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1977

THE DISSOLUTION OF BOUNDARIES:
A STUDY OF ENVIRONMENTAL CONCOMITANTS IN TWO CULTURES

by

NATALIA MICHAELENE KRAWETZ

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1977

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

THE DISSOLUTION OF BOUNDARIES: A STUDY OF ENVIRONMENTAL CONCOMITANTS IN TWO CULTURES

by

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In dealing with numerous environmental epistemologies the problem confronting environmental disciplines is that none seems suitable as an all-encompassing framework; hence a continuum is proposed. The foundation of the continuum is posited as the life process itself, conceived in terms of a dynamic and constantly readjusted tension between mergence and nonmergence tendencies. In spite of the possibility of unique epistemological positions for every human, there is a surprising amount of consensus which is attributed to a common socialization process, i.e. culture.

It was assumed that members of a society formulate and construct components of the built environment in a manner consistent with their worldview. Thus it was hypothesized that in different cultures there will be evidence in the physical components of the built environment which reflect and are reflected in differences in epistemological position. It was also recognized that, for the purposes of analysis, a culture may be viewed as a static entity at any point in time, but considered over a period of time it changes and evolves. Four studies of the Navajo and Zuni cultures were undertaken.

In Study 1, the basic hypothesis was tested in a base time period (circa 1885-1926). Three components of the built environment were selected for comparative purposes: the dwelling, the ceremonial structure, and the settlement pattern. Descriptions of each were compiled from archival sources and were content analyzed according to a standard procedure which had been tested for reliability. These descriptions were compared to criteria developed from the culture's epistemology. Using similar methods Studies 2 and 3 concerned the evolution of the fit between epistemology and built environment, focusing on the dwelling during periods of varying Anglo impact. Finally, Zuniland was studied using field methodology in the summer of 1976.

Results indicated a great deal of consistency, termed fit, between epistemology and all aspects of the built environment studied during the base time period. With time and varying degrees of Anglo impact, the relationship changed as a result of the adoption and adaptation of Anglo structures and acculturation.

Aspects relevant to fit are suggested and several possible models are described in terms of their ability to accommodate consistent evolution of form. A transformational model which incorporates the epistemology and built environment aspects of both cultures involved in a process-oriented, participative approach is proposed, in contrast to traditional approaches which regard the built environment as a set, inflexible product. It is suggested that until the built environment is treated from a process as well as a product orientation, misfit will continue to occur in cross-cultural endeavours because the time frame and the ramifications of contact between different cultural bases are too narrowly defined.

Preface

There are many people who have helped this dissertation come to fruition. To all of them, too numerous to mention and to those who chose not to be named, I extend my thanks for greeting this project in the spirit of cooperation and goodwill.

My deepest gratitude is to the Zuni People who through their Governor, Mr. Edison Laselute, allowed me to visit Zuniland and conduct my field research. To the Zuni Tribal Historian, Mr. Andrew Napetcha, go special thanks for the patience and care with which he described Zuni lifestyle. Responsibility for the final product is, of course, my own.

My debt is to the many native Americans of the southwestern United States who shared with me some of their hopes and concerns about the environment and themselves, and enabled me to "know" some of the power and meaning of intense environmental experience. It seems only fitting to acknowledge that:

If you take all your books, lay them out under the sun, and let the snow and rain and insects work on them for a while, there will be nothing left. But the Great Spirit has provided you and me with an opportunity for study in nature's university, the forests, the rivers, the mountains, and the animals which include us (McLuhan, 1971, p. 106) [a] lack of respect for growing, living things [leads] ... to lack of respect for humans too (McLuhan, 1971, p. 6).

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GLOSSARY

Acquisition method: housing delivery method in which an Indian Housing Authority restores and then acquires existing housing.

ADCF: Archival Data Collection Form.

BIA: Bureau of Indian Affairs.

Catchment: surrounding area.

Conventional method: housing delivery method in which an Indian Housing Authority contracts an architect to prepare plans and then selects a contractor.

Council of the gods: five major dancers of the Shalako ceremony.

Environmental epistemology: an implicit set of assumptions about how to build, use and view the environment based on a theory of knowledge.

Female hogan: traditional Navajo dwelling.

fm: tendency from mergence, toward the knower which ensures the distinctness of a knower as an organism and demarcates it as an individual.

FmHA: Farmer's Housing Assistance.

Force account method: housing delivery method in which an Indian Housing Authority acts as its own contractor.

HIP: Housing Improvement Program.

Historic area: the oldest area of the Zuni pueblo.

Hogan: traditional Navajo building.

HRAF: Human Relations Areas Files.

HUD: Housing and Urban Development.

IHA: Indian Housing Authority.

IHS: Indian Health Service.

Imposed dwelling: dwelling used in a culture but whose structure was formulated by members of another culture.

Intraface: a boundary created within a single system between two of its components.

Kachina: "the other-dimensional shapes of mountains, trees, birds, animals, the dead -- recalled from a dimensional plane that is not yet apprehended spatially" (Waters, 1950, p. 456).

Kiva: Zuni ceremonial structure.

Koyemshi: the major builders of Shalako houses, ten in number, considered the offspring of deity fathers and human mothers.

Longhorn: the rain priest of the north kiva; a member of the Council of the gods.

Male hogan: traditional Navajo religious structure.

Modified traditional dwelling: traditional dwellings having some features attributable to extra-cultural influences.

Mutual help method: housing delivery method in which the future owner contributes land, money or labour toward the building of a house.

MH: see mutual help method.

NHA: Navajo Housing Authority.

Phratral groups: groups of clans.

Shalako: six gods (one for each kiva) who visit Zuni at the winter solstice.

Sing: a Navajo ceremonial.

Singer: a Navajo who knows the words and rituals for a particular healing ceremony.

Sipapu: the hole through which people came from the third world into the fourth.

Tenientes: tribal council members.

tm: tendency toward mergence, toward the (un)known, binding a knower to all living matter.

Turnkey method: housing delivery method in which an Indian Housing Authority selects and contracts from a developer.

VA: Veterans' Administration.

Vigas: crossbeams used in the roof of adobe structures.

CHAPTER 1

INTRODUCTION

You ask me to plow the ground. Shall I take a knife and tear my mother's breast? Then when I die she will not take me to her bosom to rest.

You ask me to dig for stone. Shall I dig under her skin for her bones? Then when I die I cannot enter her body to be born again.

You ask me to cut grass and make hay and sell it and be rich But how dare I cut off my mother's hair? (McLuhan, 1971, p. 56).

This quotation reflects a view of the world as an intimate relationship between the individual and the nonhuman environment. It is one worldview of many, each positing a different kind of relationship and having one thing in common -- a link between the view of the human and the nonhuman. The term environmental epistemology is used when referring to that link, for it is our purpose to demonstrate the possibility of a systemic relationship between epistemology and environment within the context of culture. Specifically, the concern is with the connection between environmental epistemology and the built environment of a society. To outline this position, three areas of concern will be discussed: (a) epistemological positions in general and the nature of the proposed system of relationships specifically; (b) the role of culture in environmental epistemology; and (c) possible environmental concomitants of a culture's epistemological position.

Environmental Epistemology

Possible Epistemological Positions

The issue of what defines the boundary between human and nonhuman from the perspective of human experience is viewed as crucial to the development of contemporary environmental theory (Barker, 1968; Craik, 1970; Rolston, 1975; Watts, 1960, 1973). This is particularly the case with environmental psychology, the most anthropocentric of these fields, for it focuses on the relationship of human beings and the social and nonhuman environments. To date, discussion has emphasized the manner of interrelation of elements involved, implying that the terms themselves have been adequately denoted. Yet few have tried to define them and when doing so often rely on common sense definitions. The nature of a system comprised by these elements is essentially an issue of environmental epistemology, necessitating an examination of the possible relationships between knower (human) and (un)known (nonhuman).

Traditional approaches to epistemology range from absolute objectivism to absolute subjectivism. The former posits a universe of (un)knowns having an existence independent of their knowledge by the knower, whose knowledge of the (un)known is veridical to this real existence. The latter posits a universe of (un)knowns being entirely the product of one knower. An intermediary position, dualism, posits a universe of (un)knowns having an existence independent of their knowledge by the knower, whose knowledge of them is mediated by mechanisms which somewhat distort the (un)knowns. Allowing for this error, the real nature of the (un)known can be determined. Thus, it is possible to infer a continuum of relationships between knower and (un)known, ranging from absolute objectivism to absolute subjectivism (Montague, 1962).

In dealing with environmental epistemology, the possible relationships between components can be explicated in a similar manner, for the concern is with a knower, a human individual or group, and an (un)known, a nonhuman unit or group. Indeed the manner of relation of constituent parts is a current issue of debate in environmental disciplines. On the one hand are the proponents of separation and interaction who believe that, as the semantics suggest, there are separate entities -- the human being and the physical environment, and that the focus of interest is appropriately their locus of interaction (Barker, 1968; Craik, 1970). On the other hand are the proponents of undifferentiation who suggest that the separation is far from clear and that it is more appropriate to view all as one (Rolston, 1975; Thomas, 1974; Watts, 1960, 1973). While no clear distinction between elements of a system is possible, denying the separateness of the components involved does not account for what distinctness exists. And without some articulation of contents, the field becomes impossible to study in a scientific manner. However, from this diversity of opinion, an environmental epistemological range can be deduced from complete separateness of human and nonhuman components to complete union. Moreover, rather than choosing one epistemological position as most appropriate, this continuum is acknowledged and examined.

The Proposed Epistemological Position

It is proposed that there is no "correct" human-nonhuman boundary and that environmental epistemological positions "can be so differently classified and so diversely characterized as to make each of the pictures unintelligible in terms of the others" (Pletcher, 1976, p. 235). And

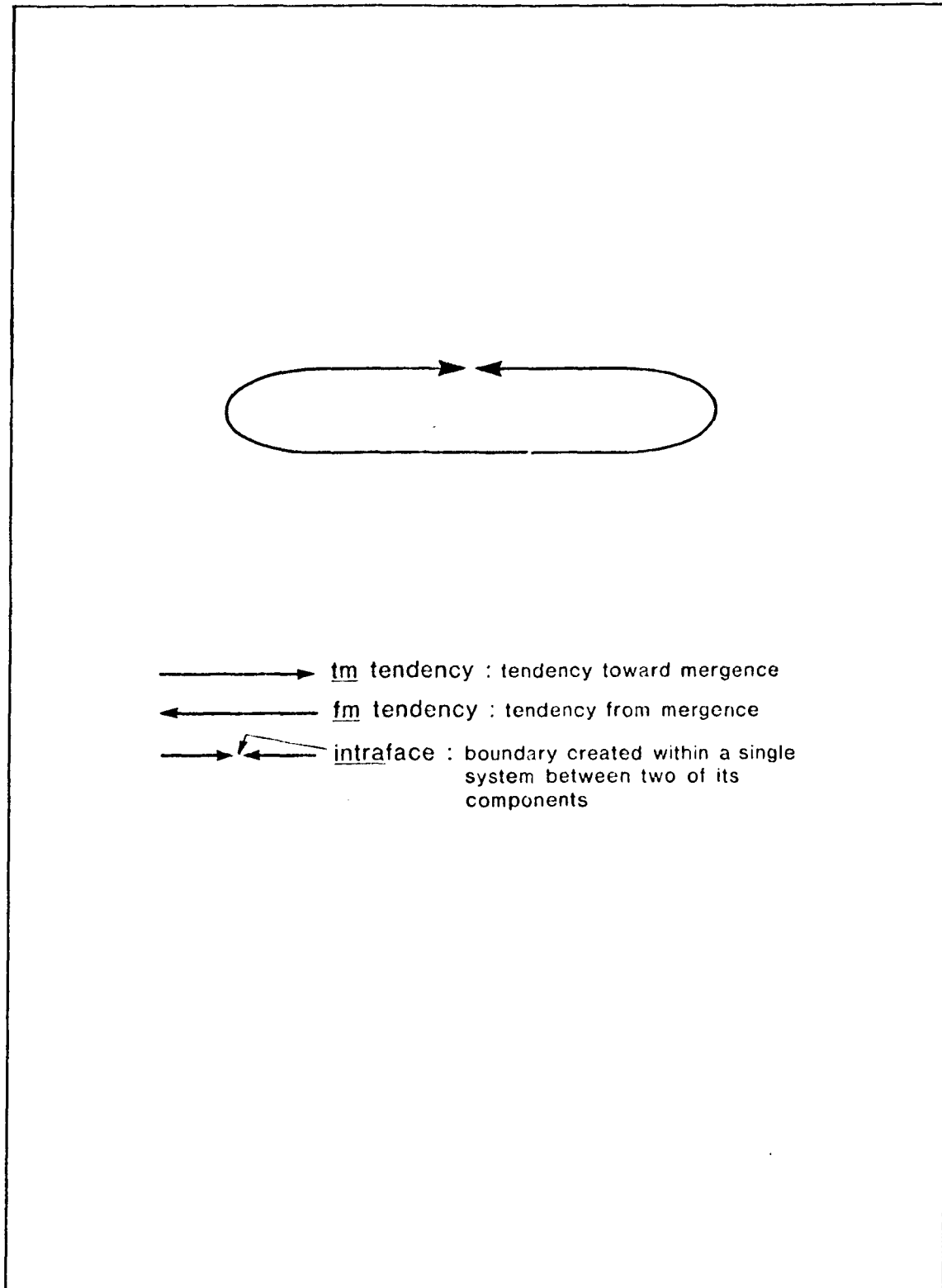
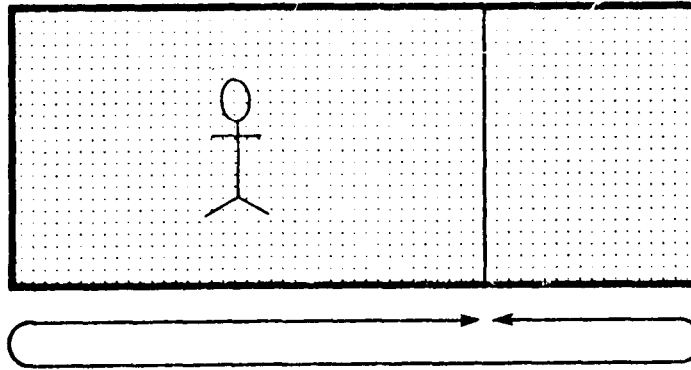


Figure 1 : tm : fm tendencies in space-time continuum meeting at their intraface. Note that the position of the intraface depends on where the experiencer perceives it to be

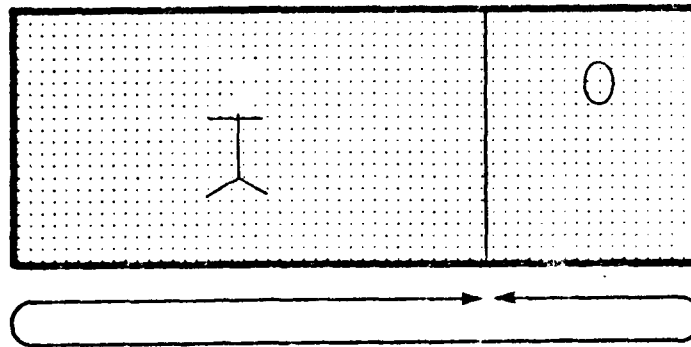
yet it is possible to conceptualize a system in which these diversities are united. It can be thought of as an all embracing system or continuum, in which each point can be separated analytically and having certain ineffable characteristics (Siu, 1957).

To account for this range, its foundation in the life process itself is postulated and the existence of two tendencies intrinsic to life is proposed. One is the tendency toward mergence (tm), toward the (un)known, binding a knower to all living matter. The other is the tendency from mergence (fm), toward the knower which ensures the distinctness of a knower as an organism and demarcates it as an individual. As members of a dynamic system, these tendencies are inseparable and generate each other. Yet they are bounded by an intraface, a boundary created within a single system between two of its components. Intrinsic in this definition is the notion of the manifestation of the relationship between the two processes : tm and fm, by the mutual creation of the intraface. The nature of the intraface changes depending upon changes in tm:fm equilibrium (Figure 1). Complete mergence or nonmergence, like absolute subjectivism or absolute objectivism, are theoretical limits. Environmental objectivist positions are those in which the tendency fm is greater than tm (Figure 2b). Consider the following:

The view of the city and mountain from my sickbed seemed to me like a painted curtain with black holes in it, or a tattered sheet of newspaper full of photographs that meant nothing. Disappointed, I thought, "Now I must return to the 'box system' again" (Jung, 1963, pps. 292 - 295).



