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Introduction

This book is a contemporary solution to an old problem – how to give anthropological meaning to the archaeological record. It is an attempt to provide a scientifically acceptable interpretation for a particular segment of the archaeological record, while at the same time to contribute to the development of general anthropological theory. The book elucidates the adaptive responses manifested in the archaeological remains of the North American Southwest. As a practical matter the analytical focus is on a set of artifactual and architectural observations from the mountainous Reserve area of west-central New Mexico and the flatter, more arid Upper Little Colorado area of east-central Arizona. These contrastive settings together constitute ‘the study area’ with the understanding that many of the regularities it exhibits can be observed elsewhere in the Southwest. The particular data analyzed thus are treated both as a case to be explained and as an example from which archaeological expectations may be derived for other areas where similar adaptive processes can be anticipated.

The book grew out of an acute awareness that previous meanings (or visions of the past, as I call them here) attributed by prehistorians to Southwestern archaeological materials have been inadequate and even misleading. Of course this is a personal judgment not necessarily shared by my colleagues, although it applies to recent Southwestern studies as much as to older, more traditional ones. The inadequacies of these interpretations are explicated below in order to illustrate the main pitfalls in archaeological research which this study consciously avoids. At the same time the non-specialist will have a general introduction to the Southwestern archaeological record and a brief history of its scholarly treatment.

**‘Old’ archaeological visions of the past**

When late-nineteenth-century scientists first encountered the abandoned settlements of prehistoric peoples and the cultures of the living tribes in the North American Southwest, they envisioned a remote human history of struggle, isolation, catastrophe, and retreat. Through Federal government and privately sponsored field expeditions, archaeologists and ethnographers personally experienced this rugged canyon and mesa country as a beautiful but harsh and inhospitable land of snowy winters and dry, hot summers (see Judd’s 1967 ‘partial history’ of many of these projects). Droughts, flash floods, dust storms and blizzards – all had left their mark on the landscape and in the faces of the stoic Indian people here from time immemorial. It was evident to the early investigators that environmental conditions had not been

optimal in this part of the American West for the higher achievements of which man was capable. Aridity was particularly noted as a limiting factor:

... the effects of this environment, where the finding of springs was the chief desideratum in the struggle for existence, were to influence social structure and functions, manners and customs, esthetic products and motives, lore and symbolism, and, most of all, creed and cult, which were conditioned by the unending, ever-recurring longing for water.  
(Hodge 1907: 430, quoted in Hardesty 1977: 3)

The archaeological evidence for such a view was plain: nearly impassable mountains hid deserted rock shelter-camps and ridge-top villages of scattered house pits. Further to the north, in the arid tablelands, there were many small mounds – former houses of mud and stone – sited along dry river courses and in remote canyons. The observers noted the crudeness of most of these structures, and they admired the architecturally more impressive and rare multi-storied stone house ruins that rose starkly above rolling parklands and wide valleys. Where were the former inhabitants of all these ruins? Why had they left?

Such questions were partially answered by field studies among the extant primitive tribes living in the same area (e.g., Matthews 1882; Stevenson 1894). This early



Fig. 1 The large Anasazi site of ‘Pueblo Bonito,’ in winter, Chaco Canyon, New Mexico. Large settlements in this area were among the first in the Southwest to be abandoned prior to 1400 C.E. (courtesy J. S. Athens).

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ethnological research spanned the turn of the century and was guided by an evolutionary view of human cultural history. The comprehensive and influential scheme of Lewis H. Morgan (1963 [1880]) indicated that Southwestern tribes were living examples of barbarism, an evolutionary stage defined by the practice of horticulture and rudimentary arts such as pottery and weaving and the absence of writing and other markers of true civilization. Many of the Southwestern indigenes were observed living in compact settlements that resembled the ruins all about them, and they subsisted with minimal technological elaboration on a limited array of plants and animals. Thus the vision of primitive tribes in unceasing conflict with the elements and with each other since remote times, was formed. They had banded together for protection and defense. Some final catastrophe such as an invasion from without, or internal collapse from internecine fighting, or a devastating drought, had put an end to cultural progress, leaving the survivors to make out as best they could given the meagerness of what Nature provided. It was thus as being in an arrested state of cultural development that the Southwestern Indians were seen by the first White men to study them and their material culture.

