included people from areas near Flagstaff, but also families who had previously lived among the Hohokam and Mogollon peoples to the south. The eruption, then, caused "a mixture of cultures out of which in a generation a uniform Sinagua culture with Pueblo architecture emerged" (Colton 1946:311). However, Colton believes that the optimal conditions did not last all that long. The combination of soil deterioration and wind-aided erosion of cinder fields forced the Sinagua to congregate in areas where the wind-blown cinders had collected (Colton 1960). Sinagua cultural development was, Colton believes, shaped and molded by the eruption and its after-effects. All other events, both cultural and environmental, were of secondary importance in comparison to the eruption.

A second interpretation that has been proposed focuses on environmental conditions that had little to do with the eruption. Hevly et al. believe that, during the late eleventh and early twelfth centuries,
"climatic variations occurred that affected local plant and animal communities quite profoundly and certainly appear to be correlated with aboriginal movements in the Flagstaff area. It might even be suggested that such influences at least indirectly may have provided a stimulus for cultural evolution" (Hevly et al. 1979:510).

They go as far as to state that temperature and effective moisture were "responsible for population growth and decline" (Hevly et al. 1979:517). They believe that the favorable conditions that were present during the first half of the twelfth century led to an increase in agricultural production and that that, in turn, led to population growth. In their opinion, "climatic change must be regarded as the ultimate cause of the given demographic trends" (Hevly et al. 1979:517). Once these conditions changed for the worse the Sinagua were, they believe, faced with three options: change their cultural practices; continue their current practices with disastrous results; or move to a new area. For the most part, the people changed their cultural practices, "reflecting cultural development in the face of ... stress caused by ecological change" (Schroeder 1965:17).

Both of these scenarios have their problems. Colton's model, despite being supported by some scholars (Stanislawski 1963, Hartman 1976), has come under attack within the last ten years. Peter Pilles has been the person most directly associated with the anti-volcanism school of thought. He has presented evidence (Pilles 1979) that Colton overestimated the amount of population growth that occurred in the post-eruption period. Colton's population estimates were based on the large number of post-eruption sites, but Pilles has suggested that Colton misinterpreted the data. Pilles has shown that 60-80% of all the
sites from this period are fieldhouses (i.e., not habitation sites), as opposed to the pre-eruption period in which fieldhouses made up only 25% of the known structures. Thus a simple comparison of the site-counts of the pre- and post-eruption years might very well reveal that post-eruption sites out-number pre-eruption ones, but this would not necessarily indicate a corresponding rise in population.

Pilles does believe that the population of the area increased after the eruption. However, he thinks that this increase was much smaller than Colton suggested. In line with this view, Pilles has rejected Colton's hypothesis that the eruption precipitated a land-rush by people of different cultures into the Flagstaff area. Pilles does not deny that contact with neighboring people occurred, but he believes that this contact was characterized by "trait-unit intrusion, rather than site-unit intrusion" (Pilles 1979:477). He believes that there is little evidence for any sort of immigration into this area during this time. As a result of Pilles's arguments, Colton's theory is now regarded as something of historical interest, but which is not terribly useful in helping people to understand the Sinagua cultural development during the eleventh and twelfth centuries.

The environmental causation model has also come in for its share of criticism. Much of this paper has been devoted, explicitly or implicitly, to the theme that it is overly simplistic to view the environment as the prime mover in the process of cultural change. Instead, I believe that researchers should view the ecological conditions as guidelines within which
people have a good deal of decision-making latitude. The choices they come up with are not predetermined by environmental phenomena, but, instead, are contingent on individual preferences and societal pressures (Cowgill 1975b). The Sinagua population did not grow simply because this was a favorable period for it to do so, nor did they aggregate into nucleated pueblos simply because the conditions worsened. There were social and cultural forces at work behind each of these trends, and it is these factors which we must look to for explanations of the objective phenomena. Archaeologists "should be less occupied with explaining changes as adaptive responses to [environmental] stress, and give much more attention to changes as entrepreneurial responses to, and creations of, new demands" (Cowgill 1975a:130).

I am not completely rejecting environmental factors. To do so would be tantamount to saying that geographic and topographic context is irrelevant, and that all places on the globe are equally hospitable/in hospitable to cultural development. This is, as anyone who has wintered in Northern Ohio can attest, patently absurd. However, I am convinced that environmental factors are too often referred to uncritically when scholars search for explanations for a given cultural phenomenon. It is, of course, appropriate to consider the environment in one's argument, but I believe that "when major changes in sociocultural patterns occurred, they were likely to be ... the product not simply of external forces but of the internal demographic and organizational dynamics of extant societies" (Cordell and Plog
1979:408). As this suggests, I believe that anthropologists must look to both social and political models to explain cultural change. Upham, in looking at patterns of aggregation in the fourteenth century, has created a model which is based on this idea. He states that "populations rarely respond so dramatically to slight or moderate shifts in environmental conditions; social and political factors (recruitment of labor, availability of goods and services, religious considerations) are more powerful attractions in the formation of population aggregates" (Upham 1984b:295). In this model, Upham "rejects the current overdependence on environmental prime movers, replacing them with considerations of social interaction and social process" (McGuire 1983:651). He suggests that there is a causal relationship between "agricultural intensification, the organization of labor, surplus production, and increasing cultural complexity" (McGuire 1983:651). While Upham's model was not designed specifically to explain the development of the post-eruption Sinagua, it seems to Me to be applicable to their situation. I will use Upham's proposition about the importance of economic intensification, political ambition, and social concerns to help to explain why population aggregation took place in the Flagstaff region during the late Padre and early Elden phases. In using Upham as a source for this model, it must be stressed that his original model was designed to explain the development of a larger and more complex system than the one this paper is concerned with. As a result, there will be areas where his model does not correspond to the data that I have. Such discrepancies are inherent in any exercise of this kind and should not be seen as a
fatal flaw in the model.

According to Upham's model, the process of aggregating together into large pueblos offered the people involved several concrete economic incentives to abandon their former way of life. In the first place, the large sites seem to have been situated in areas that have access to the resources of many different ecological zones. In Upham's study, the people living in the pueblo at Chavez Pass would have been able to exploit four different zones in their daily subsistence activities. "It is likely that [these] locational, organizational and economic advantages provided by the locality were critical factors in attracting large numbers of people from the dispersed settlement system to the site" (Upham 1983:228). This pattern seems to hold true for the Elden phase Sinagua. Large sites are commonly found in areas which coincide with the mergings of zonal boundaries. For example, Elden Pueblo, at 2,160 meters, is positioned perfectly to take advantage of the resources available in the ponderosa forests on the mountain slopes, and to exploit the alluvial valleys and the pinyon/juniper zone. The site locations themselves do not, of course, explain why the people were willing to aggregate; but they do suggest that the process was not random and that the Sinagua were concerned with economic factors during this period.

A more significant economic motive for aggregation is that an increased number of people in a village would make it possible to intensify economic strategies and thus increase economic security. This advantage would extend into all phases of
economic life, but agriculture is the most obvious, and probably
the most important, of these. More workers would mean that new
fields could be opened up and that old ones could be farmed more
intensively. In addition, the presence of a greater number of
laborers would have permitted the people to build new water and
soil control features that would improve crop yields and reduce
or eliminate the need to leave valuable fields fallow. Much of
the energy that would be needed for such activities would only
have to be mobilized for a month during the spring planting, for
another month during the fall harvest, and for perhaps one more
month, spread out over the year, to be devoted to weeding and
field maintenance. To be sure, some people would be required to
devote all of their energies to the crops, but others would be
free at various times throughout the year. These people could
concentrate on hunting and gathering activities to supplement the
village's diet and increase the people's overall resource
security. It is also possible that there would have been enough
labor available in the largest pueblos to permit the appearance
of full-time craftsmen (Hohmann 1982) who could produce goods
both for village consumption and for local and regional exchange.
Even if such a group did not materialize, it is more than likely
that much of the winter months would have been spent producing
trade goods. These would have increased the economic security of
the pueblo by providing a "hard" currency which could be
exchanged with other villages in times of stress.

As I have suggested above, trade was an important part of
the Sinagua economic strategy. The creation of larger villages
would have given the people the opportunity to increase their
trading activities. A large pueblo would have more resources available to trade and more people who could be spared for trading expeditions. In addition, the presence of a large site might very well act as a focus for local trade networks, both because of the number of potential consumers available at such a site and because many of these sites had facilities which could have served as temporary trading centers. The opening of new "exchange channels with groups occupying other localities" (Upham 1984b:301) would have served to increase the economic security of the newly aggregated villages by giving the people access to an increased number of ecological zones. As the volume of trade increased, the chance of a catastrophic famine would decrease.

Economic reasons alone cannot explain the aggregation that characterized the Elden phase. The formation of large villages, while presenting the Sinagua with certain economic advantages, must also have offered the people involved in the process several political and social opportunities that had been previously unavailable to them in their smaller villages. The people for whom this movement held the most obvious advantages were the society's leaders. The larger villages apparently permitted the Sinagua's traditional leaders to gain greater power and authority over their people. The sheer number of people, tasks, and intra- and inter-village activities that need to be organized would have, by necessity, increased the amount of time the leaders spent governing and supervising their people. As the amount of hands-on leadership increased, so would their power and prestige. Admittedly, not every culture places a high value on prestige and
ambition. These factors should not always be seen as motivating influences in the formation of large aggregates of people. However, it seems reasonable to us to propose that, in this case, these factors played a role, perhaps even a major role, in bringing about the aggregation of the twelfth century. We base this proposition on our reading of the available ethnographic evidence.

It has been generally assumed that levels of ambition among the Hopi are relatively low. There is, however, little support for this conclusion. Brandt does state that the "Hopi do not say that they would like to be leaders or have influence, and one gets the impression that their desire for these things is, on the average, relatively low" (Brandt 1954:51); but he qualifies this statement by suggesting that while ambition is not a common thing, it is common, and even approved of, in certain groups of people. Generally, it seems that seeking a powerful position is only approved of in those qualified by birth for the job. Brandt presents a striking conversation in which several Hopi discuss an opening in the office of Hotevilla. They talked about the situation as if it was common knowledge who was going to win; and they spoke scornfully of one man who was attempting to be appointed to the position without the proper connections: "Dan is Sun clan, and they don't have any high offices" (Hopi informant, quoted in Brandt 1954:127). As this suggests, "a desire for authority is approved if one is destined to rule; if one isn't, it is foolish pretense" (Brandt 1954:127). Ambition, then, is tolerated only in the most influential men in the society, who include the leaders of the various clans and the
heads of the village societies. Given what is known about the Sinagua, it is not unreasonable to suppose that such a situation may have existed in the Flagstaff area during the Elden phase. Ambitious Sinagua leaders may have attempted to increase their power and prestige by attracting more people to their villages. Upham et al. (1981) believe that aggregation in prehistoric times is a sign of an ambitious leader who is able to attract and/or produce more followers by increasing production and attracting more trade and inter-regional contact. "Competition between aspiring leaders and the resultant economic maximizing strategies" (Lightfoot and Feinman 1982:81) may account for the intensification in economic and social life during this period. As this suggests, individual motivations can powerfully affect the course of a society's development. "Individual, small-group, and class interests can be held above the well-being of a society as a whole" (Conrad and Demarest 1984:198).

The Hopi example suggests that the chief and the associated elite group had more to gain out of aggregation than simply prestige. A chief and his fellow clan members would stand to gain a good deal of material wealth if they could succeed in attracting a large population with an associated territorial base. Among the Hopi, the chief of the village has several economic advantages over his fellow villagers: he has access to certain key agricultural fields; certain services (plastering his house, planting and weeding his fields, providing his household with firewood and water) are performed by the people on his behalf; he controls the village emergency supplies; and he
controls the assignment of the village's land and water rights (Reyman 1987; Beaglehole 1937; Forde 1931; Brandt 1954). These rights of office benefit not only the chief but also the members of his clan. As controller of the land rights, the chief is in position to make sure that the members of his clan receive many of the best fields; and the chief's clan could be sure that they would not be slighted when it came time to redistribute famine supplies. This leads to a situation in which "some Hopi individuals and groups are, and are known by the Hopi to be, better off in various ways than others ... there is definitely not equality in the Hopi order of things" (Brandt 1954:20). Such a system could have existed among the Sinagua. The elite control of the trade networks (see Chapter 4) certainly suggests that the upper level of society controlled the distribution of certain key goods. It is possible that food, land, and water were also controlled, to some extent, by these same people. In such a situation, "food is a source of wealth and power" (Wetterstrom 1978:88). This system could even have been extended to level of regional exchange, so that "the coercive use of food ... would provide one means of gaining a preeminent position in the regional political and economic system" (Upham 1984:304).