A. Human and nonhuman environment are experienced as one in relation to the rest of the nonhuman environment



B. Portion of the human is experienced as an entity in relation to the rest of the human and the nonhuman environment

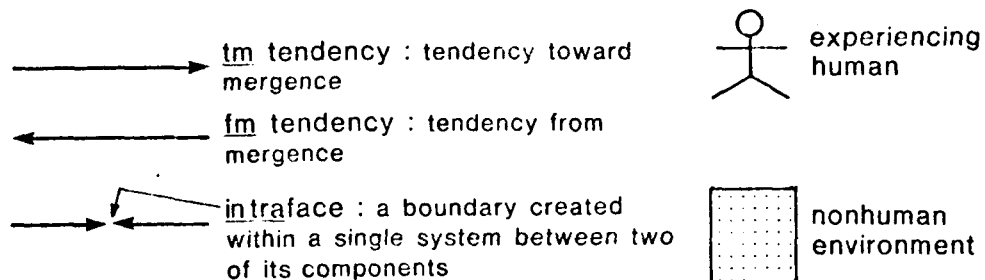


Figure 2 : Different Human - Nonhuman Environment Relationships

Similarly, environmental subjectivist positions are those in which the tendency tm is greater than fm (Figure 2a). The following is an example: "I felt myself one with the grass, the trees, birds, insects, everything in Nature. I exulted in the mere fact of existence, of being a part of it all -- the drizzling rain, the shadows of the clouds, the tree trunks, and so on" (James, 1974, p. 380). Thus the varying tm:fm ratios can describe a continuum of environmental epistemologies from objectivism to subjectivism, whose basis is in the experience of life.

The proposed model implies that the traditional question in environmental disciplines of what constitutes knower, i.e. human, and, (un)known, i.e. nonhuman, is misleading. In this paper, these are not defined as two discrete and static entities in which, for example, the knower is taken as ending at the skin and the (un)known is defined de facto as everything else. Instead a continuum bounded by opposing tendencies has been developed, in an attempt to account for the fluidity and overlap involved in environmental epistemology, and in the process of knowing. In this way, the terms, human and nonhuman, have been superseded by the tendencies, fm and tm. This is not to imply that they are synonymous but rather that the latter set of terms encompasses the former and proves more useful in this analysis. When the terms, individual, human, environment, nonhuman, are used in this paper, the tendencies and their implications are not discounted, rather we bow to the limits of semantics.

This leaves us with a broad choice of appropriate environmental epistemologies limited only by the knower's capabilities. What accounts for these limits* Assuming an anthropocentric position, a number of factors is postulated which predispose the knower toward a specific

environmental epistemological position. These include: the biological capacity of the human species, developmental and psychological factors relating to the individual, situational events, and environmental and cultural contexts. Although the factors themselves are postulated to be universal, it should be noted that the evidence used in the following discussion arises from the Western academic tradition. Therefore, the nature of the evidence relating to the factors, i.e. the particular theories discussed, is acknowledged as culture-specific.

Biological factors. The biological foundation of the human species sets limits within which humans can act. For example, Bogen (1973) suggested that the epistemological problem is reflected in hemispheric specificity. Within these bounds, three factors are discerned as relevant to our interests: the degree to which the organism has matured, state of health and current physiological state. Since maturation is discussed in detail in the following section, it will not be elaborated here. To take an extreme example regarding health, the ability of a person in a coma to express knowledge is likely to be limited compared to a healthy, conscious peer. Similarly, changes in physiological systems change one's capacity to experience knowing. Mystic revelations about the universe while under the influence of drugs is an example.

Developmental factors. Maturation and stage in the life cycle may affect one's epistemological capability. According to the Western developmental theory, the human organism at birth has no conception of the difference between internal and external experience; all is viewed as one. This position has been elaborated by Piaget (1973) who stated that:

it is . . . indispensable to establish clearly and before all else the boundary the child draws between the self and the external world [p. 46]. . . . He situates in the world or in others what we seat within ourselves, and he situates in himself what we place in others That the child shows a keen interest in himself . . . egocentricity, does not prove that he is conscious of his self, but suggests on the contrary, that he confuses his self with the universe, in other words that he is unconscious of his self [p. 157]. . .

The stages listed below are thought to lead to the establishment of a discrete self and a self-environment dichotomy: (a) absolute realism, in which there is no distinction between the instruments of thought and where the objects alone appear to exist; (b) immediate realism, in which there is a distinction but the instrument of thought is situated in things; (c) mediate realism, in which the instrument of thought is situated in the body and surrounding air; and (d) subjectivism or relativism, in which the instrument of thought is situated within ourselves (Piaget, 1973, p. 152). It is only once this last stage has been reached that the human has the tools for abstract, rational thought. However, adult regression to former stages is possible when "the weakening of the sense of personality leads to realism and the realism to more or less clear magical ideas" (Piaget, 1973, p. 184). The following are examples of this kind of regression: dreaming and reverie, involuntary imitation, anxiety, and "monöideic" desire. What seems important here is the blending of various stages into one another, even though the mature

adult has a distinct sense of internal and external and thus of human and nonhuman environment, along with thought processes which operate to reflect this viewpoint.

Lewin (1935) too has written on the difference in the relationship between human and environment in the child and the adult. He regarded the individual as a dynamic, relatively closed system which varied according to differences in: (a) structure -- the degree of differentiation and harmony of subordinate parts; (b) state of the system -- the degree of tension; (c) meaningful content -- historical influences (e.g. culture, past experience); and (d) material -- the degree of fluidity of the structure, indicated by variations in the thickness of the boundaries separating the various parts of the system. From this viewpoint, the child's system is more unified than that of the adult and the boundary between human and environment is less developed. There is slight differentiation of internal structures in the child's system and little functional firmness in the boundaries of the various psychological systems. Thus the environment operates strongly upon the child. Moreover, certain persons or objects may be so closely related to the human that separation from them weakens the child's strength over the environment.

The tendency of children to take a doll or some favorite toy along to bed is another expression of the close union of these objects with the self Such objects are dynamically somewhat like his own body in that they represent points of special sensitivity to invasions by environmental forces. Whether an object belongs to the self or to the outside world depends . . . among other things upon the present needs and internal tension systems of the child and changes with them (Lewin, 1935, pps. 109 - 110).

One can conclude that the traditional conception of maturity in the West is of an individual able to differentiate between self and nonself,

human and environment, that is to say s/he is an epistemological dualist. examination of any changes which might occur. In fact, it is implied that development culminates after adolescence and does not change until old age.

The nature of and extent of this change has been the focus of research on the aged. On the one hand, the activity theory of aging "implies that, except for the inevitable changes in biology and health, older people are the same as middle-aged people, with essentially the same psychological and social needs" (Havighurst, Neugarten & Tobin, 1968, p. 161). On the other hand, disengagement theory suggests

that the individual's withdrawal has intrinsic, or developmental, qualities as well as responsive ones; that social withdrawal is accompanied by, or preceded by, increased preoccupation with the self and decreased emotional investment in persons and objects in the environment; and that, in this sense, disengagement is a natural rather than an imposed process (Havighurst et al., 1968, p. 161).

Implicit in this view is the notion that the human tends toward the nonmergent state as a function of increasing age. This may very well be a function of generalizing beyond an urban, Western sample for which withdrawal is culturally acceptable and the aged are de-valued, to an allegedly universal process.

Research results on aging are ambiguous (Shanas, 1968) and both theories are supported, somewhat. For example, there is some evidence of increased disintegration of self (Bloom, 1961; Rosen & Neugarten, 1960); but the way in which the measures were given is questionable. To illustrate: Tuckman, Lorge and Zeman (1961) asked each person in two

groups (one with an average age of 32 years; the other, 73 years) to draw her-/himself. The drawings of the older group were rated as less mature and less intact; often parts of the body were missing or not connected in the representations. Since such drawings are considered to be indices of self-image, the researchers concluded that a disintegration of the self had occurred with age. Yet to give people of various ages the same test without considering biophysiological changes (e.g. poor vision, slower reaction time, possible arthritic hands) that could affect the results, renders the research inconclusive. It would be pointless to try to interpret the results in terms of tm and fm tendencies.

In summary, the traditional Western perspective conceived of human development as having been achieved when a firm human-environment dichotomy is established. There seems to be no further growth in these terms, until there are changes associated with advanced age. Hence the research focus has been on children and the aged.

Implicit in the ideas presented is a value system in which the individual's maturation is conceived in terms of her/his progression from lower to successively higher stages. In this scheme the lower, immature stages are those in which human and environment are confused, i.e. in which the child perceives little or no distinction between her-/himself and the rest of the human and nonhuman world. The higher, mature stages of development involve the successive differentiation of self and nonself, internal and external, until a fairly rigid human-environment dichotomy is established. All undifferentiated experiences and states have been considered regressive, i.e. comparatively immature.

By implication then, there would be no difference between feelings of oneness of children, mystics and/or those with certain psychoses. For example, Prince and Savage (1972) considered them all as cases of regression and then found it difficult when attempting to elucidate the differences. However, there is evidence to suggest that the experiences are of a different order, at least in the case of the schizophrenic as compared to the mystic (Wapnick, 1972). Moreover as Werner (1948) proposed, it is not always the case that undifferentiated patterns of organization are chronologically prior to differentiated ones. That they are different does not imply that one is better than the other.

For the purposes of this study it is assumed that the knowledge about mergence of the schizophrenic, mystic and child are of a different order. Two kinds of mergence processes are suggested: reversion and evolution. Reversion refers to the change to a former stage of development, and is consistent with the traditional developmental view. In evolution, the individual though well aware of the mature sense of differentiation is able to transcend it, and integrate mergence into her/his repertoire. It is the meaning and the goal that differentiates the two states. It should be noted that the view expressed on these mergence processes is similar to that expressed by Schachtel (1959) on oneness.

The "oneness" established with the object in the intense relatedness of such allocentric perception is different from the "oneness" with the objects with which autocentric perception starts out in life. The former presupposes a temporary eclipse, of all the perceiver's egocentric thought and strivings, of all preoccupation with self and self-esteem, and a full turning towards the object; the latter antedates the birth of the self as a conscious object of worry, ambition, fear, need, and antedates the experience of "I" as separate from the world. The oneness of allocentric perception leads not to a loss of self, but to a heightened feeling of aliveness (p. 181).

Moreover, by suggesting a longterm view of maturation rather than one which traditionally ends with adulthood, changes in the equilibration between tm and fm tendencies in the human are implied with each stage of development. In similar ways, Erikson's (1963) eight ages of man and Sheehy's (1976) passages involve at each stage some resolution of polarities. Therefore it is posited that: the task of the developing human is the differentiation of human from environment; from time to time the task reverses itself -- to the mergence of human and nonhuman environment even if the individual is able, at other times, to experience their alleged separateness. This is the foundation of the epistemological dilemma between intimacy and discreteness of knower and (un)known.

Psychological factors. Two characteristics of the individual which merit consideration in this framework are one's mental state and locus of control.

Some of the most striking Western research evidence dealing with the tendencies is that on mental states. For example, autistics and schizophrenics have difficulty in differentiating along socially acceptable norms, and thus may not be able to distinguish between internal and external. What may be viewed as an external referrent in terms of the "normal" individual may be experienced as part of the experiencer. Certain psychotics have the reverse difficulty, which could be termed, overdifferentiation, for in this case parts of what would "normally" be viewed as belonging to the experiencer are viewed as external.

Several researchers (Bateson, 1961; Kaplan, 1964; Laing, 1965) have focused on the similarity between the process of schizophrenia and the experience of transcendence. For example Laing (1972) related "the

transcendental experiences that sometimes break through in psychosis, to those experiences of the divine that are the living fount of all religions" (p. 105). Indeed he seemed to view this experience as an important aspect of the recovery process. Based on previous discussion, such states can be classed as manifesting mergence.

An interesting variable which could influence one's experience of tm and fm tendencies is locus of control. This term is used in the manner in which Angyal (1941) did, to describe the A:H ratio. Perceived internal locus of control is consistent with nonmerged states; whereas perceived external locus of control is consistent with merged states. It would be tempting to suggest that one's ability to experience such states relates to the psychological literature on self-concept and locus of control, for it has been found that clarity of self-concept was positively and significantly related to the degree of internality (Epstein & Komorita, 1971; Organ, 1973). This is relevant to the discussion only to the extent that the idea of self-concept can be considered a manifestation of the fm tendency. However what is meant by the term, self-concept, and in turn by self, is unclear in current psychological thought (Wylie, 1968). The variety of definitions that has been proposed is evidence that consensus has yet to be reached. Thus such evidence must be interpreted in a most cautious manner until the terms are clarified.

Situational events. Certain situations influence the nature of one's knowledge of the environmental epistemological continuum. For example, victims of near drowning report feeling calm, peace, acceptance and transcendence (Degnam, 1975). Religious conversions or rituals in which one reports feeling at one with God are of a similar nature

(James, 1974). Needless to say, what constitutes a situational event may be culturally defined.

Environmental context. There are countless examples of environments and environment elements which seemed to influence experiential knowledge of the tm tendency -- mountain tops, waterfalls, oceans and incense (Ornstein, 1972; Watts, 1973). Ornstein (1972) denoted two characteristics which made them facilitators: they provide a focus and thus keep external stimuli to a minimum to help one avoid distractions; and they stimulate the tm tendency by providing an overpowering milieu in which the individual is but a small part, as in the following example.

Once it was when from the summit of a high mountain I looked over a gashed and corrugated landscape extending to a long convex of ocean that ascended to the horizon, and again from the same point when I could see nothing beneath me but a boundless expanse of white cloud What I felt on these occasions was a temporary loss of my own identity, accompanied by an illumination which revealed to me a deeper significance than I had been wont to attach to life (James, 1974, p. 84).

Not only are the sudden flashes of awareness that the environment facilitates of relevance, but also the slowly unfolding dynamic between human and nonhuman. Perhaps the best illustration of this is a description of the relationship between the builder and the built, in the following passage.

I had to achieve a kind of presentation in stone of my innermost thoughts and of the knowledge I had acquired. Or, to put it another way, I had to make a confession of faith in stone.... From the beginning I felt it as in some way a place of maturation During the building I never considered these matters. I built the house in sections, always following the concrete needs of the moment. It might also be said that I built it in kind of a dream. Only afterward did I see how all the parts fitted together and that a meaningful form had resulted; a symbol of psychic wholeness (Jung, 1963, pps. 223 - 226).

Thus environments and environmental elements (components of large scale environments) could influence the nature of one's knowledge.

In summary in answer to the question, what accounts for the limits of the experiencer regarding the choice of environmental epistemology, five sources of influence are posited: biological, developmental and psychological factors, situational events, and environmental context. Yet in spite of individual differences, there is an amazing amount of consensual knowledge.

The Role of Culture in Environmental Epistemology

It is consensuality that brings the role of culture to light, for the sharing of a viewpoint implies a history of shared experience and one method of obtaining common experience is through a common socialization process, i.e. through a common culture. In a way then, a common structure of reality can be attributed to a common culture (Berger & Luckman, 1966).

A cultural framework for environmental knowledge and the interpretation thereof is posited, consisting of a support system of opportunities, times, roles, environment elements, and environments, within which the individual can know. A highly integrated, i.e. politically complex culture (Steward, 1963), may have more than one support system for more than one kind of epistemological position; but it is assumed that priorities are assigned to the different types. A mere frequency count of the number of kinds of supports available would give forth a distorted picture indeed, for the cultural priorities may not be manifest through quantitative analysis. In any society, a great deal of time, space and wealth may be spent in regulating knowledge. Because

frequency does not adequately describe the options available to the individual, the support system must also be evaluated in terms of the cultural meaning and significance attached to that kind of experience.

A sociocultural milieu can be regarded as a channel of supports for certain kinds of experience. These supports (or lack thereof) are manifest in the five features previously mentioned: opportunities, times, roles, environment elements and environments. Opportunities for environmental knowledge can be inferred from the daily routine and/or in special events. There may be collective events, as in ecstatic rituals in which everyone participates, or individual ones, as in the North American Plains Indian vision quest (Lowie, 1963). There may be specific times for such a task. Individuals or groups may adopt roles in which they establish a relationship with the nonhuman environment. Indeed it may be their function to have them on behalf of the group and/or to utilize the knowledge gained in this manner for societal benefit. These roles may be highly valued as in the case of shaman or scientist, or may be labelled unacceptably deviant as in the case of the witch or charlatan. Accessibility to a particular role may depend upon level of cultural integration. The human through association with environment elements (e.g. totems, soul-partner animals, sounds, smells) may come to understand the nonhuman environment. Finally, environments, i.e. areas of the nonhuman environment, may be set aside as places for personal-environment contact, solely or in addition to the other uses they serve. Moreover there may be rules limiting their use to specific times, to groups or individuals. What is important here is that members of a culture may specify areas for gaining access to the environment by a particular means. In summary, consensuality of epistemology can be

accounted for through the use of a support system, a common socialization process.