Systematic exploration and documentation of prehistoric Indian ruins and artifacts occupied Southwestern archaeologists for the ensuing half century and more. In addition to obtaining numerous museum specimens, this research filled in



Fig. 2 Zuni Pueblo, New Mexico, as it appeared in the late 1800s. The inhabitants of the Zuni area are thought to have originated in the Mogollon region to the south (from Stevenson 1894, Plate 1).

the details of the earliest vision of the cultural past and eventually blurred it with the notion of regional ethnic variety. Archaeologists became, if not anti-evolutionary like their American ethnological colleagues completely in the thrall of Boasian particularism (see Harris 1968), at least primarily concerned with collecting strictly archaeological facts and ‘synthesizing’ them. This left little room for ‘speculating’ about causes. At best there were not yet enough data for adequate generalizations; at worst there never would be.

From this sustained effort at prehistoric documentation, the imagined past appeared full of conventional but occasionally idiosyncratic behavior on the part of various primitive bands. A major prehistoric cultural entity or tradition gradually was recognized by these workers, the ‘Anasazi’ (meaning ‘ancient ones’ in the language of the Navaho tribe now living in the same area). The prehistoric Anasazi had dwelled mainly in the arid tablelands of the present states of Arizona, New Mexico, and Colorado. As more data came in from excavations and surveys, another major cultural tradition was named and defined, the ‘Mogollon.’ Mogollon territory had included the mountainous central portions of Arizona and New Mexico (for detailed summaries of these traditions see Wheat 1955; Willey 1966; Martin and Plog 1973; Ortiz 1979; Stuart and Gauthier 1984; and the site reports referenced in later chapters).



Fig. 3 Room interior, Zuni Pueblo, from a lithograph made in the late 1800s (from Matthews 1882, Plate 37).



It was found that both the Mogollones and the Anasazi had gone through similar stages of development, from simple wanderers living in crude round pitdwellings and subsisting on wild plants and animals, to more settled farmers growing corn, beans, and squash and living in above-ground masonry structures (which the archaeologists called pueblos, after the Spanish name for town). But there were noticeable differences evident from careful comparative analyses. The Mogollon cultural tradition could be distinguished from the Anasazi to the north by several technological criteria. The Mogollones made plain brown pottery while the Anasazi made greyware. The Mogollones adopted plant domestication before the Anasazi and were often engaged in hunting. Among the Anasazi there was more emphasis on crop production and elaboration of pottery decoration. The technologically more advanced Anasazi were quicker to adopt the above-ground masonry pueblo-style architecture than their neighbors to the south.

To explain these differences archaeologists proposed that the more advanced ideas, of making pottery, growing domesticated crops, and living above ground, came from the high civilizations of Mexico. The ideas (and cultigens too) had either filtered northward through a series of transmittals or were brought in by entrepreneurs who saw some value in trading with the primitive tribes of Anasazi and Mogollones. The traders in turn took back to Mexico quaint handicrafts. The Southwestern Indians were borrowers rather than innovators for the most part, it seemed.

The archaeological record indicated that eventually both the Anasazi and the Mogollones gave up subterranean dwellings in favor of above-ground houses. While in Morgan's evolutionary terms this was a progressive change toward upper barbarism, the twentieth-century archaeologists saw it as a 'diffusionary' process of idea exchange. They proposed that, in spite of the earlier differences between the two major cultural traditions, cultural interaction (by various encounters including intermarriage) and exchange of ideas (some of their own and some imported from Mexico) among the Mogollones and Anasazi had caused the change in living habits. This cultural hybridization of ideas as well as peoples had led to a merging of their traditions into a pan-Southwestern way of life. The new lifeway involved pueblo-style houses and settled horticulture in lowland settings. It was recognized that there had been certain areas where the new ideas apparently had not taken hold, where people had continued a more primitive existence. These were understood as cases of cultural backwardness through non-exposure, or cultural conservatism. The pan-Southwestern primitive farming lifeway ended prior to European entry into the Southwest; large-scale abandonment of the Mogollon and Anasazi areas, for a variety of reasons, was complete by 1400 C.E. (Christian Era).

Among the reasons for abandonment suggested by the climatological record was recurrent drought. The archaeologists reasoned that perhaps the people could not store enough food to last through successive years of bad harvests. There was also the likelihood of warlike tribes having spread southward into the Anasazi and Mogollon areas, forcing them to move into defensive locations in a few large settlements. Tribal legends indicated that the probable descendants of some of these ancient horticultural peoples are the ethnographically known Hopi, Zuni, Acoma, and the various

dialectical tribes of Puebloans in the Rio Grande Valley. The descendants of the northern invaders were thought to be the Athapaskawans (Navahos and various Apache groups) who during the historic period skirmished with the Spanish and later the Americans before they were finally subdued and confined to reservations.