The leaders of the village were not the only people who stood to gain from the aggregation that occurred in the twelfth century. The creation of large aggregates of people would have given the common people a good deal of protection against the ever-present danger of famine. While I have found no evidence for wide-spread nutritional stress before A.D. 1200, Minnis has
noted that "perceptions of increasing vulnerability rather than ... the shortages themselves" are often the key elements in causing economic and social change (Minnis 1985b:8). "Food stress ... logically can lead to increased social integration. This probably happens through manipulation of relationships by participants to provide a varied and secure food supply ..., rather than occurring during immediately devastating food shortages" (Minnis 1985b:196). The shift from small villages to nucleated pueblos may represent just such a manipulation of relationships. "It is suggested that a system of social obligations operating within pueblo populations allowed food to be redistributed between people during times of low productivity" (Lightfoot 1979:321). Since this system incorporated a greater number of people than had been possible in the earlier villages, it would have enabled the participants to have access to goods from a larger number of families and from a wider range of locations. This would have increased the chance that food would be available even in the worst of times.

The exact workings of this system are unknown. However, I believe that it probably resembled the Puebloan system as presented by Ford (1968, 1972) and Eggan (1950). In general, the modern Pueblo system involves the transferring of large quantities of food and other goods from one household to another by means of clan and sodality obligations. "Kinship obligations involve extensive exchange between households and individuals" (Eggan 1950:104). Much of this is phrased in terms of ritual obligations. Ford (1972) believes that these obligations can be broken down into two distinctive types: periodic and non-
periodic. The non-periodic exchanges occur throughout the year and are triggered by changes in an individual's social, physiological, or psychological state of being. These changes take place during such events as marriage, birth, death, sickness, and initiation. In conjunction with these events, the celebrant's relatives and society-mates bring gifts of food, which are either consumed by the household or redistributed to friends, relatives, and others with claims on the family's good will. These non-periodic ceremonies allow for "a flow of food throughout the year, difficult to measure, but nevertheless important for survival" (Ford 1972:10). The periodic ceremonies center on the annual community-wide ceremonies, and "it is during [these] observances ... that the greatest amount of food is redistributed" (Ford 1972:10). The distribution network in these rites encompasses the whole village. Interestingly, these ceremonies "are most numerous in the [late winter] when they are needed to further assist households in short supply" (Ford 1972:12).

In addition to giving their residents a greater resource security, the pueblos may have provided the lower ranks of people with protection against potential enemies. Large groupings would, in-and-of-themselves, be less likely to be attacked than would be smaller clusters; but the defensive character of some of the sites suggests that the protective nature of these pueblos went well beyond the mere gathering of a large defense force (DeBoer 1980). Perhaps the best example of a site which was constructed with defense in mind is the Padre/Elden phase site called New Caves Pueblo (Colton 1946:66-67). Colton found that
the site was built in a leveled-off saddle on a steep ridge. The site was placed right on the edge of a precipitous drop, and the back side of the pueblo is defended by a 300 meter long, breast-high wall. Colton notes that there are three possible "lines" of defense, and that most rooms on the site have the unusual feature of underground "cellars" (Colton 1946:67). The latter may have been used to store water since the site is two miles from the nearest known water source. In addition to defense works, many of the sites in the Flagstaff area are visible to one another, which may have facilitated signaling in times of trouble. "The defensive character of many Elden phase sites, and the intervisibility of many of them in large community clusters (particularly in the Wupatki area), has long been suspected as evidence of intracommunity warfare and intervillage alliance" (Wilcox 1986:41). Matson and Lipe (1978) have found a similar pattern in the Black Mesa region, and they too believe that this suggests the rise of defense mechanisms in the face of resource competition.

A final benefit which the large pueblos could offer to their new members would have been an improved social and ritual calendar. The sheer number of people would have presented opportunities to socialize that would have been unavailable in the smaller, more spread-out villages, and the community rooms and plazas at the large sites would have provided locations for public and private ceremonies that were both convenient and personally meaningful.

We do not mean to paint this new form of community as a
paradise. The Sinagua certainly encountered problems when they began living in large groups. In the first place, communal living was often an unhealthy, unsanitary experience in the centuries before modern waste-treatment facilities and medicinal practices came along. There is no evidence for a widespread epidemic during any phase of the Sinagua culture history, but Kelley (1971:85) has found intestinal parasites such as hookworm, tapeworm, and pinworm in coprolite samples from Elden Pueblo. These samples came from room-fills which have been assigned to the final stages of occupation at the pueblo, so it is possible that these problems got worse with time. In addition to health problems, the gathering of large aggregates of people increases the chances of social strife (Lee 1972). Although the presence of elites and various intra-societal organizations would have provided the society with several mechanisms of conflict-resolution, these may not always have been sufficient. It is possible that the extensive field house network may have had the auxiliary function of being a safety valve. The field houses would have permitted the people to get away from the main pueblo at various times during the year (Wilcox 1978). Ellis (1979) believes that fieldhouses serve much the same function in modern-day pueblo societies.

Although these disadvantages were inherent in the formation of nucleated pueblos, I do not believe that they would have presented too serious a problem for the Sinagua. From the above analysis, it can be seen that the Sinagua may have viewed the Elden phase settlement pattern as being socially, economically, and politically superior to the systems that had gone before. My
emphasis on these factors has provided me with a better understanding of why the Sinagua chose to make the changes that they did than I would have been able to reach if I had simply examined environmental factors alone. Admittedly, the above analysis fails to address the question of why the Sinagua chose this particular point in time to aggregate, and it is here that I believe the environmental factors, which I have neglected so far, must enter into the analysis. I have presented a model which suggests that the Sinagua society was characterized by a gradual increase in complexity and centralization during the pre-eruption and early post-eruption years. I have suggested that the changes that took place between A.D. 1110 and 1150 were in line with the developments that occurred in the previous phases. In other words, the Sinagua society changed, but it did so in culturally prescribed and sanctioned ways. The society that emerged from the late Padre and early Elden phases was still recognizably Sinagua. I would suggest, then, that the shifts which this paper has been concerned with can most profitably be seen as arising from forces within the Sinagua society. However, these forces did not exist in a vacuum; the environment must be considered. The 'false spring' that characterized the years 1110-1130 must certainly have played a role in encouraging the Sinagua to increase their population and expand their subsistence strategies; and the onset of colder, drier conditions during the late Padre and early Elden phases must have made the idea of nucleated pueblos (with all of their economic advantages) seem attractive. I am not suggesting that these social changes were
"caused" by the environment, but rather that the interactions of environmental shifts with on-going cultural developments may have created a context in which the observed phenomena became a logical, viable possibility for the Sinagua people.

Upham, then, seems to have been correct in stating that anthropologists should not reject environmental information as meaningless. Instead, they should attempt to incorporate that data into a model which has its base resting securely in cultural and social systems. Although Upham's interpretation of his Chavez Pass data has been questioned recently (Reid 1985), it seems to me that his conclusions are still quite sound. In any event, this dispute does not effect the usefulness of his model for my purposes. I have used it as a base to help me demonstrate that researchers must look to social, cultural, and environmental forces to help them explain the aggregation that occurred in the late Padre and early Elden phases. I have also attempted to demonstrate that individual motivations can powerfully effect any process which involves humans, and, as such, must be examined whenever possible.

Given that aggregation was not a random event but, instead, the result of a series of political, economic, and social decisions made by a fairly large number of individuals, it seems to me that a short examination of the systems that emerged from the actual period of aggregation will help in gaining an understanding of the process of change itself. Much of this has been discussed in one part or another of Chapter 4, so this will only be a brief review of the conclusions that have been reached earlier. However, I feel that it is important for these items to
be summarized in one place so that the full impact of the aggregation can be understood and appreciated.

The economic system that the Sinagua employed in the early 1100s had been altered by the end of the century. While no new technologies can definitely be pointed to as having emerged during this time, I still feel that it is accurate to conclude that the dominant economic trend in this era was towards intensification. It is even possible that, by the last quarter of the twelfth century, this system was producing a surplus. This may have been spurred by the aggregation and the increased trade that accompanied it. Beaglehole has suggested that a similar process occurred among the Hopi: "the ability to indulge in large-scale inter-tribal trade acted in turn as a stimulus to the increased production of corn and woven goods" (Beaglehole 1937:86). Upham (1984b) and Lightfoot (1979) believe that this excess food was traded by the elites for luxury goods, which could be reconverted into foodstuffs in times of stress.

The appearance of trade networks, involving both food and luxury goods, between distant pueblos suggests that the situation in the Flagstaff area was politically quite different in A.D. 1200 than it had been in the pre-aggregation period. The corporate entities that emerged during this period were much larger and more complex than they had been previously. Hamlets, farmsteads, and fieldhouses were incorporated into a regional system that was, to a significant extent, focused on a large pueblo. Exchange occurred both within the local system and between neighboring systems. It is also more than likely that
there was some sort of economic and religious connection between the elites of the different systems. Internally, the people who inhabited the large pueblos witnessed several changes in their system of village organization. Whether these included the appearance of clans and sodalities is still an open question, but I have argued that there was a rise in systems of integration in response to the large aggregates of people.

Although the exact workings of the Sinagua social system are unknown, I am at least fairly certain that the post-aggregation period was dominated by an elite group which had emerged during the previous two generations. These people would have served as an integrating force in the pueblos, but they also seem to have controlled many aspects of the production, distribution, and trade of foodstuffs and luxury goods. Their authority may have been based on a monopoly of ritual power. Upham (1982) and Reyman (1987) both believe that the upper stratum of Hopi society uses this method to insure both their own security and that of their descendants. "Social stratification ... is not based on the acquisition of material wealth but on access to, and possession of, ritual knowledge" (Upham 1982:14). This knowledge is usually quite secret (Brandt 1980) and esoteric, but it is absolutely essential to the survival of the village as a recognizable social and political entity. Not only do the elite schedule and lead the rituals that bring rain and insure the good-will of the Gods, but they also tell the villagers when to plant, harvest, hunt, and conduct routine maintenance activities. In addition to having this knowledge, "priests directly control admission to their ranks and [the resultant] dispersal of
ceremonial knowledge" (Reyman 1987:136). The people that are chosen are almost always agnatic relatives. As a result, an office, and its associated power and privileges, becomes the virtual property of a lineage, and is passed down from generation to generation. For example, the Hopi office of village chief "descends within the Bear clan and is a hereditary office" (Upham 1982:15). Whether or not this exact situation occurred in the Sinagua society after aggregation is open to conjecture. However, Reyman notes that "hierarchical status differences based on differential access to ceremonial knowledge and position result in [the] differential access to and control over valued resources" (Reyman 1987:28). Similar differences in access to status markers have been documented for the Sinagua.

The emergence of an elite group was paralleled by the appearance of a recognizable underclass. Hohmann's data from Elden Pueblo suggest that there were two different levels within this less-privileged group. If this was the case, the Sinagua social structure would look remarkably like the Hopi's. Reyman (1987:124) believes that the Hopi divide their society up into three groups (he uses the word "classes", but this may not be warranted): the priests and the leaders of the kivas (Mong-cinum); the people who belong to the societies but hold no offices (Pavun-cinum); and those who do not belong to any societies or take part in any ceremonies (Suavung-cinum).

The emergence of large population aggregates, and of divisions within these groups, must have changed the nature of social interaction. It is doubtful whether there were material
badges of office, but this does not mean that the elites were accorded less deference or respect from their fellow villagers. How this affected everyday interaction is impossible to determine; but I can state with confidence that this period witnessed a dramatic rise in communal working parties and living arrangements, which may have been organized and overseen by the elites.

As this brief review suggests, the Sinagua of the late twelfth and early thirteenth centuries lived in a relatively centralized, hierarchical society. This system seemed to function fairly well for several generations but, in the end, it was a failure. By A.D. 1300, the Flagstaff area was virtually abandoned. Several proposals have been advanced to explain this phenomenon. Many of these, for example Jorde's (1977), suggest that environmental factors led to the abandonment. However, I have already highlighted the general weakness of the environment-as-prime-mover school of thought, and these proposals seem no different from the others. Although I have little information on the actual events that occurred during the time of abandonment, it seems likely that it was an extremely complex process, that was almost certainly based on political, social, and economic developments both within the Sinaguan society and elsewhere. The environment may have played a role in this process, but it was not the only factor.