Environmental Concomitants of Epistemology

The possibility of a common environmental epistemological position, i.e. one that is shared by the members of a particular culture, has been mentioned. In this light, it is suggested that one possible medium through which a common socialization process can be reinforced is the material aspects of the culture (as in the physical components of the built environment) for it is up to the members of a society to formulate and construct them. The relevant features of any built component could be conceptualization, function and/or organization. The terms, though interrelated, can be distinguished. Conceptualization of a physical component refers to the way in which it is viewed, its meaning and significance; function refers to purpose or use; and organization deals with the relationship among constituent parts -- both in terms of the relationship among elements which comprise its physical appearance, and in terms of patterns of use.

In this way a consistent fit can be envisaged between the built environment and traditional epistemology. The concept, goodness of fit, refers to

the ensemble comprising the form and its contents. Good fit is a desired property of this ensemble which relates to some particular division of the ensemble into form and context.... The symmetry of this situation (i.e., the fact that adaptation is a mutual phenomenon referring to the context's adaptation to the form as much as to the form's adaptation to its context) is very important.... We may even speak of a culture itself as an ensemble in which the various fashions and artifacts which develop are slowly fitted to the rest... (Alexander, 1969, p. 43).

Thus harmony between epistemology and the built environment is assumed,

though this is not to infer that epistemology is reinforced solely through built environment; it may be manifest in a variety of media. For the purposes of this study the focus is on the possible connections between epistemology and the built environment, even though each one, individually, and the resultant relationship between the two may be subject to many other influences within the societal fabric.

Summary

There are numerous environmental epistemologies ranging from absolute objectivism to absolute subjectivism. However the problem confronting environmental disciplines is that none seems suitable as an all-encompassing framework; hence a continuum is proposed. The foundation of the continuum is posited as the life process itself, conceived in terms of a dynamic and constantly readjusted tension between mergence (tm) and nonmergence (fm) tendencies (Figure 1). The choice of epistemology depends upon the capabilities of the organism, and in the case of the human, these are influenced by biological, developmental and psychological factors, situational events and environmental context. Yet in spite of the possibility of unique epistemological positions for every human, there is a surprising amount of consensus. This is attributed to a common socialization process, i.e. culture, which can be analyzed in terms of a support system of opportunities, times, roles, environment elements, and environments (Figure 3). This study focuses on the last aspect of the support system, particularly the built environment in terms of its conceptualization, function and organization. It is posited that not only is environment one source of structure, but also

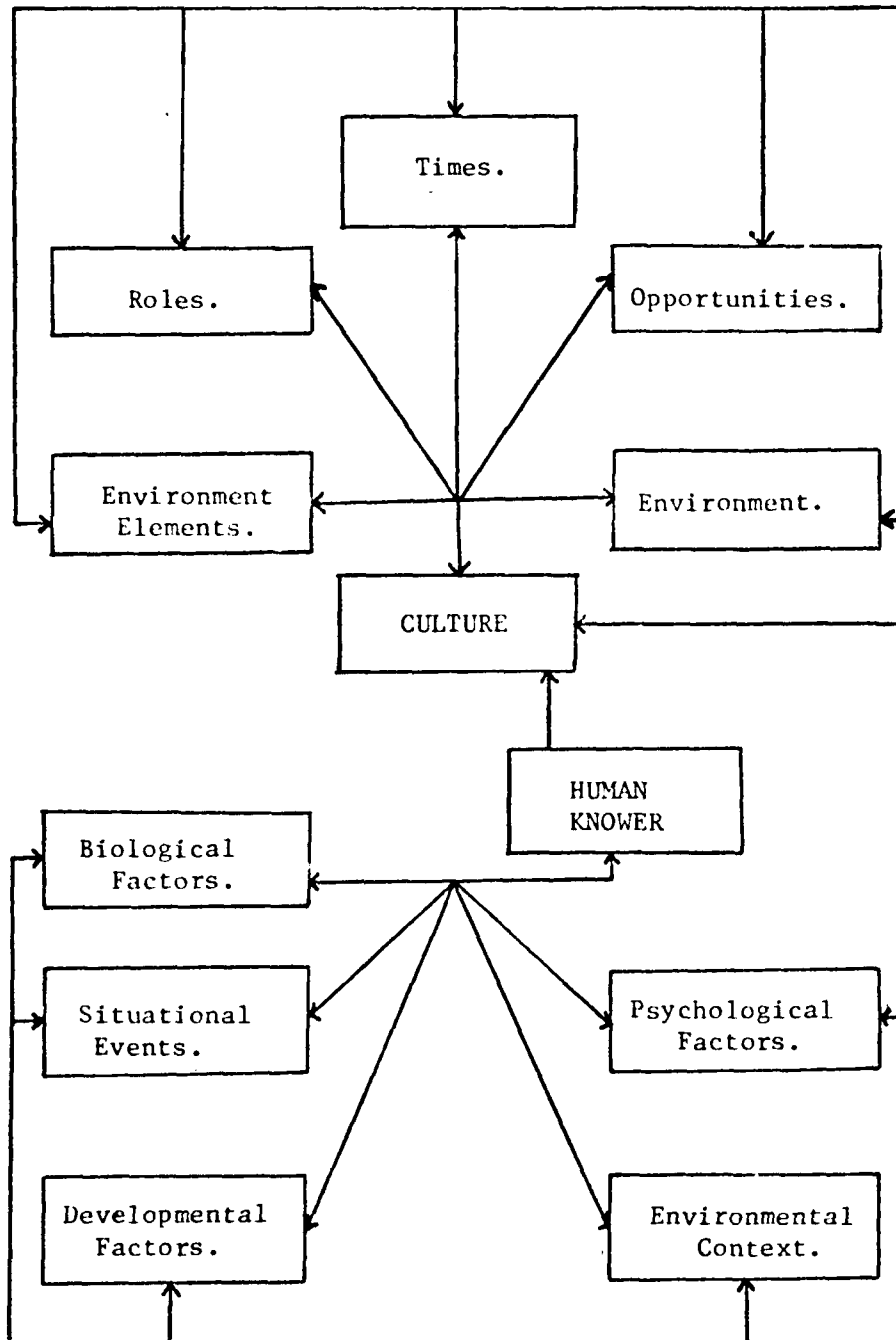


Figure 3: Conceptual Framework of Variables Involved In Environmental Epistemology.

that the construction of environment is one form of evidence of an epistemological position.

In order to test these assumptions, four studies were undertaken in which two different cultures were compared in terms of the relationship between the epistemological position of each and the physical components of its built environment. The methodology employed is described in the next section.

Because the reader may be unfamiliar with many of the terms used in this study, a glossary is provided (pps. 12 - 13).

CHAPTER 2

METHOD

This chapter contains two sections on methodology. First an overview is given to provide the reader with a general understanding of the procedures involved and their sequence. The second section is devoted to an elaboration of all methodological details and considerations.

GENERAL METHOD

In Chapter 1 it was assumed that members of a society formulate and construct components of the built environment in a manner consistent with their worldview. On the basis of this assumption it was hypothesized that in different cultures there will be evidence in the physical components of the built environment which reflect and are reflected in differences in epistemological position. Hence in a test of these hypotheses the need to select two cultures with differences in epistemological position was recognized.

It was also recognized that, for the purposes of analysis, a culture may be viewed as a static entity at any point in time, but considered over a period of time it changes and evolves. Thus if the hypothesis was to hold it must apply to both of these time frames, i.e. to a base time period within which little change occurs and across time periods. Moreover, members of a culture are subject to the influence of other cultures with which they come into contact, and thus this influence would have to be considered. Therefore four studies were undertaken. The Navajo and Zuni cultures were selected, primarily on the basis of differences in epistemology. For both epistemological positions, the implications for the built environment were articulated on the assumption

of consistency between environment and epistemology. These were the criteria against which selected aspects of the built environment were evaluated.

In Study 1 the basic hypothesis, that in different cultures there will be evidence in the physical components of the built environment which reflect and are reflected in differences in epistemological position, was tested by studying these cultures in a base time period, i.e. the earliest period for which reliable ethnographic evidence was available (circa 1885 to circa 1925). Three components of the built environment were selected for comparative purposes. They were: (a) the traditional dwelling unit; (b) the traditional ceremonial unit; and (c) the traditional settlement pattern. Descriptions of each component were compiled for each culture from archival sources and content analyzed according to a standard procedure which had been tested for reliability. These descriptions were compared to the culture's epistemology in order to determine the relationship between the component and epistemology. When each of the cultures had been examined in this way, analogous components were compared across cultures on the basis of their relationship to cultural epistemology. In this way, the differences between the two cultures were discerned.

In Study 2 the hypothesis, that members of a culture subject to contact with those of another would adopt and adapt elements of the (other culture's) built environment in a manner consistent with cultural epistemology was tested. However, the focus was on dwelling unit as representative of an environmental component likely to be under cultural control. The time period selected was circa 1926 to circa 1945, during

which Anglo-American influences were present. The methodology and analytical procedures were similar to those of Study 1, being primarily archival.

Under conditions in which aspects of the built environment were imposed from one culture on another, consistency with the epistemology of the impacted culture was not expected. This was the object of Study 3 which followed the procedure of Study 2, except for the difference in time period. The time period selected was circa 1962 to 1976 during which extracultural influences began to be imposed on the built environments of the cultures in question, in the form of a U.S. Indian housing policy.

Up to this point, the various hypotheses had been tested using content analysis of archives. A more direct method was desirable but was only feasible for a current time period. Thus in Study 4, field methodology was used in Zuniland during the summer of 1976. The purpose of the study was to describe the built environment and examine evidence of the relationship between the built environment and traditional epistemology, and in this way, the relationship was further explicated.

A detailed description of the methodological considerations and procedures of these studies is presented in the next section beginning with a restatement of the hypotheses tested.

METHOD: CONSIDERATIONS AND PROCEDURES

Hypotheses

Three hypotheses were stated: (a) that in different cultures there will be evidence in the physical components of the built environment which reflect and are reflected in differences in epistemological posi-

tion; (b) that members of a culture subject to contact with those of another would adopt or adapt elements of the (other culture's) built environment in a manner consistent with cultural epistemology; and (c) that under conditions in which aspects of the built environment were imposed from one culture on another, consistency with the epistemology of the impacted culture was not expected. In order to test these hypotheses, two cultures were selected for study.

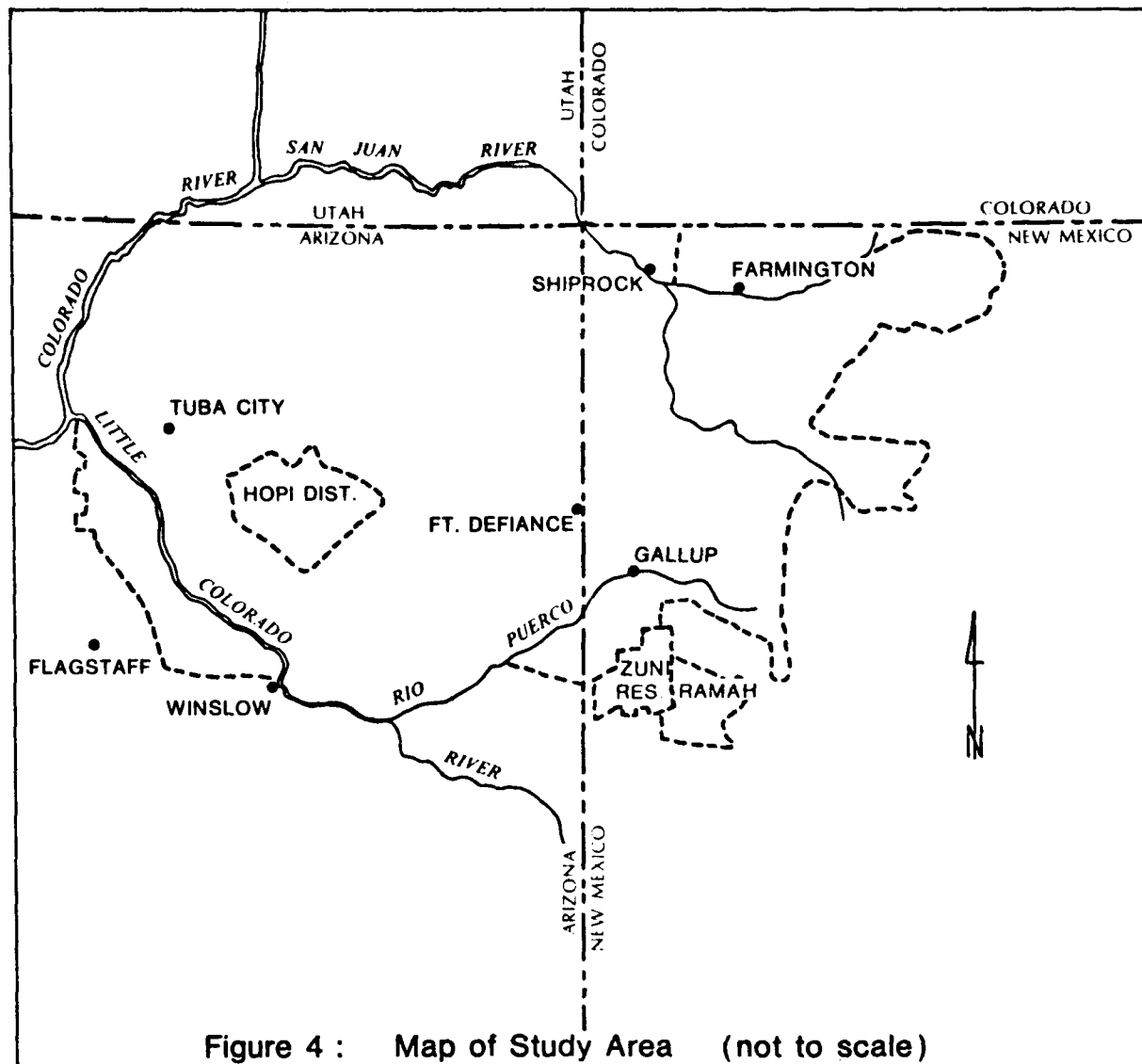
Selection of Cultures

The Navajo and Zuni cultures were selected after consultation with anthropologists and study of anthropological data. First, the issue to be investigated was described to six anthropologists. They were given the selection criteria and asked to name appropriate pairs of cultures for such a study. Each one suggested the use of the Navajo and Zuni cultures. Second after this screening procedure, each criterion was verified systematically, in order to ensure that an appropriate culture pair had been selected.

Seven selection criteria were specified. First, the cultures had to be distinct so that one culture did not stem from the other or they did not have a common stem. Thus Murdock's (1967) Ethnographic Atlas was used to confirm that the cultures selected had at least 1,000 years of separate development. Second, members of the Navajo and Zuni cultures had to inhabit a similar geographical area so that any epistemological and/or built environment differences could not be attributed to a difference in geographical environment. And for ease of access, it was desirable that the cultures be located in North America. The location

is shown on Figure 4. Third, members of the culture had to exist presently so that the tribe could be visited and various aspects verified. This was confirmed in the Human Relations Areas Files (HRAF) -- a selective, cross-indexed file on world cultures. Fourth, since an archival methodology was to be used, there had to be archival data of sufficient quantity and quality from within approximately the same time period, for both cultures. This was verified in the HRAF. Fifth, the members of the culture had to be at the same level of modernization during whatever archival period was selected, for comparative purposes. This was verified in the HRAF (Category 177 -- acculturation and culture change). Sixth, the members of the culture must not use drugs as a culturally accepted means of altering states of consciousness, so that epistemological or built environmental differences could not be attributed to drug-induced states. Finally, appropriate comparable components of the Navajo and Zuni built environment had to be available for comparative purposes. HRAF categories on the built environment were surveyed to: (a) determine the existence of built structures in these cultures (Table A, Appendix I, p.258 ; and (b) to determine their comparability (Tables B & C, Appendix I, pps.259 - 260).

In addition to these criteria, it was desirable that the differences in epistemology of the two cultures be as great as possible for the two cultures chosen, so that comparison would be highlighted. Thus in terms of this study, one culture with an epistemological view oriented more toward the fm tendency was selected and also one oriented more toward the tm tendency. This was verified in the HRAF using data categories related to epistemology (Table D, Appendix I, pps.261 -262).



Epistemological Positions of Selected Cultures

To assess the environmental epistemology of a culture, we must know about its worldview: its assumptions, the elements of which its universe is comprised, its focus, its purpose or goal, and the relationship among elements in terms of its focus and goals. This will be the order in which the aspects of worldview will be described for both the Navajo and Zuni cultures.