**‘New’ archaeological visions of the past**

Since mid-century there has been a growing disenchantment with these older visions of the past, both Morgan’s evolutionism and what might be termed the diffusion of ideas model (see Cordell and Plog 1979 for arguments against what they see as the latter’s ‘normative view’ of culture in Southwestern studies).

In the last ten years Southwestern archaeologists have developed alternative visions, or models, of what happened in the prehistory of the area. Two popular ones focus on ‘evolutionary processes.’ One may be termed a model of ‘leadership development’ (that is, the emergence of ‘decision-makers’ and ‘hierarchical sociopolitical organization’) and the other a model of increasing ‘regional connectivity and integration’ (that is, the emergence of ‘tribal social networks’), respectively (see Cordell and Plog 1979; Lightfoot and Feinman 1982; Upham 1982 on leadership development, and see Plog 1977 and Braun and Plog 1982 on social networks). Both of these models appear to have been inspired by ethnological studies and share a general systems-theoretical orientation.

According to the leadership model, first there were groups of hunter-gatherers

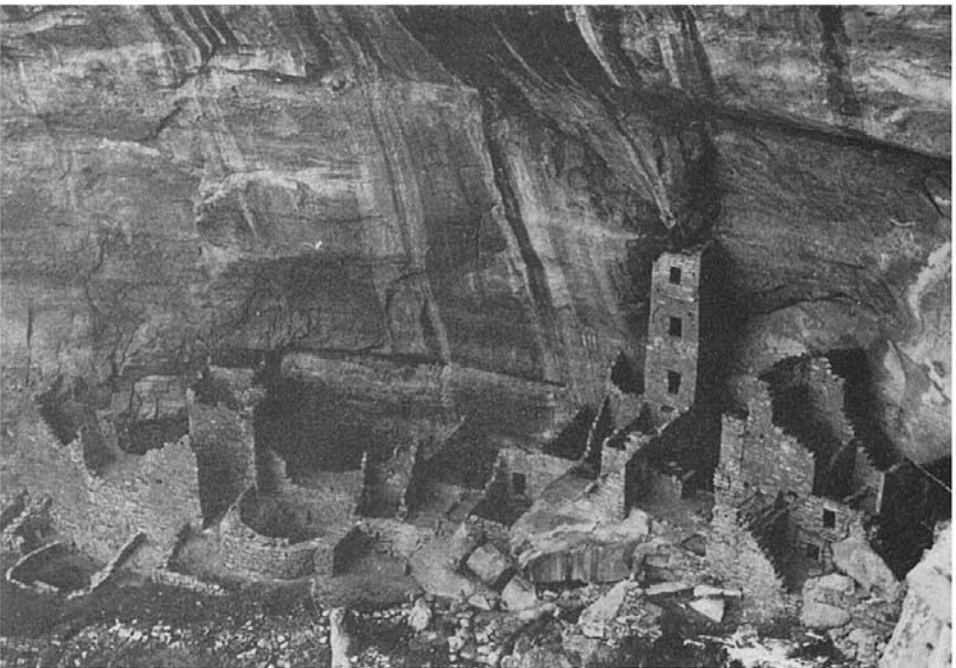


Fig. 4 Anasazi cliff dwelling in Mesa Verde, Colorado. These sites were abandoned prior to 1400 C.E. (courtesy J. S. Athens).

living at a simple, egalitarian sociocultural level, which ethnology has termed 'acephalous' or lacking any 'suprahousehold decision-makers.' All society members contributed equally to the decision-making process, and group life involved a series of decisions reached through consensus about what to do next. Typically groups moved in seasonal rhythm over a fixed territory so that the diverse environmental resources of the area could be exploited effectively and everybody could get enough to eat.

This state of affairs was only temporary, though, because certain individuals became extremely ambitious. They perceived the opportunity to seize power over others and acted without hesitation. These aspiring leaders were like the 'big men' of Melanesia and implemented strategies of power acquisition in similar fashion. They amassed food surpluses and stored them for later redistribution; they acquired more than one wife and thus augmented the size of their households; and they vied among themselves for control over a vast network of trade in environmental resources, such as local turquoise and exotic raw materials, and in manufactured items such as decorated pottery and other desirables.