It is rarely, if ever, possible to assign a mono-causal explanation to a particular event. This paper has presented an example of the utility of examining many different aspects of a culture in the quest for the answer to why (and how) a culture
changed. We are convinced that "interactive models that incorporate the dynamic interrelationships among several kind of variables more accurately reflect the nature of human adaptive systems" (Dean 1988:26). In this paper I have demonstrated that a combination of political, economic, and social factors created a context in which aggregation could occur; and that the aggregation itself led to certain key changes in the Sinagua culture and society.

The Sinagua seem to me to be a culture which archaeologists could benefit from studying more closely. Little is known about societies that are less complicated than the classic chiefdoms but yet can not accurately be called tribal. The Sinagua offer an excellent opportunity to examine such a society. Future excavations should be focused on the question of how people interacted within a settlement system. Such an examination should incorporate excavations conducted on both large and small sites. Once this is done, the project could be expanded to include other systems in the hope of defining regional patterns of interaction. In addition, the Sinagua seem to present a rare chance to investigate the connections between an extinct and an extant culture. If a more detailed cultural history of the pre-Hopi/post-Sinagua people is completed, then researchers will be in the unique position of having a fifteen-century-long record of a culture’s history. What I have presented in this paper is only a short piece of this record. I have attempted to draw conclusions about the nature of social and cultural change from this section, and I have a good deal of confidence in the
accuracy of my theories. However, if a longer and more detailed record could be compiled, I could compare my ideas about how and why cultures change with those of other researchers who have examined this very culture at a different point in time. Eventually, I believe that, once the Sinagua and the Hopi are "understood", archaeologists will be able to begin applying their theories and hypotheses to other cultures in other times and other places. In this way, they will be able to begin constructing an accurate theory about not only cultural change in the Southwest or in North America, but in every part of the world.
REFERENCES CITED

Adams, E. Charles

Beaglehole, Ernest

Benson, Charlotte L.


Berry, Michael S.

Binford, Lewis R.

Boserup, Ester

Bradfield, Maitland
Brandt, Elizabeth

Brandt, Richard B.

Bremer, Jon Michael

Bronitsky, Gordon

Catlin, Mark

Cohen, Mark

Colton, Harold S.

Conrad, Geoffrey W., and Arthur A. Demarest

Cordell, Linda S.
1985 Status differentiation and social complexity in the prehistoric Southwest: a discussion. In Status, Structure and Stratification, Proceedings of the Sixteenth Annual Conference of the Archaeological Association of the University of Calgary, edited by M.

Cordell, Linda S., and Fred Plog

Cordell, Linda S., Steadman Upham, and Sharon L. Brock

Cowgill, George L.

Crumley, Carole L.

Darling, J. Andrew

Dean, Jeffrey S.

Dean, Jeffrey S. and William J. Robinson

DeBoer, Warren R.
1980 *The Prehistoric Sinagua: The View from Elden Mountain*. Cultural Resources Report No. 34. USDA Forest Service, Southwest Region.

DeGarmo, Glen D.

127
Dozier, Edward B.

Dumond, Don E.

Earle, Timothy K.

Eggan, Fred

Ellis, Florence Hawley

Fewkes, Jesse Walter

Ford, Richard I.

Forde, C. D.

Gilman, Patricia A.
Glassow, Michael A.

Gould, Richard A.

Grigg, David D.

Hartman, Dana

Hassan, Fekri A.

Hevly, Richard H.


Hill, James N.


Hohmann, John
Irwin-Williams, Cynthia

Johnson, Gregory A.

Jorde, L. B.

Kamp, Kathryn A., and John C. Whittaker

Kelley, Roger E.

Lee, Richard B.

Lightfoot, Kent G.

Lightfoot, Kent G., and Gary M. Feinman

Longacre, William A.
1966 Changing patterns of social integration: a prehistoric example from the American Southwest. American

Madsen, John H.

Matson, R. G., and W. D. Lipe

McCormack, Valarie

McGregor, John C.

McGuire, Randall H.

Minnis, Paul E.

Moore, Bruce M.

Peebles, Christopher S., and Susan M. Kus

Pilles, Peter J.


Plog, Fred

Plog, Fred, and Cheryl K. Gannett

Reid, J. Jefferson

Reyman, Jonathon E.

Schiffer, Michael B.

Schroeder, Albert H.
Speth, John D., and Susan L. Scott

Stanislawski, Michael B.

Sullivan, Allan P.

Upham, Steadman

Upham, Steadman, Kent G. Lightfoot, and Gary M. Feinman

Vivian, R. Gwinn

Ward, Albert E.

Wetterstrom, Wilma

133

Whalen, Michael E.

Wilcox, David R.

Winter, Joseph C.

Wood, Jon Scott

Zubrow, Ezra B. W.
THE SINAGUA AND AGGREGATION:
AN INTERDISCIPLINARY APPROACH TO CULTURAL DEVELOPMENT

Joshua A. Piker
Honors Thesis in Anthropology
Oberlin College
May 16, 1989
CHAPTER 1:
INTRODUCTION

Archeology is, like any good sub-field of anthropology, concerned with the descriptions of, and comparisons between, cultural systems. The evidence used by archaeologists is, however, often of a very different nature than that used by ethnographers or linguists. Language is, of course, not preserved in the archaeological record, and many of the everyday behaviors that ethnographers are able to take for granted are invisible at a distance of two thousand years. This paper will be concerned with the study of social organization and group dynamics. However, determining the "structure" of a prehistoric society is notoriously difficult. Benson has stated that "Social structure has no unambiguous referents in the archaeological record" because "1) it requires relationships and not just units of variables, 2) relationships between elements of social structure are not unambiguous in living societies, 3) structural units are analytic categories of social scientists and are not isomorphic with corporate groups at any scale ... and thus have
Benson is undoubtedly correct in emphasizing the ambiguities inherent in attempting to define and explain a prehistoric culture's social organization. However, it seems to me that it is possible, through careful examination of the evidence, to eliminate many of these ambiguities. By piecing together information derived from different sources and diverse disciplines, archaeologists can construct a reasonably accurate model of the whens, whys, and hows of prehistoric social organization. This paper is an example of such an approach.

The archaeological record, despite its rather obvious drawbacks, does grant researchers the luxury of an unbroken record of prehistoric cultural activities stretching back as far as they are prepared to look. Ethnographers are, by the very nature of their discipline, confined to descriptions of cultures based on observations obtained during a relatively few years in the field. For this reason, much of what is produced by these scholars appears to be thoroughly synchronic. Even the finest ethnographies resemble a snap-shot of a culture. Archaeologists are forced to deal with much larger units of time than other anthropologists. On many archaeological sites, the simple act of placing a trowel in the dirt will take the researcher through a two hundred year accumulation of soil and cultural debris. For this reason, archaeology is uniquely suited to the task of describing and analyzing cultural change (Dean 1988). In this paper I will take advantage of this unique chance to discuss social and cultural evolution (and devolution). I will examine
how and why certain cultural patterns changed, and what effect these changes had on the people who participated in them. By focusing the investigation on change within a given culture, a greater understanding of the processes and mechanisms involved in societal change in general will be achieved.

It is crucially important that, before I go any further, I make clear the differences inherent in the terms "social organization" and "social structure". Benson cogently states that "social organization is the size, scale, and nature of corporate groups (broadly defined as a group that acts as a unit); social structure is the relationship between groups" (1985:181). In other words, a clan or a moiety is a social organization; ranked or egalitarian is a structure. This distinction is critical in gaining an understanding of a prehistoric (or, for that matter, a historic) society. Much of this paper is concerned with changes in social organization and what those changes mean to the social structure. I shall address, either directly or obliquely, such questions as: what effect does the appearance of a moiety-based system have on a previously egalitarian population; how does the appearance of a system consisting of a groups of clans, tied together by various sodalities, aid or interfere with the formation of a recognizable class of elites; and is it possible that a non-egalitarian society could have developed prior to the appearance of clans, sodalities, and other integrative cultural constructs?

The culture with which we will be chiefly concerned with is the Sinagua. These people lived at the base of the San Francisco
Mountains in north-central Arizona, near the present-day city of Flagstaff. Researchers have found evidence of this culture in the area bounded on the north by Deadman's Wash, on the east by the Little Colorado River, on the West by the headwaters of the Rio de Flag, and on the south by East Clear Creek (Madsen 1982; Colton 1968). The Sinagua occupied all or part of this huge area from A.D. 600 to 1300, often shifting their settlements from place to place in response to ecological, social, and political imperatives. Throughout this time, their subsistence system incorporated, with varying degrees of emphasis, agriculture, gathering, hunting, and trading. Their social structure has traditionally been thought of as egalitarian, with families living in isolated pithouses, small pithouse villages, or nucleated pueblos, depending on the time period. Intra-settlement, inter-settlement, and inter-regional organization was believed to be at a minimum. These tenets of the past have been challenged recently by scholars who believe that the social system of this period was more centralized and less egalitarian than was previously thought (Plog 1974, Upham 1982, Hohmann 1982). Much of this paper will focus on this continuing debate. Most researchers, no matter where they stand on the egalitarian vs. hierarchical debate, agree that the Sinagua experienced a period of population aggregation and nucleation sometime after A.D. 1000 (the exact date is contested). This period of demographic and social change will be the setting for much of this paper. I will first address the question of what caused the observed effect. For example, Glassow (1977) suggests six factors which he believes can lead to aggregation: the exchange
of large quantities of goods; frequent engagement in cooperative activities; communication between groups that is both important and frequent; communal houses designed to maximize storage and/or heat retention; marriage patterns; and nearness to crucial social and economic resources. Did any or all of these behaviors occur among the Sinagua of the late 11th and early 12th centuries? If so, is there one factor which we can identify as the prime mover in the aggregation process?

From that point on, the paper will focus on the effects such a change had on the prehistoric inhabitants of the Flagstaff area. Given that "cultures, past and present, may be profitably seen as sets of interlocking and interdependent human actions and systems which are operated in concert" (Kelley 1971:2), it can assumed that changes in one aspect of a culture will generate changes other areas. However, the form these secondary changes may take is by no means predetermined. A system based on hierarchical authority and intensive agriculture could emerge as easily as a system based on egalitarian decision-making and limited farming. The type of system or systems that arouse in conjunction with the population aggregation of this time must be determined; and, perhaps more importantly, I must demonstrate why this particular adaptation(s) was implemented (at least for the time being) at the expense of other, seemingly equally attractive, strategies.

In order to answer these question, a wide range of archaeological, ecological, and ethnographic evidence must be examined. My analysis in based on archaeological materials, but
to exclude other types of evidence seems foolish. Binford (1972b:95) believes that the evidence found in the archaeological record is sufficient in and of itself to provide archaeologists with a clear picture of a prehistoric culture. He states that "the formal structure of artifact assemblages together with the between element contextual relationships should and do present a systematic and understandable picture of the total extinct cultural system". However, I do not share his optimism about the completeness of the archaeological record. In this paper I will utilize archaeological sources from the prehistoric Southwest, in general, and the Flagstaff area, in particular; and these will be supplemented by modern ethnographic evidence drawn from work done among the Western Pueblo. While I believe that "one of the major goals in archaeology is to identify behavioral and organizational patterns not found in the present" (Upham 1982:53), it seems to me that the observable present can give researchers hints about past cultural behaviors and processes. I am striving for "a union of the two approaches, the culture history and the culture process" (Darling n.d.:7).

Ethnographic evidence has several advantages over what can be gleaned from archaeological sources. In the first place, the information that can be gathered by ethnographic observers is much more detailed with respect to people's everyday actions than archaeological data can ever hope to be. A study such as Bradfield's (1971) or Ford's (1968) would be impossible using archaeological sources. Both authors use information gathered from Indian informants to determine how the Pueblo system of agriculture functions. Their data on the division of labor
involved in food procurement and processing, and the information they amassed on the division of resources are much more comprehensive than anything published by archaeologists. In addition to being more detailed, ethnographic sources preserve something which archaeological sources can only hope to touch on indirectly: a people's perceptions, beliefs, and values. These data are critically important. "The way in which people respond [to the constraints of the material world] is influenced by the way in which they perceive the world and by their systems of beliefs and values" (Wetterstrom 1978:81). People's behavior is shaped by their impressions about, and understanding of, the physical and social environment in which they exist. Moreover, different peoples recognize different aspects of the environment as impacting on their lives. In other words, a given group of people may not believe that a certain phenomena has any effect on them at all, regardless of what the "objective" evidence might indicate. As a result, the cognized environment that people react to may be quite different from what an observer may see as the effective environment (Ford 1968). Without a basic understanding of how a people view their physical and social surroundings any study of that group will be inherently flawed. Ethnography is absolutely essential for achieving this understanding.