Navajo Epistemological Premises

The basic assumption of the Navajo worldview is that the universe is chaotic. It is a mixture of human and nonhuman elements (Reichard, 1950). A human being, or earth surface person, is one who speaks and has a body and soul (Haile, 1943; Kluckhohn & Leighton, 1946; Reichard, 1950). The body is viewed as a series of fitted layers of tissue, internal organs, bones, flesh, and skin completely controlled by a wind soul (Reichard, 1950). It enters the body at birth, through an orifice, and accounts for one's being an earth surface person (Haile, 1943). The arrival of a wind soul is likened to "intrusion of a foreign being. [It] is corporeal because 'you can feel this wind in you when you breathe' The term, . . . 'standing within something' leaves no doubt about its form and shape, . . . it lives . . . [and] . . . grows . . . [having] . . . the form of the . . . body [it occupies]" (Haile, 1943, pps. 82 - 83). Although physical development is ruled by a small wind which enters the fetus sometime after conception, the wind soul coordinates all components -- the body, vegetative wind soul, and other aspects over

which one has control (e.g. thoughts, names, dreams, songs) -- so that they function as a unit (Haile, 1943).

The human is highly dependent on the soul for its health and ultimately, for its life. When the wind soul is undermined or leaves, the human is in grave trouble. When the human is fearful or when confidence is weakened, s/he is subject to invasion, through whorls and orifices, by forces which travel between the layers of body tissue (Haile, 1943; Reichard, 1950). Evidence that one has been invaded, and thus lost control, is shown in sickness, accident or bodily misfortune. Systemic balance can be restored through ritual coercion in which these forces are propitiated (Haile, 1943; Kluckhohn & Leighton, 1946). The nature of this coercion is through the mediation of an immune, i.e. holy, individual known as a Singer. This is possible because of the soul's intimate link with breath, i.e. one's wind, and sound and thus to language, prayer and knowledge. Such a human, meaning that s/he is healthy and has the linguistic abilities and requisite knowledge, can appease the foreign forces and rid the human of them without endangering her/himself. Thus it is possible to get rid of the invaders through a Sing or healing ceremony, even if it is not always possible to prevent them from invading in the first place (Haile, 1943). When the wind soul leaves through the fingertips, the human dies. The body shell is dangerous for it is empty and thus can contain evil forces (Newcomb, 1940). We speculate that the corpse is conceived of as having more emptiness than a living human, thus more chance of invasion. Therefore, contact with the dead is feared and avoided, since it is an invitation to loss of control (Newcomb, 1940; Reichard, 1950).

There are two kinds of nonhuman beings: deities, and plants and animals. The former are beings whose inner forms are closely related to, though not exactly the same as, certain environmental elements such as the sky, earth, and sun (Haile, 1943). The latter are nonspeakers, that is to say, after the earth surface people were created, other elements ceased to appear in human form (Haile, 1943). However, after humans have made use of it, the animal or plant returns to its human form (Haile, 1943).

Since the world was created for human benefit, the worldview is anthropocentric (Reichard, 1950). Humans are able to use everything, for everything has some human use. The goal of the human is twofold: present stability, and future oneness with all things (Reichard, 1950). In terms of the present goal much has been achieved, for the world has been made more stable and predictable through the use of control measures; hence a view of good and evil in terms of locus of control. Good is that which is under control; bad is that which is not. Control is achieved through knowledge of universal laws which the human acquired through experience and supernatural aid, and knowledge is power. Thus it can be inferred that the increase in human knowledge is a measure of progress; with this increase the human has been transformed, almost to the point of deification.

The relationship of humans to nonhuman deities is of an intimate, almost inseparable nature. However, this does not imply that deities are solely wiser, benevolent helpers. They are classed into three groups: persuadable, undependable and unpersuadable, in terms of the human's knowledge of how to ritually control them. It is not how much

the deity knows, but rather how much the human knows in relation to the deity, that is important in understanding this relationship (Reichard, 1950).

Similarly the human's relationship to animals and plants is determined by relative power. Originally animals and humans were equal. The animals became human, i.e. became the people of the animal clans of the tribe, and lower organisms inhabited the animal forms (Newcomb, 1940; Yazzie, 1971). The ultimate goal of oneness with all things can be thought of as leading to an identification of the human with certain animals. For example, identification based on implied similarity is exemplified by the taboo against harming one's own dog, which Newcomb (1940) interpreted as implying that the fate of the two are closely related. Plants are highly respected (Reichard, 1950) and there are human-plant identifications similar to those with animals (Newcomb, 1940). Yet there is less intimacy with plants than with animals, especially the animals of myth (Haile, 1943). Each animal and plant has its own gifts and powers, such that whether one is superior to another depends on the relative powers of each in terms of the particular circumstance.

In summary, based on the literature cited, it is concluded that the premises of the Navajo worldview deal with oneness, order and control, as interpreted from an anthropocentric focus. The world is conceptualized as a mixture of human and nonhuman elements whose ultimate goal of universal oneness is yet to be achieved; at present they are in need of order. Order is conceived of in terms of the maintenance of stability through the division of the universe into groups of elements in which

internal sequence is emphasized (Haile, 1943), and through advances in human knowledge (Reichard, 1950). Knowledge is thereby a source of power and control whose importance is stressed because of the permeable nature of the human being to controllable and uncontrollable forces. Every element has its place in the scheme. Each is similar in terms of its past or future relationship to the human, and is presently thought of in terms of human utility; hence an anthropocentric focus. In spite of an acknowledged closeness between the human and certain nonhuman elements (e.g. game animals, deities), deities are considered to be more powerful than humans.

It is possible that this worldview was related to the traditional economy which focused on hunting and gathering, with some animal husbandry (sheep and goats) and cereal farming. With this economic base an accident or illness of an individual would be critical, since a sick hunter is unable to procure sustenance for the group. A hunter must be self reliant yet understand the constraints of the elements to be successful, hence the anthropocentric focus accompanied by an ambivalence and respect for the superior nonhuman. This is also consistent with an orientation which tries to maximize individual control and minimize the vicissitudes of the nonhuman environment. A focus on hunting is in agreement with an emphasis on forming relationships with animals rather than plants.

Zuni Epistemological Premises

In a manner similar to the previous section on Navajo epistemology that of the Zuni will be described.

To the Zuni, the world is an organic whole of balance and harmony (Bunzel, 1932; McFeat, 1960). Everything has its place and all are

unified, for all are alive. The constituents of this universe are human and nonhuman, although this was not always the case for there was a more fluid time when beings were allowed to change shape at will (Bunzel, 1932; Cushing, 1896; Zuni People, 1974). The human has a human body which can be left in certain instances (e.g. dreams), but the most important feature is the heart which can will things to happen (Bunzel, 1932). It is the measure of strength. Nonhumans are plants, animals and environmental elements. Animals and some plants are humans in disguise, who resemble humans only when they are at home (Bunzel, 1932; Zuni People, 1974). Other nonhumans are deities. The focus of this view is not on a particular element but on the systemic whole. Thus each element must help to maintain this order through cooperation.

Human knowledge of this order is intuitive, one of the five ways in which humans can know (Waters, 1950).

The human has limited but nevertheless important influence necessary for universal functioning, through the use of the will. To be unable or unwilling to use it for this purpose is to neglect duties to oneself, one's group and the universe. Thus all elements are interdependent and in this sense, equal, for each needs the others so that balance is maintained (Bunzel, 1932). In terms of the human, this is exemplified by a human-nonhuman kinship through clans which have nonhuman kin and special relationships with them (Kroeber, 1917). Plants are especially revered, as corn begat the Zuni tribe (Levi-Straus, 1958; Stevenson, 1915).

In summary, based on the literature cited, it is concluded that the premises of the Zuni worldview are order and oneness, from a nonhuman perspective. The Zuni world is a nonhierarchically ordered universe of

human and nonhuman elements. Because everything is alive, each shares the essence of life and is thereby equal with every other element; hence an emphasis on organic harmony. All are interdependent and work for the good of all. The human role is one among many, each necessary but not sufficient by itself to maintain universal balance.

It is possible that this worldview was related to the traditional Zuni agricultural economy which was based on the intensive cultivation of maize, squash, beans and some fruits. Knowledge of and respect for the earth, stress on rain and understanding of the seasons are logical consequents. Moreover, the survival of the group is dependent upon cooperative effort consistent with an harmonious, organic worldview. A special respect for plants is not surprising in this viewpoint.

Comparison of Epistemological Premises

In comparison, the epistemological premises of the Navajo and Zuni cultures differ. There are subtle differences in premise content, in addition to a difference in focus from which the world is viewed. In both cultures, two superficially similar premises, oneness and order, are explicated. The union of all things is a goal of both; the Navajo are waiting to achieve it at some future time (Reichard, 1950), whereas it is considered already attained at Zuni (Bunzel, 1932). Therefore the Navajo presently conceive of unification on a small scale as in the union of bodily constituents (Haile, 1943); but the Zuni conceptualize universal oneness (Bunzel, 1932; Cushing, 1896). Similarly, order and an emphasis on sequence are part of both epistemologies (Bunzel, 1932; Cushing, 1986; Haile, 1943; Stevenson, 1915; Reichard, 1950). Elements are divided into groups in both systems, each group having a certain status. Navajo groups are hierarchic in that they are based on relative

power (Reichard, 1950). When sequences are considered within groups, the relative goodness and powers of the elements within the sequence are stressed, as in the good sequence -- east, west, south, north -- of cardinal points as opposed to the malevolent sequence -- any other order (Haile, 1943; Reichard, 1950). In contrast, Zuni groups are nonhierarchic in that similarity in life essence and mutual need is stressed (Bunzel, 1932). Moreover, although sequence is a factor in Zuni viewpoint, interdependence of elements seems to be emphasized (e.g. the importance of all four cardinal points in defining space). There is an obvious difference in focus, for the Navajo concentrate on the human and the Zuni on the nonhuman. To the Navajo, everything is conceived in terms of the human; even the more powerful, nonhuman deities are considered in terms of their power relative to the human (Reichard, 1950). This differs from the Zuni who focus on the nonhuman, that is on the system as a totality rather than on a particular element (Bunzel, 1932; Cushing, 1896). Thus, where the human 'is the measure of all things' to the Navajo, the human is a small though nevertheless important element of the Zuni world. By implication then, the nature and degree of human-nonhuman intimacy differ as well. In spite of similarities between human and nonhuman elements in Navajo culture, a distinctness is maintained between them. For example, humans are like deities having learned from them various kinds of knowledge to control elements of the universe. Yet humans are not deities; they are merely human. In contrast, inseparability of elements is emphasized in the Zuni system by virtue of its interdependent nature. Living and dead, animate and what the Western world would consider inanimate, are all related. Thus, in relation to

each other, the Navajo culture could be categorized as epistemologically dualist, fm-oriented and, by implication, objectivist and the Zuni, as holistic, tm-oriented and, by implication, subjectivist.

Criteria for Comparisons of Epistemology
and Built Environment

A range of possible outcomes for each epistemological premise was delineated as a basis for comparison with results. For each epistemological premise, implications for the built environment were developed on the assumption of consistency between the two and organized in terms of: conceptualization, purpose, and organization. As stated in Chapter 1, these terms are defined as follows: (a) conceptualization refers to the way in which the built environment is viewed, its meaning and significance; (b) function refers to its purpose or use; and (c) organization refers to the relationship among constituent parts --both in terms of the relationship among elements which comprise its physical appearance, and in terms of patterns of use. The implications of each premise in terms of these aspects of the built environment are elaborated below.

Implications of Navajo Epistemological Premises for the Built Environment

As previously stated, Navajo epistemology dealt with premises of order, control and oneness interpreted from an anthropocentric focus. Each premise will be elaborated in terms of its implications for the conceptualization, organization and function of the built environment.

First, the Navajo premise of order was one of stability. Thus a built environment exemplifying this premise would also be conceived of as manifesting this kind of stability. As interpreted from a Navajo standpoint, the grouping of environmental components and the sequences

of those groups would be stressed. Moreover an orderly sequence of groups would be envisaged as one which gives the human a sense of place. In terms of organization, a built environment exemplifying this kind of order would be formulated, constructed and used according to specific plans or a sequence. The stress on orderly development would likely preclude variation within structure types. Again, the grouping of structures arranged in hierarchical sequence would be evident. In terms of purpose, a built environment would have the function of maintaining stability and order. Thus it is likely that each structure would have a specific use and that structures might be divided by their function into some kind of orderly sequence. In these ways a built environment could be consistent with the Navajo interpretation of order.

The second premise, control, was extremely important in Navajo epistemology. A built environment consistent with this would conceptually place importance on locus of control. Because of Navajo concern with falling out of control, it is likely that the built environment would be conceived as a source of control with an emphasis on controllable structures or features. Moreover, environments or features considered to emphasize the uncontrollable would likely be avoided or destroyed. In terms of organization, the use of definite boundaries could help maintain controllability. Moreover it is likely that environments would be built to have controllable features, and that which is beyond control would be avoided. In terms of function, an environment which is built to establish and maintain control over the uncontrollable would be consistent with the Navajo concern about control. Thus there are several ways in which the built environment could manifest this premise.

The third premise was that of oneness on a small-scale. A built environment which was conceived of as representing small-scale unity would be consistent with this premise, especially if environment structures were discrete totalities. The organization of the built environment could manifest oneness in the use of a single structural detached form, particularly circular. Since the emphasis is on small-scale unity, it would not be surprising to find that the aspect of the built environment which organized it as a unified whole would not be as apparent with increasing scale. Consistent with oneness would be multiple function environment structures which serve all purposes for the members of the culture.

The anthropocentric focus of Navajo epistemology could be manifest in a built environment in which every structure or feature would be conceived in terms of human use or benefit. It could be organized in terms of human utility, by and for human use.

The notion of the nonhuman as more powerful than the human could be manifest conceptually in the built environment in several ways. The reader will recall the three kinds of superior nonhumans: unpersuadable, persuadable and unpredictable. Concomitantly, environments could be thought of as a means for escape from unpersuadable nonhumans, as an alliance with persuadable deities or as somewhat ambivalent (as in unpredictable deities). In organizational terms, an environment designed as an escape could have impermeable boundaries to prevent nonhumans from entering and indeed might be organized to make nonhumans unwelcome. Moreover any sites or features indicative of these kinds of nonhumans could be avoided. An environment thought of as a means of alliance

could have permeable boundaries to allow accessibility for its allies. Such deities might be incorporated into the building process and their alliance might be used against the unpersuadable deities. An environment manifesting ambivalence might vacillate in organization between the first two, i.e. have components or features consistent with both. In terms of its function, an escape environment would be to keep nonhumans out and an alliance one to allow nonhumans in. Ambivalent environments might be used in both ways.

Navajo epistemology placed emphasis on human intimacy with deity. This could be manifest in a built environment conceived in such manner that those of the deities were similar to those of the humans. It could be organized like the alliance environment described above and would have a religious function. Finally, the stress on a closeness with the animals of myth would require an environment conceived in terms of such a relationship. There could be similar environmental structures for both and they could even be shared. Animals might be incorporated into the building process and their buildings might even receive more prominence than those of humans. Such structures might have human and animal uses.

Thus, it is possible to have a built environment which would be consistent with the premises of Navajo epistemology. These implications are summarized in Table 1 (pps. 54 - 55) and form the criteria against which selected components of the Navajo environment were evaluated.

Implications of Zuni Epistemological Premises for the Built Environment

As previously stated, Zuni epistemology dealt with premises of oneness, interdependence, harmony and order interpreted from a nonhuman focus. Each premise will be elaborated in terms of its implications for

Table 1

Criteria Table: Implications of
Navajo Epistemological Premises for
the Built Environment

Epistemological Premise	Implications for the Built Environment		
	Conceptualization	Organization	Function
Order; stability.	Environment or component conceived of as manifesting stability. Sequences of groups important for stability. Orderly sequence of groups give one a sense of place.	Specified plans for the formulation, construction and use of the built environment. Little variation within type of structure of built environment. Environment structures divided into groups, arranged in sequence with stress on hierarchy.	Environment's purpose is to maintain stability and order. Each structure may have specific uses; structures may be divided by function in sequence.
Control.	Locus of control important in environment. Emphasis on controllable environments and/or features thereof. Environment considered a source of control. Emphasis on avoiding or destroying uncontrollable environments and/or features.	Definite boundaries to maintain controllability. Use of controllable features. Avoidance of that which is beyond control.	Establish and maintain control over the uncontrollable.