From the simple acephalous society of earlier times the Southwestern aborigines by A.D. 600 were on their way to becoming participants in hierarchically organized chiefdoms based on food production, not just hunting and gathering. Leadership development at the suprahousehold level had a profound effect on prehistoric cultural evolution in the area. The competition among big men for prestige resulted in marked population increase, pressure on environmental resources, a shift from less to more intensive horticulture, large permanent settlements, and the rise of a new class structure called the managerial elite. The largest settlements, regularly spaced across the landscape, were the centers of power where members of this elite resided (Upham 1982). The competition was intense and its most desired rewards were access to social statuses, organizations, and social symbols. Nearly everybody worked very hard in those days, helping to maintain the elite. They were willing to do this because during times of food shortages the elite in their area would 'cash in' their symbolic tokens of power for real food supplies from other areas where the elite were glad to provide food produced by their followers (held in reserve for just such occasions) in exchange for the valuable tokens. This system of adaptation worked all right for a while but it encouraged overexploitation of the desertic environment, which finally was degraded to the point of exhaustion. Population dramatically declined and the large centers were abandoned. Some of the survivors returned to hunting and gathering, while others preferred to stay in a few large settlements, where their descendants still can be seen today, as Hopis, Zunis, Acomas, and the Rio Grande Pueblos.

According to the network model, no social hierarchy developed in the prehistoric Southwest. Instead, there was only an increasing degree of regional integration or connectedness among people through the millennia. Once started, this tendency continued throughout Southwestern prehistory. The end result of this process of regional integration was the rise of subregional similarities in symbolic communication characteristic of the presently known array of Puebloan groups.

Initially the Southwestern indigenes did not occupy well-defined, bounded territories but moved freely through the region and saw each other frequently. They began as ‘non-tribal’ hunters and gatherers but eventually took up horticulture as population increased throughout the region. Horticulture provided more food but under this mode of subsistence the Southwestern environment became more risky because there were higher probabilities of crop failure. ‘Tribal’ social networks were needed to decrease the risks entailed in desert horticulture, thus making life more secure for everyone. When crop failure occurred in one place, the unfortunate crop losers would call on members of their social network to share with them. Initially these networksmen were kin but, as the population grew, network membership crosscut kinship lines. People wanted to belong to more than one group so as to maximize their chances of getting help in times of trouble. Group membership was expressed through symbolic communication, especially on pottery and other decorated items, and in ritual activities such as dances and secret rites.

Finally regional integration reached a maximum when the unpredictability of the Southwestern environment made heavy dependence on domesticated crops very risky indeed. The more places crops were planted and the more people worked hard in order to increase yields, the more unstable the environment became,<sup>1</sup> and the more unstable the whole enterprise of horticulture. People could not move around as readily as before, in response to local climatic variations, because they were living in large, permanent settlements by this time. They stored food in larger and larger quantities, also in response to their curtailed mobility. Living in large settlements or in tight clusters of settlements, people developed their own symbols that only they could understand whereas before, when there had been fewer people in the region, the symbols used to communicate about network membership were more widely understood as a result of being used over wide areas. In short, people in the whole region were very well connected through these subregional symbolic traditions. While the spatial extent of networks marked through symbolic exchanges may have decreased, the intensity of such exchanges within subregions increased. This was the way cooperation was reinforced between nearby communities in the face of environmental instability under intensive farming. The ethnographically known Pueblos are living examples of the process of regional connectivity and integration.

### **Goodness of fit and deductive research**

An interesting point about all these visions of the Southwestern cultural past is that when they were first constructed the archaeological record appeared to support them all equally. The earliest vision, of an arrested cultural development at the barbaric level and final defeat at the hands of Nature and perhaps other primitive tribes, was

<sup>1</sup> This is a close paraphrase of Braun and Plog’s (1982) statements regarding environmental risk. Obviously they mean that the Southwestern environment was not optimal for horticultural intensification because of irregular rainfall, small and unreliable land plots, and so forth. A clearer statement would have identified these environmental properties as contributing to the ‘riskiness’ of the horticultural mode of subsistence in the Southwest, with the penalty for failure becoming more severe as other subsistence options were reduced (moving to other areas, relying on wild foods, etc.). The reader is invited to consult their work directly on this point, particularly pp. 513–15 and 518.



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corroborated by the numerous abandoned settlements and their artifactual contents of crude design. The eventual adoption of above-ground dwellings, the manufacture of pottery and the growing of domesticated crops, even though primitive, supported the diffusion of ideas model. These facts clearly testified to the receptiveness of the Southwestern natives to advanced ideas from the high civilizations to the south, if not to their own inventiveness. The more recent visions of Southwestern prehistory, of ambitious individuals and their followers getting involved in an ultimately destructive competition over symbols or, alternatively, of a pattern of increasing connectedness among people through benevolent social networks marked by symbolic communication, also appear to be supported by the data. In the case of these later visions, statistical tests have been performed. They have demonstrated that the regular spacing among sites really fits the spacing expected to occur between elite centers, that the patterned distribution of exotic goods really fits that expected to occur when such goods are traded, and that the frequencies of large houses vs. those of small houses in pithouse villages really fit the frequencies expected in societies marked by a minority of aspiring leaders (the latter living in the few large houses and their subordinates living in more numerous small houses). Statistical tests have shown as well that distributions of pottery designs on vessels from sites of different age really fit those expected if regional integration and connectedness increased through time.