This is not to say that there are not problems in the use of ethnographic data in an archaeologically based study. Zubrow (1976) has pointed out that ethnographic scholarship, because of
its relatively synchronic nature, tends to portray societies as being static entities. Archaeologists avoid this pitfall. Ethnographic evidence is useful in that it provides researchers with a detailed picture of a culture during a known period of time; but anthropologists have to be aware of the fact that societies are constantly in a state of flux and that the current existence of a particular cultural trait or behavior does not conclusively prove that it existed in prehistoric times. For this reason, analogies which attempt to project a present cultural system onto an extinct society are tenuous at best. Great changes can occur in a very short time, and the further away one gets in time, the greater the chance that fundamental changes may have occurred. In the case of the Hopi, Wilcox (1987:3) believes that the 400 years of European contact has "resulted in great changes in Pueblo demography, settlement size and location, and economy"; and Cordell (1977) has documented differences between Hopi hunting patterns and those of prehistoric Pueblo groups.

Evidence such as this has prompted Lightfoot to state that, "given the external forces at work over the last 300 years, one must question seriously the efficacy of employing contemporary Pueblos as a model for reconstructing past political organizations" (Lightfoot 1987:48). Although Lightfoot is certainly correct in asserting that there have been dramatic changes in Pueblo society over the last few centuries, he is, in all likelihood, mistaken in suggesting that modern Pueblo culture is useless in helping us to get a handle on prehistoric patterns of behavior. Instead of throwing up their hands in despair over
the inevitable changes involved in the passage of time and clash of cultures, anthropologists should attempt to work through the maze of historic and ethnohistoric data which they have available to them. If this is done properly, then I believe that it is to determine which pieces of Pueblo culture are distinctively Puebloan and which are accretions which have been grafted on over time. I accept Dozier's caution that "analogy to ethnographic groups should be restricted to contiguous areas where the history, prehistory, and distribution of sociocultural and linguistic groups are fairly well known" (Dozier 1970:204); but I assert that the Southwest is one place where these criteria are met, and that, as a result, ethnographic analogy can and should have an important role in archaeological investigations of this area's past.

This paper will be focused on the Hopi Indians of Northeastern Arizona. I have chosen them as the primary historic reference group for the Sinagua for several reasons. In the first place, there is a well documented historical connection between the two groups. McGregor believes that the Sinagua "were ancestral to, and contributed to, the development of Hopi culture" (McGregor 1943:296). Archaeological and ethnographic sources point to a migration from the San Francisco Peaks region to the Hopi Mesas in the late 13th and early 14th centuries. Stanislawski (1963) has compiled a good deal of data which suggests that the population of the Mesas rose sharply in the early 1300s, about the same time the Sinagua were abandoning the Flagstaff area (Colton 1960). In addition, he found that certain
material traits that are recognizably Sinaguan appeared in the
cultural repertoire of the inhabitants of the Hopi Mesas at this
time.

Ethnographically, transcripts of the Hopi's oral legends
suggest that at least part of the tribe originated in the San
Francisco Mountain region (Stanislawski 1963). Finally, several
excavations on Sinaguan sites have been conducted with the help
of Hopi laborers and observers. These Hopi have stated that the
structures and objects that were uncovered were definitely
similar to what they were accustomed to seeing in their own
villages (McGregor 1943, 1955). The excavation of "The
Magician's Burial" at Ridge Ruin (McGregor 1943) is an especially
dramatic example of this phenomenon. In this case, the
excavators uncovered an extraordinarily rich burial of a 35-40
year old male, dating from A.D. 1100-1125. The Hopi informants
present at the site were certain that they could "definitely
identify the ceremony represented by the [burial] objects"
(McGregor 1943:295). Perhaps even more impressively, the Hopi,
upon being shown several of the artifacts, were able to predict,
and accurately describe, some of the other objects that would be
found.

These pieces of evidence suggest that there was indeed a
connection between the Sinagua and the Hopi. This is important
in and of itself, but it would not be enough to warrant specific
comparisons between the two societies unless archaeologists could
account for the six hundred years that have passed since the
Sinagua were incorporated into the Hopi world. Fortunately,
through the study of Spanish colonial records and the papers and
diaries of early American explorers, anthropologists have been able to obtain a fairly accurate picture of the nature of Hopi societal change over time (Dozier 1970). These records are, admittedly, a mixed blessing due to the bigotry and ethnocentrism of the early observers, but, with a proper understanding of the biases and motives of the authors, they can be made to reveal a good deal of information about the Pueblo’s contact and post-contact culture. What emerges from such a study is a record of a culture which has, despite being beset by numerous pressures and catastrophes, been able to maintain "substantial continuity in [their] political structures and decision making organizations" (Upham 1982:199). In addition, of all the different groups which make up the Western Pueblo, the Hopi have been least affected by European contact because "the Spaniards did not return in force [to this area] after the Pueblo Rebellion" (Eggan 1950:18).

Since the Hopi have experienced "remarkably little changes in the fundamentals of their culture" (Hill 1970:19), and since anthropologists have been able, through historic and ethnographic records, to document what has changed, it seems that they are a fine example of a tribe which is well-suited for the purposes of cross temporal analogy.

It is important at this point to spell out exactly how the ethnographic data will be used in this study. I believe, as I stated above, that "studies of modern material culture may well inform us about the past" (Cordell et al. 1987:568) if proper precautions are taken in the choice of subject groups. However, this acceptance of ethnographic evidence should not be read as an
attempt to make ethnographic analogy the touchstone on which all of archaeology's theories must be tested. Rather, ethnographic materials should be employed as "background information" (Binford 1972a:60) to aid researchers the process of constructing models of prehistoric behavior. These models must then be tested by making reference to archaeological data. If no evidence is found to support them, then they must be rejected or revised. Too often archaeologists have accepted ethnographic models without testing. No matter how attractive or alluring a model may be, it must be testable within the archaeological record. "Plausibility is not a substitute for evidence" (E. Bright Wilson, quoted in Hill 1970b:13).

This paper will utilize ethnographic, archaeological, and ecological sources to construct and test a model of Sinagua cultural change. I will first present a description of the past and present environment of the Flagstaff area. That will be followed by a relatively brief discussion of the culture history of the region before A.D. 1066, and by a more in-depth treatment of the period from A.D. 1066 to 1300. By presenting the data in this manner, I will be able to determine how and why the Sinagua social and political structure changed through time. I contend that the history of the Sinagua culture is characterized by a trend towards increasing economic, social, and political complexity, and that this trend culminated in the emergence of a system which was dominated by a hereditary group of elites whose power rested on economic connections and the control of key rituals. In short, this system was not characterized by an egalitarian system of social structure, and almost certainly bore
little resemblance to the relatively uncomplex tribal system that many anthropologists have attributed to prehistoric Pueblo peoples.
CHAPTER 2:
THE ENVIRONMENT OF THE FLAGSTAFF AREA

If anthropologists are to gain an understanding of the events which occurred in the past, they must first be able place them in their ecological context. Without this, they will be unable to determine how the prehistoric systems operated, or, indeed, why these systems were chosen at all. The modern city of Flagstaff is located in a ponderosa pine forest at an elevation of 2,160 meters. The San Francisco Mountains rise on the outskirts of town to a height of 3,840 meters. These mountains are the highest natural features in this part of the state. From the base of these peaks, the land slopes down gradually in all directions. The flora and fauna of the area change as the elevation drops. Between 1,980 and 2,280 meters, the country is dominated by ponderosa pines. Junipers and pinyons are found only occasionally in this zone. Below 1,980 meters, the country assumes a more open character, with the major flora consisting of pinyons and junipers. The pinyon/juniper zone fades out gradually until, at about 1,370 meters, the country becomes a semi-arid, open grassland, broken here and there by small bushes
and stunted trees (Madsen 1982).

This pattern of vertical zonation is produced by the interaction two variables: temperature and precipitation. In general, the higher one goes, the colder and wetter the environment becomes; and, conversely, the low-lying areas are characterized by a hot, dry climate. This produces a situation "in which the upper altitudinal limit of a species is usually determined by its ability to function in low temperatures and its lower range is controlled by its resistance to drought" (Hevly 1988:95).

Precipitation is, in general, low for all of the zones discussed in this paper. Even the ponderosa zone, which is by far the wettest of the areas considered, receives only 41-56 centimeters of effective moisture annually (Madsen 1982:9). In contrast, the area around Winslow, Arizona, (1,524 meters) receives only 11 centimeters of rain a year. Precipitation in these zones is "not only low but very uncertain, varying from half to twice normal" (Forde 1931:360). Marked departures from the mean occur both spatially and seasonally. The variations between zones have already been discussed, but there are also significant differences in intra-zonal precipitation. Kelley (1971:40) refers to "the highly localized nature of summer rains and winter snow falls" in the San Francisco Mountain area. As this implies, it is quite possible for one area to receive a thorough soaking while another, half a kilometer away, remains bone dry. Bradfield (1971) has even documented cases among the Hopi in which one man's fields received rain while his neighbor's
crops (literally ten meters away) were missed entirely. In general, the distribution of the rainfall "depends on exposure, prevailing winds, and distance from the mountains" (Hevly 1988:93). However, anyone who has spent the summer in this area can attest to the fact that, from a ground-level perspective, the pattern of rainfall seems to be at best capricious, and, at the worst, malicious.

The seasonal pattern of rainfall exhibits the same degree of variation as the spatial pattern. In general, precipitation occurs in two distinct episodes: violent thundershowers from July to September, and snow from December to March (Colton 1960, Hevly 1988). The fall is usually dry and clear, with occasional short rainy spells; and the months of April, May, and June are characterized by dry, windy weather. During these months wind velocities average twelve miles per hour (Hevly 1988).

It is not unusual for the summer "monsoons" to be late or for the winter snowpack to be less than hoped for; and it is not unheard of for a rainy season to be skipped entirely. This can have a catastrophic effect on the flora of the area, especially the cultivated plants. Page has noted that, for the Hopi, "a 35 percent reduction in yearly precipitation correlated with a 60 percent reduction in crop yields" (quoted in Minnis 1985b:125). Admittedly, the Hopi inhabit a more marginal environment than that which is found around Flagstaff, but this figure highlights the vulnerability of foodcrops to the inevitable fluctuations in annual effective moisture. This is especially true in the Flagstaff area because of the relative lack of permanent standing or running water. There are no rivers in this area which are
reliable on a year-round basis, and "there are about 20 springs below the 8,000-foot contour, hardly enough to supply the entire region" (Pilles 1978:119).

The negative effects of variations in annual rates of precipitation on the indigenous and domesticated fauna is intensified by the fluctuations in temperature which inevitably occur when one is dealing with high elevations. In general, for each 333 meters of elevation change there is a concurrent change of 2.5°C (Hevly 1988:93-93). These shifts in the average temperature have a significant effect on agriculture in all of the zones but especially in the area above 2,160 meters. In this zone, "the major constraint [on agriculture] is the comparatively short and highly variable growing season" (Sullivan 1984:85). The term "growing season" refers to the period when environmental conditions are favorable enough to permit the germination, maturation, and harvesting of a given domesticated species. For example, corn requires a frost-free period of 90-120 days and at least 20 cm of effective moisture (Hevly et al. 1979). The Flagstaff area's mean number of frost-free days is 110, but this figure is only an average. In historic times, frost-free periods as long as 151 days and as short as 86 days have been recorded (Sullivan 1984). A range such as this is a more significant figure than a mean because the flora must adjust to the worst possible conditions, not the best or the average.

As the figures for temperature and precipitation suggest, agriculture represents an extremely problematic undertaking in the Flagstaff area. In addition to problems in effective
moisture and variations in temperature, the area's soils present a problem to any prospective agriculturalist. Much of the land is hopelessly infertile. Pilles (1978) has found that, out of fifty defined soil types, only six are arable. The rest, for one reason or another are incapable of producing an adequate crop.

In many ways, the prehistoric environment was very similar to what has been described above. The basic lay of the land of the area has not changed at all, and, as a result, the ecology of the region was certainly dominated by similar zonal boundaries. Pollen analysis, dendroclimatological, and dendrochronological studies have proven that the country was beset by the same pattern of high-frequency and low-frequency variations in both temperature and precipitation (Dean and Robinson 1977, Hevly et al. 1979, Bremer 1988). Sometime between A.D. 1000 and 1100 the basic environmental pattern shifted. "The increasing portion of pinyon pine pollen composition in the late 1000 and early 1110 (or as early as 925-975 in other nearby areas) suggest warming temperatures and/or diminished annual effective moisture" (Hevly et al. 1979:501). Dramatic changes in temperature and the amount and distribution of rainfall would occur in fairly rapid succession over the next two hundred years, but these would be overshadowed by the climactic environmental event in Flagstaff-area history—the eruption of Sunset Crater in 1065.