Oneness on a small scale.	Unification on a small-scale. Environment structures considered as totalities.	Use of single structural form. With increasing scale, elements which unify less frequent.	Multiple function environment structures.
Anthropocentric focus.	Every environment and/or feature for the use or benefit of human.	Organized in terms of human utility, by and for humans.	For human use, mainly. Human utility stressed.
Nonhuman more powerful than human.	Environments thought of as: (a) an escape from nonhumans (as in unpersuadable deities); (b) as an alliance with nonhumans (as in persuadable deities); (c) as ambivalent (as in unpredictable deities).	(a) Impermeable boundaries to prevent nonhuman infiltration. No such nonhumans allowed. Avoidance of sites and/or features indicative of these nonhumans. (b) permeable boundaries to allow allies access. Use of deities in building process and form to strengthen against (a). (c) Vacillating between (a) and (b).	(a) To keep such nonhumans out. (b) Allow nonhumans in and ally human with them, especially versus (a). (c) Ambivalent.
Intimacy with deity.	Human closely related to deity. Environments for humans likened to those for deities.	As in (b) above. Similar to those of deities.	Religious.
Close relationships with animals.	Environments for animals and humans closely related.	No difference between form of human built environment and animal built environment. Animals may live with humans. Incorporate animals in building process. May be emphasis on built environment for animals.	Environments for animal and human use together.

the conceptualization, organization and function of the built environment.

The Zuni premise of oneness was of universality in which everything was inseparable. Thus a built environment conceived of as inseparable from the rest of the world would be consistent with this premise. Similarly it could be organized as a totality, i.e. one built environment for all humans and nonhumans which, though recognizable as a whole would blend in with the surroundings. Holistic functioning of this environment implies that all necessary functions can be met within this totality or environmental unit.

The premise of interdependent elements is consistent with an environment whose elements are conceived of as interdependent. Each could be viewed as needing others of similar or different kinds to complete the whole. Thus it would be organized in a way in which such elements are interconnected or linked. Interdependency of functions of built and nonhuman environments may be the basis for their integration. There could be multiple related functions within one unit or grouping of units.

To the Zuni the universe is alive so that there is organic harmony of all things which have the essence of life. A consistent built environment would be conceived as a living organism, possibly having a regenerative cycle of growth, development, death and renewal. Such an environment could be organized like a living system of interconnected, interdependent parts some of which might grow or decay; and organic materials might be used. In terms of function, such an environment might be treated like a living being. For example, it might be fed, washed or repaired.

The premise of nonhierarchic order could be manifest in an environment conceived as a composite of elements of equal status. Similarly the elements or structures could be organized into groupings of similar status, hence lateral rather than vertical differentiation. Different units may serve different but equivalent tasks and functions of these units may be related to their purpose in being ordered.

Finally, the nonhuman focus of Zuni epistemology could be exemplified in a built environment conceived of as part of the nonhuman environment -- in which the nonhuman is stressed. It could be organized in terms of minimal impact on either the human or nonhuman environments. A major role could be assigned to the nonhuman in the formulation and construction of the built environment. Functionally, environments for nonhumans might take precedence over and coexist with environments used for human ends.

Thus it is possible to have a built environment which would be consistent with Zuni epistemology. These implications are summarized in Table 2 (p. 58) and formed the criteria against which selected components of the Zuni environment were evaluated.

Study 1

In this study, whether or not congruence existed between the epistemological premises and selected components of the built environment of the Navajo and Zuni cultures was determined, during an archival time period, circa 1885 to circa 1925. The base date, circa 1885, marked the beginning of ethnographic studies of these cultures. The end date marked the beginning of the mention of built environment changes attributable to contact with Anglo-Americans.

Table 2

Criteria Table: Implications of
Zuni Epistemological Premises for
the Built Environment

Epistemological Premise	Implications for the Built Environment		
	Conceptualization	Organization	Function
Oneness: universal; inseparable.	Built environment thought of as inseparable from rest of world. Emphasis on uni- versal totality.	Totality; one built environment for humans and nonhumans; recognizable as a whole, yet blends with surround.	All functions met within this totality or environ- mental unit.
Interdependence of elements.	Elements of structures in the built environment are interdependent. Each unit viewed as needing others of same and/or different kinds to complete the whole.	Elements or structures in built environment are interdependent, inter- connected or linked.	Interdependency of func- tions of built and non- human environments may be basis for their integra- tion. Multiple, related functions within one unit or grouping of units.
Organic harmony of life essence. The universe is alive.	Built environment is a living organism. It has a regenerative cycle, i.e. it grows, develops, dies, renews.	Organization like a living system of interconnected, interdependent parts. Organic growth and decay. Use of organic materials.	Treated like a living being (e.g. fed, washed).

Nonhierarchical order.

Environment is a composite of elements or structures of equal status.

Elements or structures divided into groupings of similar status. Lack of vertical integration. Lateral differentiation.

Different units may serve different but equivalent tasks. Functions may be related to purpose in ordering.

Nonhuman focus.

Built environment is part of nonhuman environment which is stressed compared to human environment.

Minimal impact by human on nonhuman environment in terms of construction. Major role assigned to nonhuman in formulation and construction of built environment.

Environments for nonhumans take precedence and coexist with environments for human purposes.

The procedure consisted of seven steps. First, the components of the built environment were selected for study. Second, a data collection procedure was developed. Third, the procedure was tested for reliability. Fourth, the data sources were selected. Fifth, an appropriate built structure was chosen for each environmental component selected in Step 1. Sixth, the data on each built structure was organized into a normative building code. Finally, this code was compared with the appropriate criteria table, in order to determine the relationship between built environment and epistemology in each culture. Details of each step are elaborated below.

Step 1: Selection of Built Environment Components

The Human Relations Areas Files (HRAF) -- a cross-referenced guide on selected cultures was used to determine which components were appropriate, i.e. available and comparable (Tables B & C, Appendix I, pps. 259 - 260). On this basis, the components selected were: (a) dwellings; (b) religious structures and (c) settlement patterns.

Step 2: The Development of a Data Collection Procedure

An Archival Data Collection Form (ADCF) was developed so that information could be catalogued under relevant topics (Appendix I, pps. 269 - 275).

The form encompassed three major categories: (a) components of the built environment (Section A); (b) cultural epistemology (Section B); and (c) the culture in general (Section C). Several headings and subheadings were added to aid in finding the appropriate area for cataloguing a passage.

The procedure basically consisted of reading selected passages and placing words and phrases under the appropriate headings of the form. A copy of the instructions is found in Appendix I (p.266).

Step 3: Reliability of the Data Collection Procedure

The ADCF procedure was tested for reliability three ways. First, a pilot study of 25 randomly selected HRAF cards was undertaken with two raters, as a basis on which to clarify the ADCF and the instructions for its use. The raters had experience in undergraduate anthropology, but not in the cultures in question. The pilot study indicated that the procedures were clearly articulated.

Second, five raters were asked to catalog 100 randomly selected HRAF cards using the ADCF and procedure outlined above. These raters were advanced undergraduate anthropology students not specializing in the Navajo or Zuni cultures. Results were analyzed for the degree of agreement on coding each passage in terms of: (a) placing parts from the HRAF passage in major sections of the ADCF (Section A: components of the built environment; Section B: cultural epistemology; Section C: the culture in general); (b) placing parts from the HRAF passage under subheadings of the ADCF; and (c) placing specific words of the HRAF passage under subsections of the ADCF. Statistical procedures are outlined in Appendix II (pps. 283 - 284) and consisted of Chi-square transformed into z scores, and percentages.

The statistical procedures used have certain assumptions. They are as follows: (a) that each word has an equal weighting with every other word in the passage; in no way is the effect of the grammatical context of a word evaluated; (b) that complexity of a passage can be determined

quantitatively (as indicated by the number of words in a passage or the degree of reliability of a passage); (c) that each word has an equal chance of being placed in any subsection of the ADCF. Statistical procedures for content analysis have not been developed to the point where it is possible to assume otherwise. The analytical procedures used give the reader an indication of relative reliability. This is particularly apparent in the procedures regarding the percentage calculations where the possible range was from 20% to 100%. The rationale for the range is included in the outline of statistical procedures (Appendix II, pps. 283 - 284).

Hence the results of these reliability studies should be considered at best an indication that people who were not cognizant of the hypotheses of this study were able to break randomly selected passages up and place them in subsections of the ADCF, in a relatively similar manner.

Because of the labourious procedures involved in the analysis, only 32 passages from the first, middle and last of the study, were analyzed. Results indicated that content analysis could be done in a consistent manner and that the degree of reliability improved with additional training and practice.

Results were as follows: (a) the mean of the z scores regarding the placement of parts of the HRAF passages into sections of the ADCF was 4.81 (Table A, Appendix II, p. 285); (b) the mean reliability regarding the placement of passages into subsections of the ADCF was 88.19% (Table B, Appendix II, p. 286); and (c) the mean reliability regarding the placement of exact words into subsections of the ADCF was 66.20% (Table C, Appendix II, p. 287). These results showed that reliability decreased

as the coder was required to make finer discriminations in the coding categories. It was decided that with additional training this last reliability could be improved. The results of the next reliability study, outlined below, attested to this.

The third reliability study dealt with consistency of the ongoing use of the ADCF for this research over time and was tested at monthly intervals.

A random sample of 10% of the HRAF passages that had been coded during the previous month, were selected. One rater (who had the greatest degree of agreement with the group norm in the previous study) was chosen. She was given the same instructions as in the previous study. Then 10 sample passages were catalogued independently. After each was coded, the cataloguing was compared and disagreements were discussed. Then the rater read and catalogued the required passages. Results are indicated below.

Time 1. The mean reliability regarding the placement of passages into sections of the ADCF was 96.82% (Table D, Appendix II, p. 288); the mean reliability regarding the placement of passages into subsections of the ADCF was 98.84% (Table E, Appendix II, p. 289); and the mean reliability regarding the placement of exact words into subsections of the ADCF was 77.30% (Table F, Appendix II, p. 290).

Time 2. The mean reliability regarding the placement of passages into sections of the ADCF was 100.00% (Table G, Appendix II, p. 291); the mean reliability regarding the placement of passages into subsections of the ADCF was 99.06% (Table H, Appendix II, p. 292); and the mean reliability regarding the placement of exact words into subsections of the ADCF was 83.85% (Table I, Appendix II, p. 293).

Time 3. The mean reliability regarding the placement of passages into sections of the ADCF was 100.00% (Table J, Appendix II, p.294); the mean reliability regarding the placement of passages into subsections of the ADCF was 80.64% (Table K, Appendix II, p. 295); and the mean reliability regarding the placement of exact words into subsections of the ADCF was 98.39% (Table L, Appendix II, p. 296). The decrease in the second form of reliability at this time period was attributed to the selection of comparatively ambiguous passages.

Step 4: Selection of Data Sources

Selection of sources was initially based on the HRAF. The method of category selection was based on relevance, i.e. the category had to concern the built environment, epistemology, or general information (Table D, Appendix I, pps. 261 - 262). Additional references included:

(a) Harvard University, Peabody Museum of Archeology and Ethnology.

Catalog. Boston: G.K. Hall, 1963 & 1970;

(b) Murdock, G.P. & O'Leary, T.J. Ethnographic Bibliography of North America (4th ed.). New Haven, Conn.: HRAF, 1975;

(c) Dockstater, F.J. The American Indian in Graduate Studies, a Bibliography of Theses and Dissertations. New York: Museum of the American Indian, Heye Foundations, 1950, and Supplement. 1965 - 1970, 1973;

(d) appropriate journals such as American Journal of Anthropology, El Palacio and Museum Notes of the Museum of Northern Arizona.

Works surveyed included: (a) any of a general nature about the culture (e.g. Kluckhohn's & Leighton's book, The Navajo (1946)); and (b) those whose title and/or abstract mentioned the built environment and/or

epistemology of the cultures in question (e.g. Corbett's article, Navajo house types. El Palacio, 1940, 47, 97 - 107).

It is important to acknowledge the commonality between sources used to determine the epistemological premises and the description of the built environment, for both relied on the HRAF. For example, Cushing's works are cited in both sections and it is questionable whether he was able to treat epistemology and built environment as independent entities in his investigations. This possibility is endemic to a study of this nature which relies on archival evidence of ethnographers with a wide variety of interests.

Recognizing this possibility a number of checks were introduced to help ensure that epistemology was as independent as possible of environment, first in the use of the HRAF, second in the degree to which a statement was accepted as fact and third in the use of other evidence on the built environment.

The HRAF is divided into separate categories containing information from several studies relevant only to the category under examination. Thus in gathering data relevant to epistemology (which temporally preceded the gathering of data on the built environment) explicit reference to the built environment were not available in the categories utilized. It could be argued that the context of the passages so catalogued implied a certain understanding based on the built environment.

It seemed reasonable as the criterion for accepting information to consider as fact, something mentioned by three or more researchers. It was impossible to meet this standard when solely relying on the HRAF; there were not always three researchers who had studied the same feature. The use of

additional sources greatly enhanced the ability to meet this standard. In many cases, one work would be cited as the authoritative source. It seemed that if major work had been undertaken by one researcher, no one bothered to follow it up. For example, the Mindeleffs' works on architecture were cited by others, but seemed to be considered the classics. There were no replications, though someone might mention certain environmental features which did or did not agree with the findings, in another study. Moreover when disagreement occurred it was difficult to discern who was right, for the authority of works varied; in this case the HRAF categorization of quality of work was taken as a rough index of the worth of a work. Yet even if a researcher was noteworthy, it could be the case that a particular finding was not correct. Thus although conflicting statements and interpretations are presented, no attempt was made to choose one over another.

Third in addition to written materials, sketches and surveys of the built environment made in the archival period were used as evidence.

There was also the problem of bias. In many cases this could be discerned by the presence of value-laden statements, in addition to the rather different interpretations of researchers depending on their background (e.g. missionaries referring to natives as heathens). However, the implicit biases of the Western tradition of data gathering could not be partialled out so easily. It became very apparent that there was no such thing as a real fact, apart from the researcher who gathered it. For example, different researchers could view the same thing differently because they were trusted in different ways by the members of the society they studied and thus were acquainted in different ways with certain aspects of the culture.

Studies by those without anthropological backgrounds also gave evidence of methodological difficulty. For example, cultural context was not sufficiently acknowledged, such that the meaning of particular environmental features within the framework of a culture was not indicated. If the researcher does not give acknowledgement of the cultural context of an environmental feature, it is difficult for the reader to discern the role of this context (and whether or not the researcher was indeed aware that it might be important). Moreover, regional bias was particularly apparent. This was especially important in dealing with the Navajo culture whose members inhabit four U.S. states. There is the possibility of distinct regional differences (which have often been remarked upon by anthropologists) which have not been explicated. The danger in generalization beyond the region to which a finding applies, is obvious.

Step 5: Selection of an Appropriate Built Structure For Each Environmental Component

Once all the data had been gathered, those dealing with built environment structures were organized in the following manner. The built environment was separated into components (previously selected in Step 1): dwelling structures, ceremonial structures, settlement patterns and others. Each structure that had been mentioned in the sources was placed under the appropriate component (Tables B & C, Appendix I, pps. 259 - 260). For example, Shalako house and pueblo house were both placed under the component Zuni dwellings.

As the basis for selection of a built structure within each component, a frequency measure was used in conjunction with a measure of

significance. The measure of frequency was taken as the number of sources in which reference was made to a particular structure. Then within each culture these frequencies were ranked, leading to a relative order. It should be noted that in the sources used, there was little environmental information of any kind. With the exception of a few papers devoted exclusively to environmental features, most of the cross-cultural works dealt with other aspects of the societies in question. On occasion a researcher would mention an environmental feature in passing. Those features that were mentioned frequently were not necessarily the most culturally significant or abundant; most likely they were a reflection of the interests of the researcher. It was very possible that much information about the environmental components in question was not included in the research. For example, the fact that the function of a feature of the dwelling is not mentioned in this paper reflects missing data. It does not exist either because researchers were not looking for it or they did not regard it as significant to their studies and therefore did not report it. However, no other way of determining frequency was available.

In addition, a note was made regarding the cultural significance of the component, as specified in the sources. Agreement of at least three sources regarding the importance of the structure was required. There were no instances of disagreement. Thus, for each structure there was a relative ranking and a notation about its significance.

Then within the component, the structure with the highest ranking and most significance was selected for detailed analysis. In cases in

which ranking and significance were not consistent, the structure of greater significance was selected.

Step 6: Organization of Data on Selected Structures into a Normative Building Code

Data for these structures was taken from the ADCFs and organized into tables. Each table was concerned with the specific physical and specific social features of the structure -- their conceptualization, purpose and organization. This format is shown in Table E (Appendix I, p. 263). Since each table contained the norms and taboos regarding a particular built structure it was termed normative building code.

The structures chosen were:

- (a) Navajo female hogan and Zuni Shalako house for dwelling component;
- (b) Navajo male hogan and Zuni kiva for ceremonial component; and
- (c) Navajo cluster pattern and Zuni pueblo for settlement pattern.

Support structures, such as ovens and corrals, were considered in relation to the relevant, selected structures.