Paradoxically, that all these visions have been or are now in relatively good fit with the archaeological facts is one of the most decisive arguments against using goodness of fit to establish their validity. Concomitantly, it points up the spuriousness of the notion of 'archaeological testing' embodied in many recent works which delineate these visions of the cultural past. Philosophers of science who have studied the problem of validation clearly distinguish between procedures designed to demonstrate goodness of fit between data and a proposed explanation, and procedures designed to validate a proposed explanation (see especially Popper 1959 and Hempel 1965, 1966). They have emphasized that, to be validating, testing procedures must be capable of *selecting* the best one among competing explanations. Since any number of explanations for the same data could be in equally good fit with those data, and since no more than one explanation can be right, goodness of fit cannot be the criterion for deciding which explanation to retain. Given this analysis, the archaeological testing and its statistical results, which lately have become the *sine qua non* of modern Southwestern archaeology, are really nothing more than demonstrations of good fit between explanations – the visions of the past in question – and the archaeological record they purport to explain. They have no validating power in the scientific sense.

Deductive research begins with the observation of certain well-recognized yet intriguing facts (I thank Y. Zan for this felicitous phrase). The function of the explanation is to render these facts no longer intriguing, ambiguous, puzzling, and so forth. Of course, the explanation must be in good fit with these facts. But to be validated it should also be in good fit with the events it predicts to occur in nature, which are independent of the intriguing facts it explains. These independent events need not be intrinsically intriguing (by themselves they can be quite unremarkable).

They become facts of interest only because they happen to have a bearing on the validity of an explanation in question.

In a simplified manner, deductive research can be described to contain the following critical ingredients. It begins with the recognition of intriguing observations. It proceeds with the formulation of an explanation. Then follows an examination of its good fit with the intriguing observations, a derivation of test implications (namely, the prediction of independent events which should be borne out in nature if the explanation be true), and finally the implementation of procedures designed to find out if these independent events indeed are borne out in nature.

This simple description allows us instantly to dismiss the notion, so common in the Southwestern archaeological literature, that to do scientific archaeology is 'to test hypotheses' (i.e., scenarios or visions of the kinds described above) 'against the archaeological record.' This notion implies that research can begin with the formulation of hypotheses *without prior recognition* of any intriguing observations to be explained. The research proceeds with the testing of these hypotheses against an arbitrarily selected empirical domain, viz., the archaeological record. Hence the belief that to do scientific archaeology is to test hypotheses against archaeological observations.

Actually, in deductive research the identity of the observations against which a hypothesis may be tested cannot be determined arbitrarily and in advance. A hypothesis is tested only against observations that are directly relevant to deciding its validity. Just which observations are going to be relevant can be determined only after the hypothesis is stated, not before. The notion of archaeological testing one encounters in the literature implies a quite arbitrary and rigid directive that hypotheses must be tested against archaeological observations if archaeologists are doing the testing, regardless of the nature of the hypothesis and regardless of what may be the directly relevant observations which an evaluation of its validity actually calls for. Like good soldiers, many archaeologists seem to be following this order and not asking any questions.

In fact many of the 'hypotheses' we find in the Southwestern archaeological literature are extensions of ethnographic scenarios (Renfrew 1982) and visions of the kinds described earlier. To view the archaeological record as the empirical domain against which such scenarios are tested is to assume, by implication, that the archaeological record is *not* the well-recognized, intrinsically intriguing phenomenon to be explained. Instead, it is a large body of facts whose true nature is already known. (I wonder how many hypothesis-testing archaeologists would confidently assert this in public!)

It is apparent that archaeologists subscribing to 'archaeological testing' have misunderstood deductive research. While thinking they are validating explanations by 'testing' them against the archaeological record, they are merely demonstrating the good fit between the archaeological record (the intriguing phenomenon to be explained) and their scenarios of the past (that is, its explanation).<sup>2</sup>

<sup>2</sup> Binford (1983a: 67 and 1981: 238–92) has argued that 'archaeological testing' is only the construction of 'post-hoc accommodative arguments' rather than true testing.