The eruption had a marked effect on the topography of the area and, in turn, on the humans who resided in the region. Cinder cones, lava flows, and basaltic extrusions came to dominate the area, and cinders and ash covered much of the region. These new environmental conditions presented both a
challenge and an opportunity for the Sinagua. They, of course, had to adjust their economic strategies to the new conditions, but, once that was accomplished, they discovered that the volcanic ash had certain properties which made it quite useful. In the first place, "corn would grow better on the cinder fields than on the alluvial slopes of the mountains, the place of earlier fields" (Colton 1960:4). By themselves, the cinders are "a poor medium for agriculture" (Pilles 1979:468). They often lack certain nutrients essential for the successful raising of crops. However, the cinders are loose and quite porous and, as such, make an excellent mulch that will absorb rainfall and snowmelt, assure a steady rate of water absorption, and inhibit the accumulation of standing water which is vulnerable to evaporation (Pilles 1979). When this mulch was spread in a thin layer (25-30 centimeters deep) over arable soils, it increased crop yields on extant fields and opened up new fields, which previously had not had enough water to make agriculture worthwhile. In addition, the cinders are almost exclusively black in color. As such, they are heat absorbent and might "permit growth by artificially lengthening the growing season" (Pilles 1979:468), a crucial consideration at such high altitude.

The improved agricultural conditions resulting from the eruption of Sunset Crater were enhanced, at least for a few decades, by improved ecological conditions. Pilles (1979:468) believes that "there is evidence for a period of above average rainfall between 1050 and 1130, accompanied by a warming trend". These conditions would be very helpful for an agriculturally
oriented society. Hevly et al. (1979) support Pilles' general conclusions in regards to the favorableness of the conditions for agriculture, but they believe that rainfall for this period actually decreased. However, this does not necessarily imply that agricultural conditions worsened. They state that, because what rain there was "was predominantly distributed in the mid- and late summer" (Hevly et al. 1979:504)—which is precisely when the maturing crops require an adequate supply of moisture—the possibility of a successful harvest actually increased during these decades. Whichever hypothesis is accepted, it appears that the ecological conditions in the early post-eruption era were nearly perfect for agriculture. This situation changed rapidly after A.D. 1150. DeBoer (1980:8) suggested that "the onset of a trend towards cool and dry conditions [which] probably made the entire Flagstaff region less suitable for agriculture". Kelley (1971) agrees with this argument. He states that "the optimum conditions interpreted by Hevly as existing in those few decades after the eruption could be described as a short term 'false spring', followed by a cooling trend with shortened growing seasons and a decrease in annual precipitation" (Kelley 1971:51-52). In addition to troubles with rainfall and temperature, the early agriculturalists were soon faced with problems with their cinder-mulched fields. The heavy winds of late spring blew the finer particles of ash off the fields and into large dunes where they were of no use to anyone (Colton 1960). The fields themselves, deprived of their cinder cover, were soon unusable for agriculture. Berlin et al. (1977) have demonstrated that the dual leaching process of free-flowing water and continuous
planting so damaged the Sinagua's fields that even after 700 years they still have not completely regained all of their nutrients.

As the above analysis suggests, the environmental conditions in the Flagstaff area changed greatly over time. The eruption of Sunset Crater and the trend towards cooler temperatures and less precipitation had a marked effect on the peoples living in the area. However, the presentation of this evidence should not be seen as a vote cast in support of the school of environmental causation. It seems to me that to invoke environmental factors as the prime movers in cultural change is overly simplistic. The ecology of a given area does dictate, to a certain extent, a group’s strategies, adaptations, and adjustments; but insisting that the environment caused a particular adaptation is naive. I do not wish to imply that the shifts in the ecology of the Flagstaff region were directly responsible for any of the cultural adaptations which the people of the area experimented with. The appearance of the proper amount of rain or of a high enough temperature to permit the cultivation of domestic crops is essential if agriculture is to be practiced by a given people. However, the mere appearance of the optimal conditions does not guarantee that agriculture will be adopted. If archaeologists want to understand a given cultural strategy (agriculture, human sacrifice, the growth of chiefdoms, population aggregation, etc.) then they must focus their attention on the political, economic, and social processes that were occurring in that particular society at that particular point in time. "The weakness of the
environmental explanations is that while they succeed in showing that a population must have been faced with a problem that had to be solved, just why a group chose one solution over another will remain mysterious until social, economic, political, and ideological factors are also considered" (Wilcox 1978:30). Ecological factors must always be kept in mind because of their ability to make any cultural strategy ineffective; but they should be viewed as constraining boundaries, not rigid guidelines. "Limitations as well as the potential of the environment must be viewed always in terms of the intervening variable in the human ecological system, that is, culture" (Binford 1972b:94).
CHAPTER 3
Introduction: The Beginnings of Agriculture

The first people to inhabit the Flagstaff region were very different from the modern Hopi. Archaeologists know very little about these preagricultural peoples. For the most part, their habitation and activity sites are small and ephemeral. Except for stone tools, they produced little which is preserved in the archaeological record. From these tools and other chance finds of well-preserved material, researchers have been able to determine that these people were hunters and gatherers, who travelled in small bands (probably kin groups), and who lived in seasonal shelters and small base-camps (Gilman 1987). These groups were highly mobile. Most movement was almost certainly related in one way or another to the quest for food. Even in good years, crops of such staples as pinyon nuts and juniper berries "are sporadic and exist only in widely separated localities" (Lightfoot 1979:320); and in bad years the people may have had to be constantly on the move in order to avoid exhausting the resources of any one area.
The adoption of agriculture brought about significant changes in the lives of the people of the Flagstaff region. "Procuring, preparing, and eating food crosscuts nearly all other domains of a culture including kinship, economy, law, religion and political organization" (Wetterstrom 1978:87). As a result, when the method of obtaining food, and even the food itself, changes, we can expect concurrent remodeling to occur in the rest of the culture's beliefs and behaviors. All researchers agree that the coming of agriculture triggered far-reaching changes; but there is considerable disagreement in regards to the motives behind the adoption of agriculture, the exact timing of the transition, and nature of the transition (i.e., a sudden shift versus a gradual shift). To put it another way, archaeologists agree that the transition was important, but they do not agree on when, why, and in what manner it happened.

The controversies regarding the date of introduction of maize (which is believed to be the first, and most important, crop) to the Southwest are the easiest of all of these debates to get a hold of. In the 1950s and early 1960s it was fashionable in anthropological circles to suggest that agriculture, in the form of maize, had arrived in the Southwest by 1000 B.C., if not several hundred years earlier. Data was presented from such sites as Bat Cave, the Arroyo Cuervo region, LoDaiSka Cave, and Cienega Creek to support this conclusion. This interpretation has been challenged recently by a new generation of researchers who have gone back and reexcavated some of the sites and reexamined the old data. They have concluded that "Bat Cave and its 'companion sites' individually and collectively comprise a
very weak body of evidence for early maize" (Berry 1985:296-297).
The data the earlier generation of scholars used to justify their
conclusions has been found to be riddled with problems and
inaccuracies. In particular, many of the dates which these
scholars used to support their theories have been called into
question. These dates were derived almost exclusively from
Carbon-14 samples, and most of the samples were collected and
analyzed in the period when this form of dating was still in its
infancy and when there still existed a great many misconceptions
in regards to the proper method of collecting and processing
samples. Many of the earliest dates have been found to be flawed
because of contaminated or poorly analyzed samples. Even the
dates which were obtained from samples collected with due regard
to the proper techniques have been challenged. Berry (1985) has
suggested that these remaining samples are invalid because their
association with the cultural materials they were supposed to
place in time was extremely tenuous. This lack of acceptable
early dates or reliable early contexts for maize in the Southwest
has led Berry to conclude that "maize did not enter the Southwest
until a few hundred years B.C." (Berry 1985:304). He believes
that, at the earliest, maize cultivation arrived in this part of
the continent between 500-700 B.C.

While the timing of the transition seems to be fairly clear-
cut, the information archaeologists have regarding the reason for
the shift to maize cultivation and the exact nature of the change
is certainly open to many interpretations. Anthropologists have
proposed two basic theories to explain why the prehistoric
people's of the Southwest adopted horticulture. The first of these theories, and one which has enjoyed a great deal of popularity, cites population pressure as the factor which eventually forced the people to take up agriculture. Under this theory, it is assumed that "a population will tend to keep reproducing and growing in size until an ultimate limit is reached which is determined by the supply of nutrients and energy" (Zubrow 1971:128). A population which has reached the limits of its surrounding system and stopped growing is said to be in a state of equilibrium. However, if the conditions affecting a given people's livelihood should suddenly change for the worse, then the population would be under a good deal of stress. The scholars who support the population pressure theory suggest that it is this stress, brought on by a population which is suddenly much too large for its ecosystem to support, which forced people to find some method of increasing production. This method, they suggest, was agriculture.

Many researchers have challenged the Malthusian assumptions held by the advocates of the population pressure theory. In the first place, it has been noted that population growth is not a preordained event. Hassan argues convincingly for the theory that "population controls were exercised by prehistoric populations" (Hassan 1981:143). He presents both archaeological and ethnographic evidence which strongly suggests that hunter-gatherer groups are well aware of the possibilities and problems inherent in population growth, and will only permit such an expansion if it ties in with their cultural beliefs and values. If it does not, they are able, through a variety of means
(fertility controls, mortality controls, population mobility), to maintain population levels within an acceptable range. Hassan's data suggest that not only is population growth controlled by cultural prescriptions and values, but that, if we are to truly understand the process by which agriculture came to be the dominant subsistence strategy in many areas of the world, we must examine the opinions and assumptions of the people of those regions.

Hassan suggests that pre-agricultural peoples attempt to maintain their population level not at the maximum carrying capacity of the land, as Zubrow has proposed, but rather at what he refers to as an "optimum carrying capacity". The optimum carrying capacity is a boundary line which each culture sets at a slightly different point on the population-to-resources ratio, and which enables the people within that population to avoid "the relative scarcity of choice food items, an increase in the work load per producer, or the need to travel further or schedule [their] subsistence activities differently" (Hassan 1981:170). In other words, stress is not an objective phenomenon. Instead, it is a culturally defined sensation. Each society determines for itself what an acceptable level of stress is, and then leaves itself a buffer against environmental fluctuation such that a change in ecological conditions will not necessarily result in the need for radically new or innovative strategies of production.

Given the above information, I believe that "population pressure cannot be regarded as a sufficient cause of culture
change" (Hassan 1981:163). Population growth occurs within a cultural context and is a symptom of changing cultural values and behaviors. If growth occurs, it occurs because people permit it to happen. If a given group of people permit their population to expand, then scholars must examine their reasons for doing this; and if the same group of people adopts agriculture as a means for coping with the increased demands for a reliable food crop then this innovation must be regarded as something which was inextricably linked with the original decision. They surely knew that an increase in population would have drastic effects on their economic system. They would not make such a commitment without the knowledge that it was possible to feed these new people. After all, why would they want to place themselves and their dependents at risk? Why would they want children they could not provide for? Changes in the demographic make-up of a society do not occur in a vacuum. Invoking population growth as the causal factor in the appearance of agriculture ignores the importance of cultural definitions of what is an optimum population and what is a stressful situation. Yet it is exactly these factors which anthropologists have to account for. It is always easier to invoke arbitrary limits and formulas, but researchers must not ignore the emic perspective or the insights it brings us. "Perhaps the most difficult task [anthropologists] face is that of considering conditions as they must have appeared to hunter-gatherers who were actually in the process of intensifying their food-getting behavior" (Gould 1985:433), but they must not let the difficulty of the task dissuade them from attempting to do just that.
In the place of population pressure as the causal factor in the adoption of agriculture, I suggest that the shift be understood as an opportunistic choice that was made by many different societies at many different times and for many different reasons. It is important to realize that the adoption of agriculture by hunter-gatherers probably did not involve a great increase in knowledge or skills for these people. There was, in all likelihood, no moment of epiphany involved in the transition from foraging to farming. As Cohen has pointed out, "any human group dependent in some degree on plant materials ... will be almost bound to observe the basic processes by which a seed or a shoot becomes a plant" (Cohen 1977:22-23). Not only are they aware of the growth cycle of their local flora, but many groups also engage in behaviors which are almost identical to those used in agricultural societies. "Agriculture is a combination of behaviors", and "all of them have been demonstrated ..., inadvertently, or purposefully, by non-agricultural groups" (Cohen 1977:23). In addition to possessing the experience and talents necessary for the practice of agriculture, many non-agriculturalists have existed side-by-side with farmers from another society for centuries. These people have long been aware of the existence of agriculture as a viable option. "It is therefore not ignorance but rather lack of need that prevents some groups of people from becoming agriculturalists" (Cohen 1977:15). Or, to put it another way, "man did not need education as much as he needed motivation" (Cohen 1977:9).
Given that people were aware of the existence of agriculture and of the basic techniques needed to survive as nascent horticulturalists, and given that human populations are, in general, able to control their rate of growth by various cultural methods, it appears that population pressure could not possibly have caused the widespread adoption of agriculture. People took up agriculture and increased their population because they felt that it was advantageous for them to do so, not because they were coerced into doing so by biological and economic forces beyond their understanding or control. This interpretation is supported by the very nature of the transition in the Southwest. Berry (1985) believes the shift to agriculture as the dominant economic strategy in the region occurred very quickly. He notes that "there is a rapid, perhaps immediate, increase in the numbers of dated cultural events coincident with the probable inception of maize farming" (Berry 1985:304). Because of this, he believes that "the transition was clearly abrupt and the immediate impact was profound" (Berry 1985:304).