Step 7: Comparison of Normative Building Code and Criteria Table

For analysis of the relationship between built environment and epistemology, the normative building code for each structure was compared with the criteria table (Tables 1 and 2, pps. 54 - 55, 58 - 59) on the implications of the epistemological premises for the built environment. For each premise, each category of the data table was examined in terms of its consistency with the comparable implication category of the criteria table (e.g. items under the conceptualization column in

the data table were compared with implications for conceptualization from the criteria table). In this way, an assessment was made for each premise as to whether consistency was exemplified in: (a) specific features of a specific structure in a specific category (e.g. function of the door of the male hogan compared to implications for function in criteria table); (b) specific features of a particular structure across categories (e.g. organization, function and conceptualization of the door of the male hogan compared to implications for organization, function and conceptualization in criteria tables); and similarly (c) structures, as a whole, were compared to the criteria tables within and across categories. On this basis, it was possible to speculate about the degree of consistency of the particular premise in the built environment of the culture. Similarly, on the basis of the results for all premises, the consistency between epistemology of the culture and each of the selected components of the built environment was assessed. From this, overall consistency between epistemology and the built environment was speculated upon.

In this way, data were collected and analyzed to test the hypothesis that in the Navajo and Zuni cultures there will be evidence in the physical components of the built environment, during the period circa 1885 to circa 1925, which reflected and was reflected in differences in epistemological position.

Study 2

This study focused on the hypothesis that members of cultures subject to contact with those of another would adopt and adapt elements of the (other culture's) built environment in a manner consistent with cultural epistemology.

The time period chosen was circa 1926 to circa 1945, when Anglo American culture impacted on the Navajo and Zuni but no concerted effort was made to influence the built environment.

The dwelling unit was studied as that component of the built environment over which the tribal culture had a degree of control and as that component in which the acculturative process could manifest itself. Because the family unit is the basic transmitter of traditional culture (Steward, 1963) being the basic unit of socialization, it was assumed that dwelling form (the environmental form concomitant with this social form) would be an environmental component under cultural control. Further it was assumed that it would be the component in which the concomitance between traditional epistemology and built environment would be maintained even as the culture became a subculture. It should be noted that little change in the traditional worldview in this time period was assumed, for it is robust over long periods of time in spite of extra-cultural influences (Thompson, 1945). However, it was assumed that an additional, competing worldview may have been introduced by the impacting culture. The dwelling unit in this study was termed modified traditional.

The procedure for data collection and analyses was the same as that for Study 1. Data was collected by the ACDF procedure (Appendix I, p. 266) then organized into tabular form as a normative building code. The resultant tables were compared with the criteria tables (Tables 1 and 2, pps. 54 - 55, 58 - 59). In this way, the degree of consistency between modified traditional dwelling unit and epistemology was determined for each culture.

Study 3

This study focused on conditions under which aspects of the built environment were imposed from one culture on another and consistency with the epistemology of the impacted culture was not expected.

The time period chosen was circa 1962 to 1976, when the United States Government developed an Indian housing policy. The dwelling unit was the focus of interest and in this case was termed imposed dwelling unit.

The procedure for data collection and analysis was essentially the same as that for Studies 1 and 2. Data was collected by the ACDF procedure (Appendix I, p. 266) then organized into tabular form as a normative building code. The resultant tables were compared with the criteria tables (Tables 1 and 2, pps. 54 - 55, 58 - 59). In this way, the degree of consistency between the imposed dwelling unit and epistemology was determined for each culture.

Additional sources used in this study were the most recent information available about the impacting culture's plans regarding house form (e.g. housing policies, housing surveys, photographs of housing) requested from appropriate government agencies (e.g. Bureau of Indian Affairs, Housing and Urban Development). Recent newspapers (1975 - 1976) expressing traditional cultural views were surveyed for relevant articles and photographs.

Study 4

The purpose of this study was to describe the built environment and examine evidence of the relationship between the built environment and traditional epistemology. In order to do this a field study of Zuni was undertaken. The study was limited to Zuni on the basis of ease of

access and ease of studying a compact, geographic totality. The Zuni still primarily inhabit the Zuni pueblo on Zuniland whereas the Navajo are more widespread (see Figure 4). Thus it was easier to study a representative sample of the built environment at Zuni.

The fieldwork occurred over a two week period as agreed upon with the Zuni Tribal Government. This period was considerably shorter than standard anthropological research would deem acceptable but, in view of the purpose of the study, which was mainly to survey the area, it was considered reasonable. Certainly length of stay was important and it is recognized that more and different kinds of data could have been gathered over a longer period.

In addition to the fact that empirical data could be gathered by the field method which, of course, added to the validity of this study, there were other benefits which were considerable. First, it enabled us to put the archival research into context, for no matter how much reading was done, the overall perspective of the environment and the culture was very much a matter of being there. Second, undertaking fieldwork sensitizes one to the limits of a researcher's abilities to gather information about another culture, particularly as this is related to ethics and values. This resulted in serious reviews -- before, during and after the field study -- of the appropriate role of the researcher and research in this context.

Historically, researchers have ferreted out information from other cultures, for the sake of knowing. In many cases, this involved a violation of individual and cultural privacy. In the past this has been rationalized as acceptable, based on the premise of superiority of the

culture of the researcher compared to the culture under study, or of the researcher (as scientist) compared to the researched (as subject) or the supposed "benefits" to those studied. In this context, it is deemed appropriate to investigate and then reveal what one has found without regard to its consequences. Especially in cross-cultural studies where the members of another culture may not really understand the implications of being researched, information may be revealed unsuspectingly. Presently, it is difficult to convince any native group or to be convinced oneself that it is in their best interests to reveal their secrets, for their have been numerous instances where information has been subsequently used to infiltrate and destroy cultural integrity. By virtue of this past history and related ethical considerations, it was decided that the traditional research stance was not appropriate because it was not ethical.

A straightforward approach was used. First, a letter of permission was sent to the official representative of the Zuni tribe, the Governor, indicating our affiliation, our interest in visiting Zuni in terms of what we intended to study, how we intended to study it and the period of time involved and the purposes for which the results would be used (Appendix I, p. 276). It was specified that a copy of the finished product would be sent for their own use, and that any limits regarding information or method that the members of the culture might stipulate would be accepted without question. It was also decided not to offer additional assistance, unless requested to do so, but (hopefully) to be approachable should the members of the culture want such help.

When permission for a two-week period was granted, arrangements were made to meet with the Zuni Tribal Historian on a daily basis, for ten days. He was aware of our research interests and on this basis proceeded to recount a variety of cultural and personal facts which he believed were necessary for context. Notes were taken during these conversations and after several such discussions, specific questions were asked (see Appendix I, p. 277).

A brief interview with the Governor of Zuni was arranged, to inquire about specific aspects of the built environment (see Appendix I, p. 277).

A survey of the historic area was made, using as a base the 1970 survey map. Notes were made on location and orientation of buildings, and materials of which they were made, personalization of exterior and building type. Any changes since 1970 were noted (see Appendix I, pps. 280 - 281).

Several field trips were made in Zuniland to assess the nature and location of built forms. Notes were made and photographs taken. These were compared to previous descriptions and sketches found in the sources of Studies 1, 2 and 3 to assess the degree and kind of change.

Once in the field, anyone with whom we came into contact was informed of our purposes, interests and affiliation. Information was gathered only from those who volunteered it, hence they were termed consultants not informants. In terms of these discussions, it was the individual rather than the researcher who defined the topics and interpreted them. Later, specific questions were asked but it was understood that one was not obligated to answer them.

In addition, written sources recommended by the Tribal Historian were consulted.

Based on the data from this study, the physical environment of Zuni was described and its future speculated upon.

Summary

These four studies covered a period of approximately 100 years in the history of the Navajo and Zuni cultures. Both content analysis of archives and field methods were used. In this way we were able to test whether or not there was evidence in the physical components of the built environment of two cultures which reflect and are reflected in differences in epistemological positions. This was tested under three conditions: (a) an archival period; (b) a period of Anglo-American contact; and (c) a period of Anglo-American contact and imposition. In the following chapters, the results of these studies are described.

CHAPTER 3

RESULTS OF STUDY 1

One of the initial hypotheses suggests that in different cultures there will be different evidence in the physical components of the built environment which reflect and are reflected in differences in epistemological positions. The Navajo and Zuni cultures were selected to test this possibility. This chapter will describe the results of archival research on these cultures from the period circa 1885 to circa 1925. Within that period, the task was to examine built forms of particular importance to the cultures in question and determine whether or not congruence existed between the epistemological premises and these forms. Three such forms were considered -- the traditional dwelling unit, the traditional ceremonial unit and the traditional settlement pattern -- both in terms of the salient features and the way in which these related to the culture's epistemological premises. The Navajo culture will be considered first, followed by the Zuni culture. After each culture has been described in this way, each built form -- traditional dwelling unit, traditional ceremonial unit and traditional settlement pattern -- will be compared across cultures.

It should be noted that the dates of the references cited in this chapter refer to the dates of publication. As such, they give the reader little conception of the time period to which they refer. For example, in some cases fieldwork was undertaken ten years before publication. In all cases, the references used refer to the traditional environmental component, i.e. that form of the component which was in evidence in the earlier archival period (1885 - 1925) and continued later. The discussion below does not refer to forms and/or features

that were the result of Anglo influence. These will be discussed in Chapters 4 and 5.

Since much of the data on which this section is based was derived from the HRAF, it should be noted that the use of the files as recommended by the HRAF was inadequate. For each category, slips of paper with passages relevant to the particular category are found but there is no context. It was necessary to read the entire article from which the passages were taken, in order to assess the context in which the material was presented. HRAF interpretation of what constituted an environmental category and a piece of environmental information differed from ours. This was rectified by reading each article in its entirety to find the "missing data" in addition to using the material found in the categories.

Data were organized in tabular form into a normative building code (see Table E, Appendix I, p. 263); and then compared to the appropriate criteria table (Tables 1 & 2, pps. 54 - 55, 58 - 59).

TRADITIONAL BUILT FORMS OF THE NAVAJO CULTURE

Three Navajo built forms will be the focus of this section:

- (a) the traditional dwelling unit known as the female hogan;
- (b) the traditional ceremonial unit known as the male hogan; and
- (c) the traditional settlement pattern.

For each of these, the salient features will be described and then related to the Navajo epistemological premises outlined in Chapter 2 (see also Table 1, pps. 54 - 55).

The Traditional Navajo Dwelling Unit: The Female Hogan

The traditional dwelling, or female hogan, was conceived of as a refuge -- a place in which humans could find protection, prosperity, peace and good luck (Newcomb, 1940; Rapoport, 1969; Yazzie, 1971). As a derivative of the first female hogan built for First Man and First Woman by the Holy People (Reichard, 1950; Yazzie, 1971), it characterized deity (Reichard, 1950). As the female centre of activity (Yazzie, 1971) it was used for such purposes as: storage, weaving, the preparation and consumption of food and sleeping. Housing a new biological family created by marriage was the primary reason for its construction according to mythological precedent (Newcomb, 1940; Reichard, 1950; Yazzie, 1971). But each family unit had more than one hogan, each located in a different catchment or surrounding area (miles apart) because of seasonal changes in the ability of catchments to provide for survival (Kluckhohn & Leighton, 1946).

There were three additional circumstances in which new hogans were built, primarily as replacements for former ones. First, a replacement hogan was constructed in the event of abandoning one because of lice infestation (Kluckhohn & Leighton, 1946) and was sited near the latter. Second, if someone died in a hogan (Haile, 1943; Kluckhohn & Leighton, 1943; Mindeleff, 1895; Newcomb, 1940), it was sealed and left to decay (Haile, 1932) or was burned (Haile, 1943; Kluckhohn & Leighton, 1946; Reichard, 1950) because the evil which invaded the corpse permeated the hogan with uncontrollable spirits, making it dangerous to its inhabitants. A replacement hogan was constructed on a new site. And third, a new hogan was built if the catchment (or surrounding area) in which a hogan

was situated became inadequate for survival -- for example, if a water source dried up (Kluckhohn & Leighton, 1946). Based on a knowledge of the unpredictable nature of some deities who direct and/or own various environment elements (Newcomb, 1940; Reichard, 1950), it was inferred that should such a shortage occur, it would be attributed to the fickle nature of the deity concerned or the violation of a taboo.

Thus each hogan was inhabited on a seasonal basis, depending upon the catchment in which it was located (Kluckhohn & Leighton, 1946; Mindeleff, 1895). This norm had survival value. Exceptions to this rule involved the abandonment of a hogan for reasons described earlier.

Before a hogan was built, its site was carefully selected by the male head of the family according to norms and taboos (Newcomb, 1940), several of which dealt with nonhuman property rights. First, the hogan was not to be sited on the rocky peak of a mountain or ridge (Newcomb, 1940). It was reasoned that these elements were owned by the Wind People, who would punish trespassers with twisting pains of the face and neck and children born on such a site would wander, never finding a permanent home (Newcomb, 1940). Moreover, considering the geography and climate, it seemed reasonable that such locations would be subject to high winds (Kluckhohn & Leighton, 1946). Thus the likelihood of the hogan and/or its inhabitants surviving there would be remote. The second rule was not to site a hogan near a deer trap, to avoid being threatened by the dead animals' spirits (Newcomb, 1940). It is inferred that this location was under the jurisdiction of the dead deer. Third, a hogan could not be sited on or near a riverbank, because the river was

owned by a possessive, antagonistic spirit (Newcomb, 1940). Considering the likelihood of flash floods during certain seasons (Kluckhohn & Leighton, 1946), such a location for a hogan could be dangerous for it and its inhabitants. Fourth, a hogan was not to be built on a place where lightning has struck, for it was owned by the Serpent of the Sky (Newcomb, 1940). Fifth, a hogan was not to be built in a box canyon or cave, for they were owned by the Echo People who would send bad dreams to the inhabitants (Newcomb, 1940). Sixth, a hogan was not to be built on ruins because the ancients buried their dead underneath floors or near town walls (Newcomb, 1940), and dead bodies were likely to be filled by evil, i.e. uncontrollable, spirits (Haile, 1943; Reichard, 1950). Finally, a hogan was not to be built near a source of wood or water already in use by another individual and, in this way, the depletion by overcrowding of resources necessary for survival was prevented (Kluckhohn & Leighton, 1946; Rapoport, 1969). Thus the rules for the siting of a hogan were based on respect for human and nonhuman property rights. In addition, the catchment of the chosen site was to provide the means for the family's survival; that is, grazing or farmland for a summer hogan, little snowfall and sufficient sources of wood and water for a winter hogan (Kluckhohn & Leighton, 1946).

After the location had been selected, major construction was undertaken by the male head of the biological unit and male relatives (Kluckhohn & Leighton, 1946; Mindeleff, 1895), and finishing touches (e.g. plastering of walls) were completed by related females during the day (Kluckhohn & Leighton, 1946; Mindeleff, 1895). The system of hogan delivery is shown in Figure 5 (p. 82). A hogan was never built at

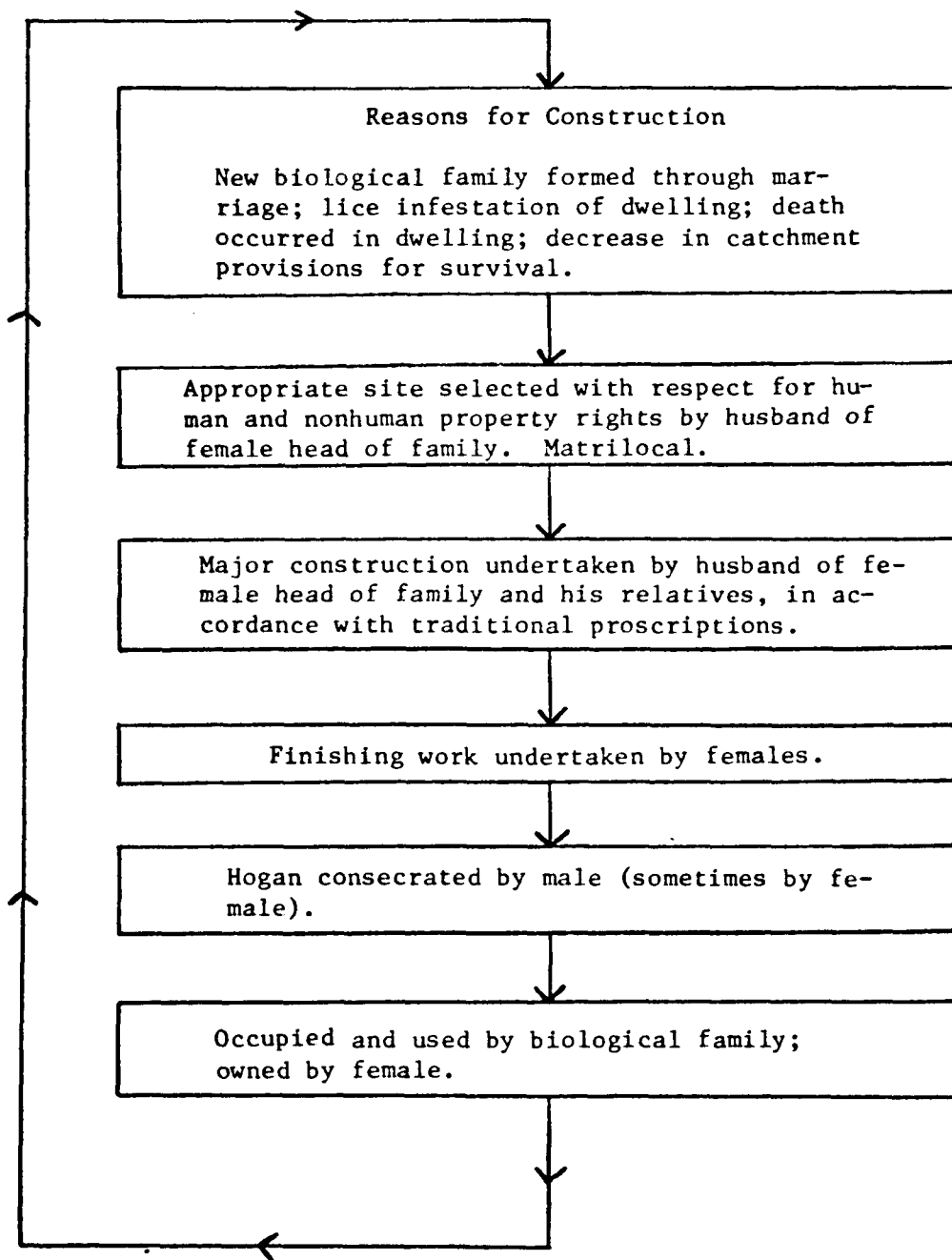


Figure 5: Traditional Hogan Delivery System of Navajo.

night, the time when witches and ghosts are about, for they might bring evil (Newcomb, 1940).