If Berry is correct in asserting that the conversion to agriculture was accomplished quickly then this would suggest that the population pressure theorists were correct after all. He suggests exactly the same thing they do: that a population under a great deal of demographic stress took up agriculture as a means to relieve some of the burdens they were experiencing. Agriculture, in turn, permitted them to expand their population to an even greater degree, and the whole cycle was repeated again and again. However, Berry's theory has several flaws in it which lead me to believe that the nature of the transition was not
rapid at all, but rather very, very slow. In fact, to speak of a transition is, in all likelihood, a distortion of the events of the past. Only their great distance from that era allows anthropologists to view it as an essentially synchronic incident instead of the diachronic process it must certainly have been. Instead of being a sudden and dramatic happening, "the initial introduction of domesticated plants into the Southwest was a monumental nonevent with little immediate impact on native human populations" (emphasis in the original of Minnis 1985a:310).

The main problem with Berry's argument is that he uses his archaeological data uncritically. He assumes that, because anthropologists have evidence for an increase in the number of sites following the definite appearance of maize in the archaeological record, they must be witnessing a population explosion. However, he fails to realize that the methods employed by archaeologists for recognizing sites are "essentially designed for sedentary sites" and "can be applied to nomadic groups only with great care, if, in fact, it can be applied at all" (Cohen 1977:75). This problem is crucial when dealing with the agricultural transition because farming is usually associated with sedentism, and it is these sites which are more likely to be found by archaeologists. The comparatively ephemeral sites of nomadic peoples are often missed entirely. As a result, "we are left with the impression of a population explosion accompanying the development of agriculture, but this may result from nothing more than the preferential preservation and discovery or agricultural villages" (Cohen 1977:76).
The difficulty archaeologists have in recognizing non-agricultural sites is not necessarily reduced with the initial introduction of agriculture. Ford (1985) has suggested that there are many different methods of cultivation: tending, tilling, transplanting, sowing of seeds, domestication, and plant breeding. Most of these strategies, while effective in increasing plant yield, are not visible in the archaeological record. For example, tending, which Ford defines as encouraging growth by weeding or pruning, "is such a casual activity that it leaves no material correlates and the response from the plant is either a quantitative increase in yield or a prolonged presence in a particular locality, neither of which are discernible by archaeological methods" (Ford 1985:4). It is not until people start genetically altering their crops and producing non-biodegradable tools (Ford believes this does not happen until the domestication stage) that we can definitely discern evidence for agricultural activities.

Agriculture, then, may have existed in some modified form well before the "explosion" that Berry cites. For these modified agriculturalists, "agriculture may have represented an efficient and inexpensive buffer against the failure of important naturally available foodstuffs" (Minnis 1985a:316). Limited farming could have been easily incorporated into the social structure of the Archaic societies; and "the location of farming sites and the seasonal timing of cultivation labor requirements probably fit well into already existing patterns of resource exploitation" (Minnis 1985a:337). Farming, then, was an activity which could
provide a more secure food supply, and which, at the same time, fit well into traditional patterns of social organization. Intensification occurred only slowly, and Minnis (1985a) believes that dependency did not set in until sometime between A.D. 200 and 700. Even at this time, the people of the Southwest continued to rely on gathering and hunting for a large percentage of their food.
Sometime around the birth of Christ semi-sedentary villages emerged in the Southwest (Cordell and Plog 1979). In the Flagstaff area, these small groupings of people probably coalesced a bit later than this, around A.D. 200. By A.D. 500, small villages dotted the landscape around the San Francisco peaks. These settlements are the ancestors of the larger, more complex villages which this investigation is focused on, and, as such, a basic understanding of what life was like for the people who occupied them is important for understanding the future development of Sinagua culture. As I have already suggested, the Sinagua depended on an economic system based on "extensive hunting and gathering buffered by corn for storage" (Cordell and Plog 1979:415). Mobility continued to play a large role in their lives. The early villages are "located in areas from which the resources of two environmental zones could be most easily exploited" (Pilles 1979:463). People moved back and forth between zones easily, and it is even possible that they practiced a bi-seasonal settlement pattern, in which they concentrated their summer activities in the higher areas and spent the winters in the lower, warmer zones (Gilman 1987). Under this system.
fields could be planted in the spring and then tended only sporadically while the people focused their energies on gathering and hunting. The products of the gathering and hunting expeditions and the harvested crops could then be brought to some central location where they could be stored for consumption during the winter months.

While the above patterns seem to be very similar to what has been described as typical for pre-agricultural times, there were several significant technological and social developments during this period. In terms of technology, agricultural tools (hoes, digging implements, etc.) begin to appear in significant numbers during this time. In addition, "investment in the construction of storage facilities increased" (Cordell and Plog 1979:414). As I mentioned above, Gilman (1987) believes that the ability to store food was crucial to the people's ability to maintain a bimo modal settlement pattern. These storage features have two basic forms: pits and ceramic containers. Villages depended on these items to keep their supplies dry and away from rodents and insects. It is hard to determine exactly how numerous these features were. Many have been overlooked in excavations because they are located away from the residential structures, and it is often impossible to determine whether a given ceramic sherd was once part of a storage jar or of some other ceramic object which was not directly connected to storage. However, Colton (1946) has presented a good deal of evidence which suggests that most sites from this period contained several storage pits and a large number of jars. One site, N.A. 1293, contained six storage cysts 2-3 meters in diameter; and another, N.A. 1959, had seven whole
(and an undefined number of broken) ceramic vessels suitable for storing foodstuffs (Colton 1946).

In addition to innovations in production and storage technology, a recognizable style of architecture emerged during this period - the pithouse. There are many different styles of pithouses, and there are recognizable differences between early and late pithouses (see below). However, pithouses are, in general, semi-subterranean dwellings, which are roughly circular, and which were covered of logs, saplings, branches, and daub. Almost without exception, these structures contain a recognizable hearth or firepit, and there are often storage pits in the floor or in the walls. Entrance was gained either by a ladder stretching through a whole in the roof or by a sloped, ramplike entranceway, which invariably faced to the east. Given the amount of work that went into the construction of a pithouse, and the ubiquitous presence of household artifacts and hearths, it has been assumed that these structures functioned as houses, at least for part of the year.

The other type of structure which has been attributed to this time period (and which was used throughout the prehistoric era) is the fieldhouse. In general, a fieldhouse was a very ephemeral structure. It usually consisted of a basal course of rocks (which is all we find now), topped by a brush superstructure. Structures very similar to this are still being used by modern Pueblo societies (Ellis 1978). There is some evidence which suggests that various types of household activities took place in the fieldhouses (e.g., flintknapping,
processing food), but the variety of behaviors attributed to the fieldhouses never approaches that found in pithouses (Pilles 1978). This evidence has led researchers to conclude that fieldhouses were occupied only seasonally, and that their main function was to provide people with shelter while they exploited areas and/or agricultural fields which were removed from their pithouses. In addition to the above evidence, Pilles (1978:122) found that only six out of thirty-two fieldhouses had "fire features", and Ward (1978) found no indication of the prolonged storage of food at his fieldhouse site. Both of these facts strongly suggest that fieldhouses were utilized only seasonally, and that they functioned as a way to funnel different types of food back into the main settlement for storage and eventual consumption.

During this time period the general settlement pattern "appears to have been suited to a diversified subsistence pattern, with locations of base camps representing a compromise among demands for access to varied resources" (Matson and Lipe 1978:5). In many ways this pattern is very similar to that which must have existed before the beginnings of agriculture. However, along with new technologies and architectural styles came a change in the basic structure of the population. Larger and more permanent groupings of people began to appear on the landscape. Families were no longer living solely in isolated pithouses. More and more people had gathered together into multi-family groups. Wilcox (1986) has divided these three new settlement into several categories. He suggests that: a grouping of 4-6 pithouses be called a "large farmstead"; a grouping of 1-3
pithouses be called a "small farmstead"; and we should maintain the category of fieldhouse and/or artifact scatter for the smallest of sites (Wilcox 1986:112). In addition he believes that, eventually, we will be able to find groupings of 9-15 pithouses, which he proposes to call a "hamlet". Colton (1946) has demonstrated that there were many sites from the first three categories in the Flagstaff area during this time. Hamlets seem to appear somewhat later in time, but they are definitely in existence by A.D. 1000, and they may have appeared several hundred years earlier. Wilcox's classifications seem to me to be quite useful. They provide a meaningful method of categorizing the behavioral and social patterns of this time. I will make use of these terms throughout the paper.

Within the new settlements themselves, much remained the same in people's everyday lives. Diversity remained the cornerstone of their economic strategy. Farmsteads tended to be located near agricultural fields (Pilles 1979), but hunting (Colton 1946) and gathering (Hevly et al. 1979) retained their importance. In addition, the production of ceramics and stone tools continued to consume much of their time. However, the appearance of larger groups of people permitted several changes to occur in the patterns of their economic activities. Communal projects (on a small scale) were possible for the first time, and people were able to rely on their neighbors for assistance in times of trouble. The reciprocal exchange of food and other goods was a viable alternative now that people lived closer together. This increase in inter-personal contact provided the
Sinagua with an additional buffer against environmental catastrophe. "In an egalitarian society living in an effective environment with unpredictable and potentially disastrous fluctuations of biotic and abiotic variables, reciprocity and ritual will regulate the circulation of nutrients for the survival of the human populations" (Ford 1972:3).

There is some evidence that the development of more complex intra-village relationships was paralleled by the emergence of a system of slightly more rigid inter-village relations. Pilles believes that "the distribution and nature of sites suggests that there was some sort of community organization" during this period (Pilles 1979:463). The larger pithouse villages became, he believes, "important centers" for inter-community ritual and, possibly, trade. He notes that the larger sites tend to be located centrally between smaller sites, and that these sites seem to have been located where they would be able to control much of the area's prime farmland. Smaller farmsteads tend to be located further away from arable land. In addition, "large pre-eruptive structures apparently associated with ceremonial and intercommunity activities have been identified" (Pilles 1979:461); and these are consistently located in close proximity to the larger farmsteads. Pilles believes that we can recognize communities of sites, which are bounded by "natural geographical features such as washes or ridge lines" (Pilles 1979: 463). This interpretation has been supported by Wilcox (1986), who has noted that, while the Sinagua may have changed the location of their sites fairly frequently, they tended to do so within a very limited range (1-3 km).
Within a given region, then, there may have been several of these small inter-village organizations. Within a given community, the farmsteads would have been linked by marriage (exogamy would be required in such small villages), ritual, and trade. Exactly how complex the Sinagua inter-community social structure was during this early period is still, to my mind, very much an open question. Lightfoot and Feinman, although concentrating on an area well to the south and east of the Flagstaff area, believe "social differentiation and specialized decision making were present in parts of the Southwest by at least A.D. 600" (Lightfoot and Feinman 1982:80). While this may or not be true for the Mogollon region (Schiffer, 1983, argues convincingly that Lightfoot and Feinman misrepresented their data), it seems to place too great an emphasis on the rise of an elite class to conform to the information that is available for the Flagstaff area. Crumley (1979) suggests that researchers should not view the possibilities as being polar opposites: ranked vs. unranked. Rather, she suggests that they should emphasize the range of possibilities available between these two end-markers. Granted, there will always be a hierarchical pole, in which some elements in a system are subordinate to others; but, she suggests, researchers will be hard pressed to find a truly unranked society. Instead, she believes they should emphasize the "heterarchical" nature of many societies. Within a heterarchical system, "each element possesses the potential of being unranked ... or ranked in a number of ways, depending on systemic requirements" (Crumley 1979:144). This seems to me to
be an excellent way to describe the Sinagua’s early social structure. There was certainly some ranking going on, but what there was of it was not overly rigid. A loose system of stratification between settlements could certainly exist without necessitating the emergence of a recognized class of elites. Hohmann’s (1982) work on pre-eruptive mortuary data supports the conclusion that there was little or no social differentiation among the Sinagua at this time.