The completed form was owned by the female (Kluckhohn & Leighton, 1946; Simmons, 1949; Yazzie, 1971). In the context of this culture, it can be inferred that this enterprise represented a union of male and female -- in the sense that male dominance of construction was balanced by female ownership of the finished product. This is consistent with the equal but separate nature of sex roles in the Navajo culture (Kluckhohn & Leighton, 1946).

The materials of which the hogan was constructed included mud, wood, grass and rock, depending upon accessibility (Mindeleff, 1895; Rapoport, 1969).

The exterior as shown in Figure 6 (p. 84) was usually of a circular, hexagonal or octagonal form, although square hogans have been found (Corbett, 1940; Kluckhohn & Leighton, 1946; Landgraf, 1950; Mindeleff, 1895; Rapoport, 1969). In terms of the cultural symbolism (Reichard, 1950), the circular form exemplified the sacred sun, and the hexagonal form, the unity of the six directions. Kluckhohn and Leighton (1946) stated that the octagonal form was used when a larger interior space was desired.

Two stone slabs were planted facing east, on which two uprights of the doorway rested (Haile, 1942). The orientation of the doorway was specified by myth as east (Hill, 1938; Rapoport, 1969; Yazzie, 1971) the direction of least evil and most good, as the sacred sun rises there (Newcomb, 1940). Thus the hogan refuge had a good entrance into which one could escape from the hostile world. It was also a good position for the interior of the dwelling to receive light. The entrance was

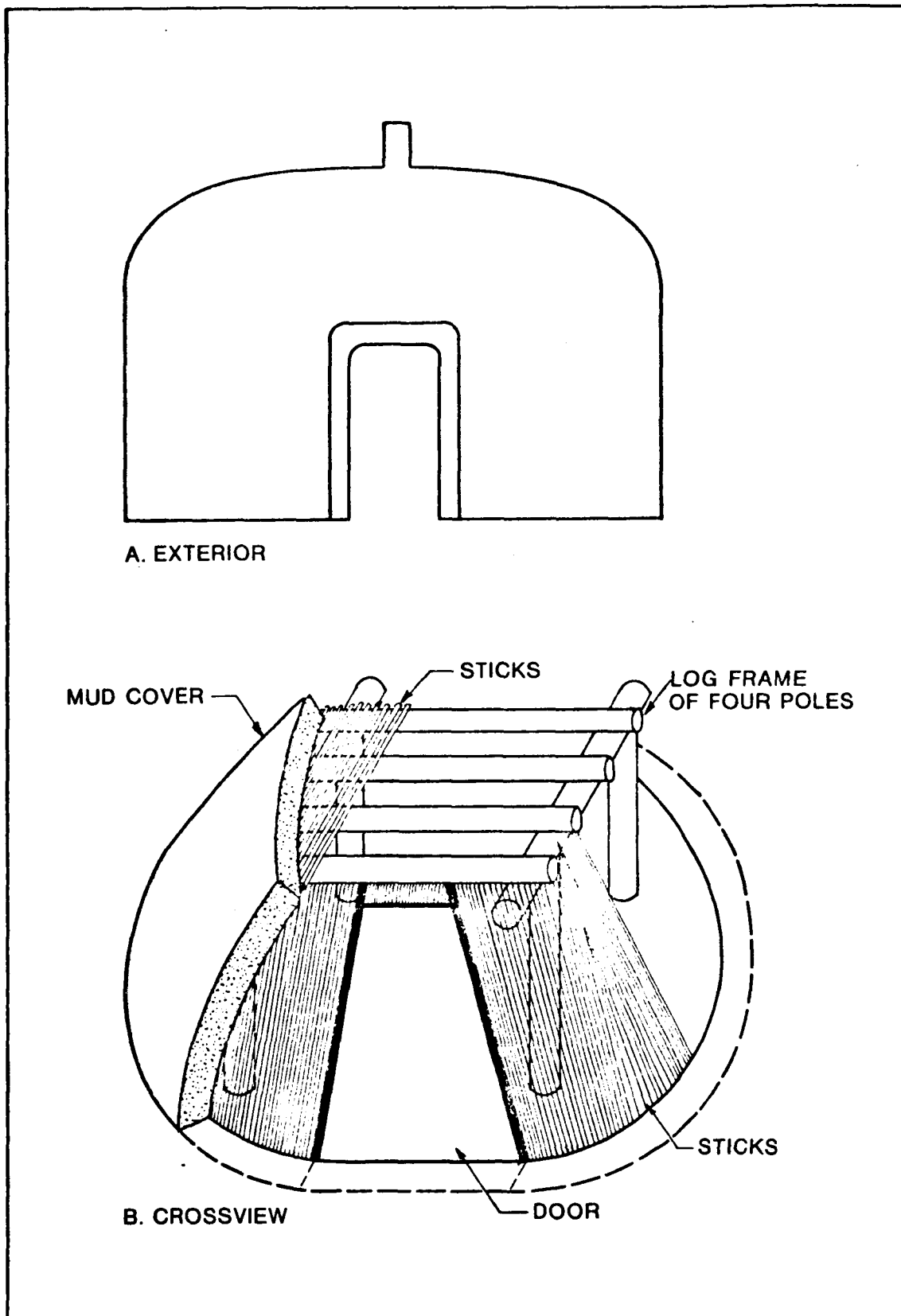


Figure 6 : Navajo Female Hogan (from Rapoport, 1969)

closed with a blanket hung on a pole (Kluckhohn & Leighton, 1946). Aside from the practical purpose of providing an exit, it interrupted the boundary of the hogan form, an important consideration because a completely bounded form was thought to confine evil (Newcomb, 1940), presenting a danger to its inhabitants. Thus this opening could be conceived of as a mechanism for dissipating evil. No openings were made in the north side, the most evil direction (Newcomb, 1940; Reichard, 1950) except to remove a dead body. Again this is an example of the permeable nature of the house form to uncontrollable spirits, posing a threat to its inhabitants.

There was an opening in the centre of the hogan above the fire which provided light and ventilation (Kluckhohn & Leighton, 1946; Newcomb, 1940). Through it the fire, representative of the sun, was linked to the sun itself (Newcomb, 1940). In general then, the hogan had few openings. One in the east released evil, but it seems that more might make the structure and thus its inhabitants, vulnerable to invasion by evil spirits.

The interior consisted of one room, about 25 feet in diameter, in which a definite order of placement of objects was followed, as prescribed by myth (Kluckhohn & Leighton, 1946; Rapoport, 1969). Internal order is shown in Figure 7 (p. 86). There were four or five hoganposts, fundamental to this structure; four were placed in the cardinal directions in a specific order -- east, south, west, north (Mindeleff, 1895; Rapoport, 1969; Reichard, 1950; Yazzie, 1971), a sequence which exemplified good, i.e. controllable, order (Reichard, 1950). The directions together may be considered to exemplify the unity of space (Reichard, 1950). Each post represented a female deity (Mindeleff, 1895; Reichard, 1950; Yazzie,

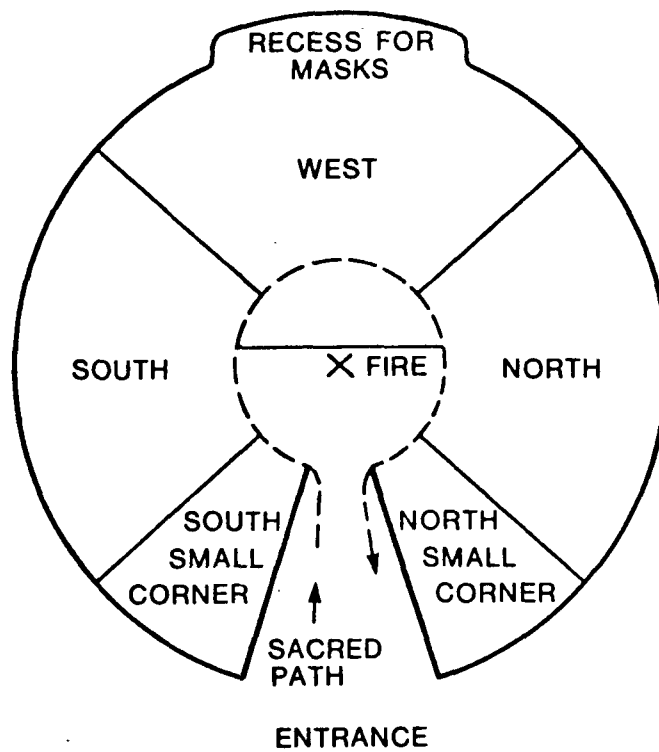


Figure 7 : Interior of Navajo Hogan (from Mindeleff, 1895)

1971), so that this cardinal unity of four female deities symbolized unity with femaleness, thereby reinforcing the link with the female owner of the form (Simmons, 1949), the matrilocal community and Changing Woman (Mother Earth). In this way, it was a truly female hogan. If a fifth hoganpost was used, it was placed in the northeast (Stephen, 1890), a direction that could be taken as indicating the mixture of good and evil. Since it formed the vestibule with the east or good post, the northeast-east link may have represented the neutralization of evil or perhaps, the transformation through passage from the hostile world to the safety of the dwelling.

In the centre of all the posts on the floor was the fire whose light and warmth was likened to that of the sacred sun whose rays bring the same benefits in all directions equally (Newcomb, 1940). In terms of the usual shape of the hogan, it seemed to be the best location for the equal distribution of light and warmth. On a symbolic level, its central location within the circular form of the hogan (again symbolic of the sun) exemplified the unity of this totality (see also Rapoport, 1969). Moreover, it can be inferred that the surrounding of the male symbol, fire, by the female hoganposts, implied that the purpose of the setting is the creation of a family (Reichard, 1950).

It seemed that the hogan was permeable to both beneficent and malevolent forces. Thus in general what was important was the incorporation of as many "good" elements as possible, good being culturally defined as those which bring good (e.g. the eastern orientation) and thereby protect one against evil; and the avoidance of "bad" elements, i.e. those which may subject the form and thus its inhabitants to uncontrollable forces (e.g. a northern opening).

When the hogan was finished, it was consecrated according to mythological precedent, by the male head of the household (or the female, if necessary) with songs from the Blessing Way Rite (Mindeleff, 1895; Newcomb, 1940; Reichard, 1950). This made it ready for occupation.

Users of the hogan followed certain rules of behaviour. First, they never stood in the open door with their hands on the casings closing the entrance because doing so brought bad luck to anyone inside at the time (Newcomb, 1940). This is another example of the notion that a completely bounded form confines evil (Newcomb, 1940). Second, they never knocked at the door. It was bad luck for anyone to come to the entrance and find no one there (Newcomb, 1940), for only evil winds knock and opening the entrance would lead to invasion. Third, they walked sunwise (as shown in Figure 7, p. 86) around the fire (Mindeleff, 1895; Rapoport, 1969) because that is the good path. Fourth, they sat inside in an order specified by myth, as follows: females and children sat on the south side, males on the north and distinguished visitors on the west (Reichard, 1950). Based on cultural symbolism (Reichard, 1950), it is inferred that the best direction for women is farthest from that of evil, because of the possibility of barrenness (Newcomb, 1940). Children being vulnerable also required similar protection and thus sat on the south. West, away from the door was the most valuable or protected place and allowed one to face toward the best direction, hence its use for dignitaries. Since it would seem unfavourable to block the entrance by sitting on the east side (a taboo mentioned previously), the only direction for males to sit was on the north side.

In this report, the various norms and taboos associated with the female hogan have been considered as a normative building code. This

code, which has already been elaborated, is summarized in Table 3, (pps. 90 - 93).

The Female Hogan and Navajo Epistemology

As stated in Chapter 2, the premises of Navajo worldview concerned order, control and oneness interpreted from an anthropocentric focus. The key points of Navajo epistemology elaborated in Chapter 2 (see also Table 1, pps. 54 - 55) are briefly summarized.

The world was conceptualized as a mixture of human and nonhuman elements whose ultimate goal of universal oneness was yet to be achieved; at present they are in need of order. Order was conceived of in terms of the maintenance of stability through the division of the universe into groups of elements in which internal sequence is emphasized (Haile, 1932), and through advances in human knowledge (Reichard, 1950). Knowledge was thereby a source of power and control whose importance was stressed, because of the permeable nature of the human being to controllable and uncontrollable forces. Every element had its place in the scheme. Each was similar in terms of its past or future relationship to the human, and was presently thought of in terms of human utility; hence an anthropocentric focus. In spite of an acknowledged closeness between the human and certain nonhuman elements (e.g. game animals, deities), deities were considered to be more powerful than humans.

The central concern here is the relationship between these aspects of Navajo epistemology and the features of the dwelling unit. The degree to which each premise is exemplified in the female hogan will be considered.

Order. Since the Navajo premise of order inferred stability, a built environment consistent with this premise would exemplify this

Table 3

Normative Building Code:

Navajo Female Hogan

Features	Organization	Function	Conceptualization
Location	Not on or near rocky peak of mountain or ridge; deer trap; river bank; place where lightning struck; box canyon or cave; ruins (Newcomb, 1940).	Human safety (inferred from Newcomb, 1940).	Respect for nonhuman property rights and fear of retaliation (Haile, 1943; Newcomb, 1940).
	Not near source of wood or water already in use (Newcomb, 1940).	Group survival (inferred).	
	Near seasonally appropriate catchment (Kluckhohn & Leighton, 1946).	Survival (inferred).	
Exterior	Constructed of variety of materials (Kluckhohn & Leighton, 1946).		Availability (Kluckhohn & Leighton, 1946).
	Usually circular form (Mindeleff, 1895; Newcomb, 1940; Kluckhohn & Leighton, 1946).	Spacious (Haile, 1942).	Like sacred sun (Rapoport, 1969).
	Opening in centre above fire (Newcomb, 1940).	Light and ventilation (inferred).	Links fire (symbol of sun) with sun (inferred from cultural symbolism).

	One opening on east side (Newcomb, 1940).	Best position for light; protection (Newcomb, 1940).	Completely bounded form confines evil; direction of least evil and most good as sacred sun rises from there (Newcomb, 1940).
	Few windows, none on north side (Newcomb, 1940).	Protection (inferred).	North most evil direction (Newcomb, 1940).
	General: must incorporate as many good elements as possible. (inferred from stress on use of good elements and avoidance of bad).	Safety (inferred from concern with protection from invasion by use of good elements).	Good elements bring good protect against evil (Newcomb, 1940).
Number built	Each family unit may have more than one, as long as each is in different catchment (Kluckhohn & Leighton, 1946).	Survival (inferred).	
Interior	One room; space divided direc- tionally (Mindeleff, 1895).	Order (inferred).	In terms of directions (Mindeleff, 1895).
	Four or five hoganposts placed in specific order in specific directions (Mindeleff, 1895).	Structurally fundamen- tal (inferred).	Symbolic of female (Mindeleff, 1895) implies reproductive setting.
	Definite placement of objects and persons (Mindeleff, 1895).		
	Fire in centre of floor (Newcomb, 1940).	Equal distribution of warmth and light (inferred).	Likened to sacred sun and influence of its rays (Newcomb, 1940).