What has been presented in the last few pages should be seen as nothing more than a general cultural history of the Flagstaff region in the years before the eruption of Sunset Crater. I have made little effort to place this information in a strict temporal context or to describe the changes that took place in this system between A.D. 1 and the eruption. Instead I have attempted to provide some background information on this area and its early inhabitants. I will now supply a temporal context for some of the developments I have been discussing.

Archaeologists in the Southwest have, almost from the beginnings of excavations in the area, attempted to place the cultures that they have examined onto a time-line. Once the researchers have the beginning and end points, they have attempted to divide the time-line into neat little blocks of time, which, they believe, correspond to recognizable episodes in that culture’s development. Each segment is called a phase or a focus. So, for example, in the case of the Anasazi, the previous generation of archaeologists were confronted with the terms Basketmaker I, Basketmaker II, Basketmaker III, Pueblo I, Pueblo II, Pueblo III, and Pueblo IV, each referring to a certain period.
of time and, presumably, to a certain stage in that culture’s
development. The Flagstaff area is no different from the rest of
the Southwest in this respect. The phases, as they are currently
defined, in the Flagstaff area are: Cinder Park (A.D. 600-700),
Sunset (700-900), Rio de Flag (900-1065), Angell-Winona (1065-
1110), Padre (1110-1150), Elden (1150-1300), and Turkey Hill
(1300-1400). These phase names are used throughout this paper.

Harold Colton did the original work in setting up the phase
designations (although he referred to them as foci). He believed
that it was possible to define phases by making a "combined study
of tree-rings from the beam material and pottery from the site"
(Colton 1946:258). He recognized that ceramics vary widely in
terms of color, design elements, firing technique, types of
temper used, etc. By coordinating the changes in ceramic
manufacture with absolute dendrochronologic dates, he believed
that he could define the phases. Other variations in cultural
objects (houses, hearths, projectile points, etc.) could then be
plugged into the proposed phase designations, and, in this way,
he could form a relatively accurate picture of when changes
occurred in the Sinagua culture. Once this process was completed,
any Sinagua site which contained the proper material elements
could be "confidently" classified as belonging to a particular
phase. Colton’s classifications have worked fairly well over
time. They have aided archaeologists in establishing
chronologies and inter-site relationships, and, for this reason,
I will make use of them in this paper. However, it is important
to recognize that there are some serious problems inherent
in using these terms. In the first place, "the concept of 200-year-long stages tends to have nearly sacred status in the Southwest" (Plog 1983:292). Archaeologists have taken the idea of a phase and reified it. Instead of trying to determine if the phase designations match the data, many people have assumed that the categories are correct and have attempted to shoe-horn the data into them. As a result, a site which has slightly more Cinder Park phase sherds than Sunset phase sherds will be classified as a Cinder Park phase site, and it will be assumed to have all the attributes of a site of that phase, even if those characteristics are not readily apparent.

In addition to making it easy to mis-interpret or under-analyze data, the phase classifications "are typically arbitrary temporal concepts which obscure the diachronic variability inherent in the archaeological record" (Plog 1975:98). Change is recognized to have occurred between phases, but tends to be obscured or ignored if it happens to occur within a given phase. Phases are normative constructions and, as such, tend to diminish our capacity to recognize and explain variability (Upham 1984). This is tragic. Archaeologists must concern themselves with the changes that are only visible over a great stretch of time. Phases prevent this by setting up a situation in which variation "within categories is slight, while variability between categories is substantial" (Plog 1974:44).

In this paper I concentrate on cultural behaviors and variables "that must be measured continuously, not categorically" (Plog 1983:294). It makes no sense to try to explain differences in social structure and group size in terms of differences
between arbitrary segments of time. If these variables are to be understood, then they must be traced continuously through time, not analyzed in four or five discrete sections. Much of this chapter has been, and the rest of the paper will be, concerned with doing just that. However, because this section is intended to serve only as background information, I will use phase designations to provide a temporal context for the information that has been discussed above.

Cinder Park phase sites are made up exclusively of pithouses and fieldhouses. For the most part, the sites consist of either isolated pithouses or clusters of 2-3 structures (McCormack n.d.). The pithouse floors tend to be found about 75 centimeters below the original (i.e., prehistoric) ground level. They were typically round or rectangular with rounded corners, and they tended to be fairly large. Pithouses from this phase have long sloping entrances on the east side, timber-lined walls, a roof of poles and mud, and a central fire pit. The dominant ceramic type on these sites is Alameda Brown Ware (Colton 1946). As is the case for all of the pre-eruption phases, information on Cinder Park sites is hard to come by. Few sites have been located, and even fewer fully excavated. Colton believes that, because of the cinder cover, "the sites are hard to find, but they are probably more abundant than the number catalogued in the [surveys] indicates" (Colton 1946:247). Along a similar line, Wilcox (personal communication) has noted that, even after a site is found, it is often very difficult to determine the exact number of structures present. Given this, he believes that it is
probably a good idea to assume that the actual number of pithouses in a given site is at least twice as great as the original survey data suggested.

The change in material culture which marks the transition from the Cinder Park phase to the Sunset phase is not very dramatic. There is a shift in the dominant ceramic type and a four-post support system came into use in many pithouses, but besides these slight modifications there was very little in the way of major transformations. The settlement pattern seems to have remained basically the same (McCormack n.d.), and the pithouses retained their timber linings, central fire pits, and sloping entranceways (Colton 1946). What changes there were in the Flagstaff area before 1066 occurred in the Rio de Flag phase. Although Pilles (1979:460-461) has stated that the Rio de Flag, Sunset, and Cinder Park phases "appear to have been fairly uniform relative to ceramics, architectural styles, settlement plans, and subsistence strategies", I believe that the years 900 to 1065 witnessed several marked breaks with past traditions. The changes may not seem dramatic, but they were the forerunners of events which will be the focus of the next chapter and so must be discussed.

In the first place there seems to have been, Pilles's argument notwithstanding, a transformation in settlement patterns during this phase. Pilles himself (1979:463) acknowledges that there was a discernible change in both the elevations and the locations that were occupied by the Sinagua during this time. Warmer, drier conditions made the upper elevations, with their better rainfall and slightly cooler temperatures, seem more
attractive to the Sinagua; and many people relocated to the flanks of Mount Elden and the San Francisco Peaks. The pattern of settlement for these areas was very similar to what has already described for the Cinder Park and Sunset phases, with farmsteads containing 1 or 2 pithouses dominating the landscape. However, there seems to have been a larger number of pithouse villages. "Isolated pithouse residences are scattered among the larger habitation sites which have two to six structures each" (Madsen 1982:13). Fieldhouses and artifact scatters dating to this phase are common. In addition to the increase in the number of small villages present in the area, the Rio de Flag phase also witnessed the introduction of several previously unknown architectural styles. The deep timber-lined pithouse remained the most common structure, and it retained its four post support system and central fire pit; but the sloping entranceway to the east was replaced by a ventilator shaft. Entrance was now gained by climbing down a ladder from a hole in the roof. In addition, the Sinagua no longer lived solely in pithouses. To the south of the peaks, platform houses appeared in areas which tended to become boggy in the spring. These structures take their name form the fact that they were constructed on raised (20-30 centimeters) mounds. They were made of timber, brush, and mud, with a basal course of stones. Many of these structures have an "alcove" on the south side. The final architectural innovation of the period was the emergence of surface rectangular granaries with low masonry walls (Colton 1946). These may have existed in earlier phases, but they are first found in significant numbers.
during the Rio de Flag period.

Besides the beginnings of a new settlement pattern and the emergence of several new architectural styles, this period also witnessed the appearance of recognizable ceremonial architecture. The most notable type of ceremonial structure that appeared during the Rio de Flag phase was the ball court. The ball courts which are found in the Flagstaff area are very similar to those which have been described for the Hohokam culture in the Salt River Valley. Little is known about the game that was played in them, but it is assumed to have had a socio-ceremonial significance for both the participants and the spectators. The location of these courts is often in the center of a scattered group of pithouses, suggesting that they may have served as a focal point for social and religious activities for a region (Madsen 1982). In addition, a meeting place such as this may have been used by the locals to exchange or redistribute certain goods and services. By using the courts in this way, the Sinagua could have broadened their resource base and reduced the risk of famine. The interdependence that would emerge from such a practice would serve to tie the people involved to each other.

Glassow (1977:206) believes that what aggregation there was during this period "arose as a result of the economic interdependence between householders (and larger social segments)", and that this interdependence may have been attractive to the people because of "the variability of crop yields from year to year".

Ball courts were not the only ceremonial structures present during this phase. Community rooms and kivas have also been
attributed to this period of Sinagua prehistory. Structures such as these have been found in earlier contexts (Pilles [1979:461] refers to a Cinder Park phase Great Kiva that is 8.5 meters in diameter), but they may become more numerous during the Rio de Flag phase. It is hard to determine if these structures served any integrative purpose during this phase because they "are found at both small and large sites and on occasion as isolated structures" (Madsen 1982:15). Part of this confusion certainly stems from the difficulty inherent in attempting to define a structure as a "community room" or a "kiva". There are no hard and fast definitions for determining whether a researcher has an unusually large pithouse or a kiva on his/her hands; and, as a result, archaeologists have surely labelled some pithouses as ceremonial rooms and some ceremonial rooms as pithouses. However, even though the data base has its problems, it does seem to confirm the pattern, noted above, of sites clustering around slightly larger sites or ball courts. The location of both the ball courts and the community rooms/kivas, and their relation to neighboring sites, gives me the impression that the household units were "organized around centers with community architecture" (Fish, Pilles, and Fish, quoted in Madsen 1982:13). What inter-community organization there was during this phase was certainly very loose, and I do not wish to imply that the Sinagua of this period were controlled by a centralized hierarchy of elites, or even by overly powerful chiefs. However, the available evidence does suggest that the Rio de Flag phase did witness the beginnings of some sort of community organization; and it may
well be that this nascent intra-regional system was the forebears of the more complex systems that will be the focus of chapter four.
CHAPTER 4

Flagstaff Area, A.D. 1066-1110

Sunset Crater erupted in 1065 and, although "subsequent events ... occurred episodically from about A.D. 1150 to 1250" (Wilcox 1986:94), it was this event which essentially created the Flagstaff area as it is today. The appearance of cinder fields, lava flows, and basaltic extrusions presented the Sinagua with both problems and opportunities. What is striking about their adaptation, however, is not that the eruption of Sunset Crater ushered in a new era in Sinagua culture, but rather that their style of living remained remarkably similar to that which had existed in pre-eruption times. The period spanning the years 1066-1110 (which incorporates all of the Angell-Winona phase and the first half of the Padre phase) should be seen as a time of relative stability. There were some changes, to be sure, and I will address these below; but, in general, "the traditional allocation of work space and living arrangements dating from the Rio de Flag phase were maintained in the [Angell-Winona phase], only to be significantly transformed in the Padre phase" (Wilcox
The settlement pattern in the Flagstaff area changed slightly during this time period, although much of this change is in line with the patterns observed in the Rio de Flag phase. As in the previous phase, isolated pithouses became less and less frequent, and their place was increasingly taken by pithouse villages containing 2-6 structures. However, the interrelationships between the different villages seems to have been changing during this time period. "The relative location of villages of two to six pithouses appears to have been more aggregated than in previous phases" (Madsen 1982:17). A good example of this trend towards increased inter-farmstead interaction is the Winona site, which contains at least two (Madsen 1982), and possibly as many as four (Wilcox 1986), clusters of pithouses datable to this phase. Each separate cluster contains from one to four pithouses. These clusters are all within a kilometer of the Winona ballcourt, which was constructed during this phase (Wilcox 1986). In addition to these pithouse villages, "pueblo-like structures with two to four rooms have been recorded for this phase" (Madsen 1982:17). These appear relatively late in the sequence and, in all likelihood, were not a major factor in the lives of the Sinagua during this period. Finally, both DeBoer (1980) and Madsen have documented "a tremendous increase in field houses" during this period (Madsen 1982:18). These fieldhouses are often near larger settlements and Wilcox (1986) has suggested that these hamlets may have exercised social and political control over these spatially associated fieldhouses and farmsteads. "A hamlet-
farmstead—temporary camp association may have partitioned the neighborhood into a contiguous series of territories", each of which was a separate social and political entity; and "each of which encompassed a maximum amount of biological diversity" (Wilcox 1986:112).

The locations of these sites also underwent a change during this time. In general, there was an expansion into areas in the pinyon—juniper zone below 2070 meters. The areas above 2070 meters were still used, but less intensively (Madsen 1982). Climatic conditions (DeBoer 1980) made the lower areas seem more attractive, and the sudden appearance of thousands of acres of cinder fields increased the allure of those areas. However, it is important not to over-estimate the influence the volcanic ash had on the Sinaguan settlement pattern. While the Sinagua did settle in areas which were near or on cinder fields, it is quite possible that the cinders were less important to them than were the presence of "washes and the availability of arable land" (Pilles 1979:469). Madsen (1982) has found that habitation sites tend to be distributed along the edges of open basins and small washes. This conclusion is supported by Wood's data from the Little Colorado area. He found that 100% of all habitation sites and 91.7% of all limited activity sites occur within one kilometer of arable land (Wood 1978:156). This suggests that fieldhouses tended to have agricultural functions during this period, although Catlin's data (1986) from the Black Mesa region does not fit this pattern.

As the above data suggest, agriculture probably became
increasingly important in the Sinagua's subsistence strategies after the eruption. The Sinagua's settlement pattern is very similar to "the diversified settlement strategies that frequently accompany the conduct of agriculture in marginal environmental settings" (Sullivan 1984:96). Mobility remained quite important to the Sinagua. The presence of a large number of fieldhouses "may indicate a rapid change in the selection of areas for cultivation" (Pilles 1969:101). Certain settlements remained in one place of course, but, while "the ecological niche of hamlets was quite stable, ... farmsteads and temporary camp locations apparently shifted to cope with changes in the length of the growing season" (Wilcox 1986:112) and decreasing soil fertility. The frequent movement of the smaller sites would also have increased the efficiency of the Sinagua's efforts at hunting and gathering. We know from pollen studies (Hevly et al. 1979) that gathered materials remained an important part of their subsistence strategy during this time. The fieldhouses must certainly have facilitated the collection and processing of wild resources, both within a given zone and between several zones.

The basic unit of social organization during this time period was almost certainly a domestic group composed of members of an extended family. "A domestic group is behaviorally defined as a minimal, localized residential group principally responsible for performing its own subsistence and maintenance activities" (DeGarmo 1977:158). The family organized its activities around the growing season, of which the principal events were the planting and the harvest. As Bronitsky notes for the pueblo of Arroyo Hondo, "agriculture was becoming sufficiently important
through time to necessitate rescheduling of other activities to times of nonagriculture activity" (Bronitsky 1979:227). Limited hunting and gathering may have occurred in conjunction with everyday agricultural tasks, and more ambitious expeditions may have been undertaken during the late fall and winter. The production of tools was almost certainly a wintertime activity, as is the case in modern pueblos.

In smaller settlements there was probably little in the way of an authority figure or organized social structure above the level of the individual family. In the hamlets, however, there may have been a slightly more complex system of organization. Hohmann (1982) believes that these hamlets were divided along lines very similar to moieties. He cites two pieces of evidence as support for this conclusion. In the first place, he notes (Hohmann 1982:39) that the large Angel-Winona phase and early Padre phase sites often contain two large "community rooms", one on the east side of the settlement and one on the west. Secondly, Hohmann has found that the Sinagua of this period practiced two different methods of burial: cremation and inhumation. These differences in burial practices do not, he believes, represent differences in rank or status because the grave goods associated with the two styles are almost identical. They may, however, reflect moiety preference. Hohmann's data indicates that cremations and inhumations are found in almost equal numbers, and that cremations tend to occur on the east side of sites, while inhumations are usually found on the west. This division parallels the placement of the community rooms. While
Hohmann's data is admittedly inconclusive, it does suggest that there were recognizable spatial and mortuary divisions within the larger Sinaguan communities. This, in turn, may indicate the existence of a moiety-like system of social organization.

The appearance of moiety-like divisions in the larger communities was probably accompanied by changes in the sociopolitical organization of these settlements. Hohmann (1982) believes that this period in the Sinaguan cultural sequence witnessed an increase in social differentiation. The mortuary data he presents from this period suggests that the hamlets contained several individuals who were accorded a significantly higher status than were their contemporaries. These individuals' graves required more energy to construct, and their grave offerings were more elaborate than those of their peers. However, the mere appearance of social differentiation does not necessarily imply that these communities were highly stratified. Differentiation, Hohmann notes, "indicates differences but not specific, structured social divisions, whereas stratification ... implies a highly structured system" (Hohmann 1982:12). The fact that all known examples of high-status burials are those of elderly men, and that 75% of all of the offerings in these burials are believed to be religious objects, suggests that the Sinaguan system of this time was based on achieved, rather than ascribed, status (Hohmann 1982). The system was not highly stratified, and a high position within the community was something which was earned, rather than being the birth-right of a particular family or individual. The men who Hohmann identifies as high-status individuals were probably essentially
"religious leaders" (Hohmann 1982:42), who were the spiritual descendants of the religious practitioners of earlier phases, and whose secular powers were extremely limited.

According to Hohmann, "The Angel-Winona phase Sinagua practiced a limited stratified form of social organization ... where elder males could attain high status through an achieved ranking system" (Hohmann 1982:45). This system held sway in this area until the latter half of the Padre phase. The men who were able to attain a high status in their own hamlet probably played a role in integrating the neighboring settlements into a cohesive social and economic system. I have already discussed the idea that smaller farmsteads and fieldhouses seem to have been part of a larger settlement system focused on a large farmstead or a hamlet. The hamlet may have provided the outlying settlements with religious and social services, and in this the religious elites of the larger communities would have led the way. It is even possible, although I have seen no evidence for it, that the inhabitants of the smaller settlements were incorporated into their hamlet's moiety system. In addition to these local ties between settlements, it is quite likely that the settlement systems themselves were tied together by socio-religious and economic connections in which the elites may have led the way. The ball court remained a major feature in Sinagua culture during this period. At least six courts were in use during this phase (Kelley 1963, Madsen 1982, Stanislawski 1963, Colton 1946), and there may have been several more. The possible functions a ball court may serve for a local settlement system have already been
discussed. It is enough for me to note here that the courts "probably contributed to intra- and inter-village social and religious integration" (Stanislawski 1963:524) by providing the Sinagua with a place where they could conduct religious, social, economic, or political business. Interestingly, Kelley (1963:110) presents evidence that the courts of this time may themselves have been grouped into two distinct clusters, each containing three courts. Within the cluster, the ball courts are only 10-15 kilometers from each other; but the clusters themselves are 60 kilometers apart. This may suggest a slightly more advanced form of inter-village organization, but more data are needed before this can confidently be claimed. In addition to the ball courts, the community rooms that Hohmann cited may have provided a place for inter-village meetings or rituals; and inter-village exchange, on a formal or informal level, may have brought the people of different settlement systems together on a fairly regular basis. The level of integration between settlements was probably greater during this period than it had ever been, but this should not be read to mean that the Sinagua were a highly organized society at this time. The loose pattern which characterized their intra-settlement relationships extended to their inter-regional associations.
Flagstaff Area, A.D. 1110-1150: Time of Changes

The forty-year period between A.D. 1110 and 1150 marks the end of the Sinagua's pre-eruption way of life. Their earlier lifestyle had, of course, undergone some modification following the eruption of Sunset Crater, but it is in the late Padre and early Elden phases that the pace of change accelerated dramatically. By 1150, their social, economic, and political systems were radically different from what had existed only two hundred years before.

The patterns of change in the Sinaguan settlement system that were described earlier were carried into this time period. Site densities continued to increase. Where the maximum number of sites per square mile had once been 25, it now climbed as high as 40 (Madsen 1982). The nature of these sites changed as well. Field houses and artifact scatters remained numerous (DeBoer 1980); but the "small pithouse tradition began to decline and in many instances was replaced by sites that had both pithouses and pueblos" (Madsen 1982:20). These sites tended to be a good deal larger than the smaller hamlets and villages that I discussed in the previous section; and the increased presence of above ground masonry room-blocks suggests that the Sinagua were not only living in larger groups but in much more centralized villages as well. A site such as AR-03-04-02-1777 (Madsen 1982), which has
thirteen pithouses and seventeen pueblo-like rooms, typifies this new style of village organization.

These sites continued to be located at lower elevations than their pre-eruption ancestors (McCormack n.d.). During this time period "climatic conditions [in the lower zones] were nearly optimal for the Sinagua" (Madsen 1982:18). A combination of increased rainfall and lowered temperatures made these areas seem attractive to the Sinaguan agriculturalists. The higher areas around the base of the peaks may have been too wet for farming (Pilles 1979), but they were never completely abandoned. However, the vast majority of the sites above 2070 kilometers which date to this phase are fieldhouses, suggesting that the upper zones were used only seasonally, perhaps as a buffer against short-term fluctuations in temperature and rainfall. By 1150, "the majority of Sinagua appear to have settled at lower elevations where improved soil and moisture conditions and a longer growing season were advantageous to farming" (Madsen 1982:19).

The subsistence strategies of the Sinagua were also changing during this period. Hunting and gathering remained an important part of their economic system, as the fieldhouses in the upper zones and various pollen samples attest (Hevly et al. 1979). Despite this, however, agricultural products had assumed a much larger role in the diet by the end of this period. In many ways, this simply represents a continuation of the trends that I noted in earlier sections. Sites continued to be located in favorable areas for agriculture, and fieldhouses seem to have
been used to bring isolated pockets of soil into production. However, there are signs that what we are seeing here is not simply a continuation of traditional farming patterns, but rather the beginnings of agricultural intensification. Although good data are scarce, it appears that the Sinagua were investing more time and effort in their fields. Hohmann (1982) believes that the complexity of their field systems increased during this period, and Colton (1946) notes that, while hoes have been found in all phases, they seem to be more common in post-eruption time periods. In addition, it seems that sandstone hoes began to replace basaltic ones at about this time. These new hoes may represent an attempt to increase the overall crop yield. More information must be gathered before it is possible to reach any conclusions on this question, but the data I do have seems to suggest that the Sinaguan people of this time were involved in "an intensification in agricultural subsistence systems" (Hohmann 1982:50). Bronitsky (1979) has described a similar pattern for the Rio Grande pueblo of Arroyo Hondo.

The changes that have been described in settlement patterns and subsistence strategies suggest that there were also significant shifts in Sinagua social organization at this time. Although there were not yet nucleated villages in the classic sense of the term (Wilcox 1986), intra-settlement relations must have been more complicated in this period than they ever were before. As a village grew in size, the social demands placed on every inhabitant of the community would increase. A village with thirty or more rooms or structures would contain upwards of ten different families. Each family, and each family member, would
be expected to interact with the other people in the village in culturally sanctioned ways. No longer would an individual only interact with his or her immediate family. The web of daily social interactions would now include distant relatives, friends, acquaintances, fellow moiety members, etc. Social roles would become more complex and day-to-day activities would have to be structured to take into account these changes. Patterns of work almost certainly began to shift from individuals laboring alone to groups of people working in concert on projects large (building field systems, maintaining community structures) and small (grinding corn, tool production). Even the family structure may have begun to change with the addition of new categories of relatives to people's everyday lives.

There is some evidence that these changes in the number and nature of social roles were accompanied by a decline in egalitarianism in the larger communities during the latter part of this period. From his analysis of Sinaguan burial patterns, Hohmann (1982) has concluded that pre-Padre phase burials were remarkably homogeneous (with the exceptions discussed above). However, he notes that there is "a breakdown of homogeneity of burial treatment toward the terminus of the Padre phase and into the early Elden phase" (Hohmann 1982:41). He sees the presence of an increased number of "elite" burials as proof that the Sinaguan society was moving away from a system resembling a loosely structured chiefdom and towards a more complex, hierarchical structure.

Hohmann also notes that, during this time period, there is a