Builders	Majority of construction undertaken by male head of biological unit and relatives (Kluckhohn & Leighton, 1946).		Male dominates construction; counterbalanced by female ownership of finished product (inferred from cultural symbolism).
Reasons for construction	Formation of new family through marriage (Newcomb, 1940).	Dwelling.	Mythological precedent (Newcomb, 1940).
	Lice infestation of hogan (Kluckhohn & Leighton, 1946; Newcomb, 1940).	Bothersome (inferred).	
	Occurrence of death in hogan (Haile, 1932; Kluckhohn & Leighton, 1946; Newcomb, 1940).	Safety (inferred).	Dead body can be invaded by evil spirits and permeate hogan (Haile, 1932).
	Decrease of ability of catchment to provide for survival (Kluckhohn & Leighton, 1946).	Survival (Kluckhohn & Leighton, 1946).	Shortage probably attributed to violation of taboo or fickle nature of deity concerned (inferred).
Time of construction	Never built at night (Newcomb, 1940).	Safety (inferred).	At night ghosts and witches are about and may bring evil (Newcomb, 1940).
Consecration	By male head of family (Mindeleff, 1895; Newcomb, 1940).		Mythological precedent Mindeleff, 1895).
Ownership	By female head of family (Kluckhohn & Leighton, 1946).		Matrilocal. Female centre of activity (Yazzie, 1971).

Inhabitants	Biological family; humans only (Newcomb, 1940).	Mythological precedent (Newcomb, 1940).
Length of inhabitation	Seasonally permanent; for exceptions see reasons for construction (Kluckhohn & Leighton, 1946).	Survival (inferred).
Function		Dwelling. Multiple use (Kluckhohn & Leighton, 1946). Refuge (Newcomb, 1940).
Etiquette	Never stand in any open door with hand on casings closing entrance (Newcomb, 1940).	Safety (inferred) Closes entrance and brings bad luck to those inside at the time (Newcomb, 1940).
	Never knock (Newcomb, 1940).	Safety (inferred). Evil winds knock and invade (Newcomb, 1940).
	Placement of persons -- females and children on south; males on north; distinguished visitors on west (Newcomb, 1940).	Mythological precedent (inferred).

characteristic, a sense of place, especially through the orderly sequence of groups. In terms of conceptualization, the female hogan was a retreat from chaos, which infers that it is orderly, i.e. stable. Further consistency of the female hogan with this premise was shown in the organization of its features, for example the specifications regarding: time of construction, orientation, location (where it could not be sited), placement of openings, arrangement of interior objects, and the location of the fire. Note also the orderly grouping of objects and hoganposts. The careful attention to internal arrangement of objects and persons and orientation seemed to be for the purpose of giving one a sense of place (Reichard, 1950). However, the variations both in materials used and in external form were not consistent with this premise. The use of building materials was highly dependent on their accessibility, since Navajoland was large in area and varied in material resources. Part of the variation in form could be attributed to increasing space needs (Kluckhohn & Leighton, 1946) for the octagonal hogan accommodated a much larger interior area than the round one. In summary, many hogan features were consistent with the Navajo premise of order.

Control. Consistency with the cultural idea of control would mean that controllable features would be emphasized and the uncontrollable avoided. This was shown in the hogan's conceptualization, organization and function. The norm of abandoning the hogan in the event of death maintained control on a symbolic level by avoiding invasion from a corpse possibly infested with evil (Haile, 1932). The norms regarding respect for nonhuman property rights in site selection similarly maintained control by avoiding the retaliation of deities, and the organization of physical features by using good, i.e. controllable, elements (e.g.

eastern orientation, the broken boundary) and avoiding bad, manifested control, in that they prevented the invasion of uncontrollable spirits. Note also the avoidance of the uncontrollable in the taboo against nocturnal construction of the hogan and behavioural norms regarding prevention of invasion. The speculation about the placement of persons in terms of avoiding evil, was a further example of consistency with this premise. Thus, this premise was exemplified in several hogan features.

Oneness. Small scale unity was shown in a variety of ways. The predominant use of the circular form, consisting solely of one room was symbolic of unity though openings do, by necessity, pierce the form, making it less than perfect. As previously stated, unification of hoganposts, posts and fire, and fire and sun were other symbolic examples of this premise. Union was also reflected in the balance between male labour and female ownership of the structure, and the housing of the biologically reproductive unit and their children -- the results of that union. Thus features of the female hogan were consistent with the Navajo premise of oneness.

Anthropocentric focus. Anthropocentrism was predicted in the Navajo environment, in terms of the human utility of the built environment. This was confirmed. The hogan was built by and for humans to protect them against uncontrollable forces. Indeed animals were not allowed to enter. The selection of the catchment was in terms of human utility, i.e. it had to provide the means for human survival and its location was influenced by a respect for human property rights and an avoidance of locales under nonhuman jurisdiction for human safety. However, symbolic links with the nonhuman (e.g. orientation linking

hogan to sun) may be interpreted as inconsistent with this premise (though consistent with other premises such as oneness).

Nonhuman power. To the Navajo, nonhuman power would manifest itself in three ways: avoidance of the nonhuman, alliance with the nonhuman and ambivalence toward the nonhuman. Avoidance was shown in the female hogan, in terms of its conceptualization as a retreat from uncontrollable forces, and as previously stated, in the site taboos, reasons for abandonment and taboo against night time construction. Alliance was demonstrated in its conception as a good environment which symbolically allied itself with the sacred sun. Ambivalence was symbolically reflected in the use of the broken circular boundary for permeability of the form made it vulnerable to both goodness and badness of nonhuman power. It is this permeability which pierces the otherwise perfect unity of the circular form. A closed boundary would contain evil, thereby requiring an opening to release it; yet the same opening could expose the inhabitants to evil, for example if one opens the entrance and no one is there. Thus there are aspects of the hogan which are consistent with the premise of nonhuman power.

Intimacy with deity. Sacredness of an environmental structure reflected the intimacy between god and human, for the female hogan was given to humans by the gods as a structure in which to live. Thus it is not surprising that many of its features had a basis in mythological precedent and are symbolic of deity (e.g. form, orientation). Symbolically there was the possible link between the holy and secular forms (especially through consecration), and the holy and the secular family. Moreover the deification of the female was inferred from the female symbolism in the structure (e.g. the hoganposts). Therefore, consis-

tency between female hogan and the premise of intimacy with deity was demonstrated.

Close relationship with animals. This premise was not exemplified at all. Perhaps the lack of relationship can be attributed to the rarity of the game animals upon which myth and ritual placed so much importance. Reichard (1950) has suggested that:

The Navaho treatment of animals is a paradox. Although for years the tribe has depended upon domesticated animals for subsistence, the religion still emphasizes the rare game animals, which are almost as scarce in the Navaho environment as in ours. The belief that wild animals are helpers of human beings has not been laid aside now that game has been supplanted by the more easily obtainable sheep, goat, or steer.... Yet for the domesticated animals upon which he depends for food he has little religious respect; to him they are property rather than sentient beings (p. 142).

This paradox helps to explain why the premise regarding animals of myth was not exemplified. Game animals were too rare to be used or housed near or with humans and domestic animals were of no consequence -- except in terms of keeping them out of the hogan because of its sacred nature. For example, should a snake wander into the hogan one was to get a stick and twist the snake around it with gentle entreaties. Then it was removed to a field and released with prayer and explanation, in the hope that it would not retaliate (Newcomb, 1940).

Summary. All of the premises were consistent with the female hogan's features. However, in some cases, there was inconsistency as well, which will be discussed in Chapter 7. The interrelated nature of the premises also was reflected. For example, the eastern orientation agreed with the premise of order (in that orientation was specific),

control (in terms of the use of a good element), oneness (in terms of its symbolic link with the sun), deification (in terms of the symbolic link with the deity), and nonhuman power (as in deification and control). In conclusion, the Navajo dwelling form of the late nineteenth century was closely related to the premises of the Navajo worldview. The female hogan was a building which expressed, in a variety of ways, the stability, small-scale unity, control and anthropocentric focus of this culture.

Whether this kind of relationship holds for Navajo ceremonial unit is the subject of the following section.

The Traditional Navajo Ceremonial Unit: The Male Hogan

Historically and mythologically, the traditional dwelling and ceremonial units were closely related for the female hogan was considered a derivative of the male form (Yazzie, 1971). They shared many features; in this description, features common to both will be mentioned briefly, as they have been elaborated in the previous section.

The male hogan was constructed solely for religious purposes (Mindeleff, 1895; Yazzie, 1971), based on mythological precedent (Yazzie, 1971).

At the turn of the century, any traditional Navajo structure known as a hogan, meeting the structural requirements and consecration procedures could be used for religious purposes. However, there were instances in which hogans were built primarily or solely for religious purposes, and it should be noted that in recent years, the distinction between hogans for religious purposes (male hogans) and other such structures has become increasingly articulated (Yazzie, 1971). Some researchers considered a new hogan to be required for every major ceremony (Tozzer,

1909). Based on cultural worldview it is inferred that new strength in the form of a new hogan was required, because every major ceremony "saps" the structure of its strength. However, others (Mindeleff, 1895) gave evidence that several ceremonies were held in the same hogan.

The primary purpose of the ceremony was healing of an individual. Should someone build a dwelling -- a female hogan -- and soon after become ill, the sickness was attributed to malevolent forces which inhabited it. That structure could not be used as the environment in which to heal the person, for the evil forces were too strong there. Individual control and thus health could be restored through the use of a good, strong, i.e. holy, environment, in which evil can be controlled. Thus a Yeibichai hogan, i.e. a hogan for the Yeibichai ceremony, was built (Mindeleff, 1895). Any such hogans used primarily or solely for religious purposes are termed male hogans in this study.

Before a male hogan could be built, an appropriate site was selected in accordance with respect for nonhuman property rights. These have been described in terms of the female hogan. In summary, a hogan could not be built on the rocky peak of a mountain or ridge, near a deer trap, on or near a riverbank, on a place where lightning has struck, in a box canyon or cave, or on ruins.

After the location had been chosen, the major construction was undertaken by males related to the individual requiring the structure for the ceremony (Kluckhohn & Leighton, 1946), and any finishing touches were completed by related females (Kluckhohn & Leighton, 1946; Mindeleff, 1895) during the day. A hogan was never built at night, the time when witches and ghosts are about, for they might bring evil (Newcomb, 1940).

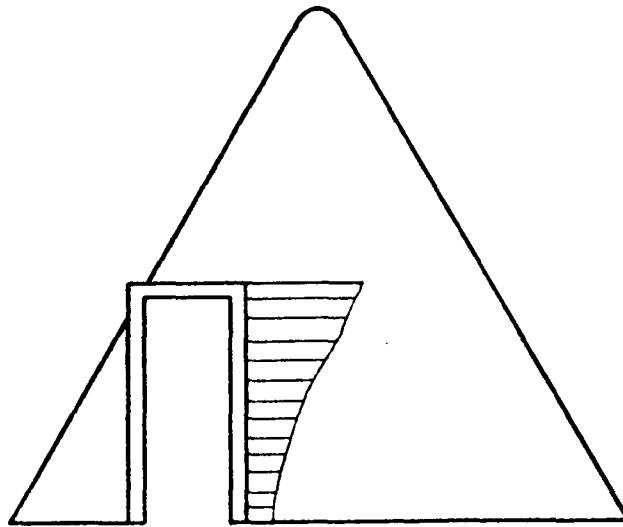
The exterior (shown in Figure 8, p. 101) was circular and was composed of available materials, usually wood and mud (Rapoport, 1969; Yazzie, 1971). The form is symbolic of the sacred sun (Reichard, 1950).

There were two openings, one in the centre of the roof and one in the east side forming a vestibule covered by a blanket which served as the exit (Mindeleff, 1895; Page, 1937; Rapoport, 1969). The eastern orientation symbolized the direction of least evil and most good, as the sacred sun rises from there (Newcomb, 1940).

The interior (Figure 7, p. 86) was a single room, in which a definite order of placement of objects was followed, as prescribed by myth (Reichard, 1950). There was a pit-like floor which might, at times, have a fire in the centre (Stephen, 1890). The fire symbolism has been elaborated in the discussion of the female hogan; the hoganposts also have been previously described. Over time, it seemed to be more usual for the ceremonial hogan to have five, rather than four hoganposts (Yazzie, 1971). Feathers of different birds, termed the eyes of the hogan, were placed at the tops of the four cardinal posts (Yazzie, 1971).

When the structure was completed, it was consecrated according to mythological precedent with pollen underneath (representing the sun) and on top and on the posts representing the cardinal directions (Newcomb, 1940; Reichard, 1950). Symbolically, this may represent the unity of the temporal-spatial totality because the blessing is in six directions. However, Haile (1942) indicated that the use of a hogan for a ceremony constituted its sanctification.

A. EXTERIOR



B. CROSSVIEW

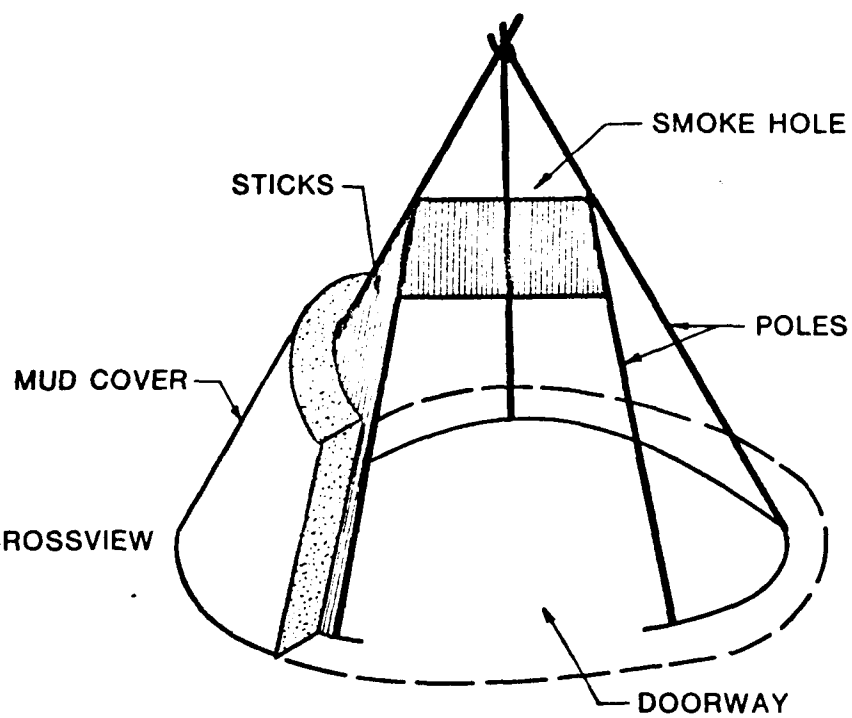


Figure 8 : Navajo Male Hogan (from Rapoport, 1969)

Participants in the ceremony were allowed into this structure (Kluckhohn & Leighton, 1946) and rules of etiquette were similar to those regarding the female hogan, elaborated previously. However, the major persons (the Singer and the individual to be healed) occupied the entire west and southwest portions of the interior (Mindeleff, 1895). In addition, the remains of food or fire consumed in the male hogan must be removed immediately (Yazzie, 1971). It is inferred that since the purpose of this structure is exclusively religious, nothing else (such as the functions of eating) must interfere with it.

Thus in terms of physical appearance, the male hogan had much in common with the female hogan. The building customs of the male hogan which have been elaborated are termed, in this report, a normative building code and are summarized in Table 4 (pps. 103 - 105).

The Male Hogan and Navajo Epistemology

In brief, the premises of concern deal with order, control, oneness, anthropocentrism and deity interpreted from the Navajo perspective. Each will be examined in terms of its relationship to the male hogan.

Because of the physical similarities in the male and female hogan, it is not surprising that their relationship to Navajo epistemology should have some commonality.

Order. Order was exemplified in a manner similar to the female hogan, in terms of the specification of physical and social features such as the orientation, form, openings, number of hoganposts, builders, consecration procedure, period of use and the stress on orderly sequence of arrangement such as the placement of hoganposts, objects and persons in the interior. Thus the male hogan is an orderly, symbolically stable structure.

Table 4

Normative Building Code:

Navajo Male Hogan

Features	Organization	Function	Conceptualization
Location	Not on or near rocky peak of mountain or ridge; deer trap; river bank; place where lightning struck; box canyon or cave; ruins (Newcomb, 1940).	Human safety (inferred from Newcomb, 1940).	Respect for nonhuman property rights and fear of retaliation (Haile, 1943; Newcomb, 1940).
Exterior	Constructed of variety of materials (Kluckhohn & Leighton, 1946).		Availability (Kluckhohn & Leighton, 1946).
	Circular form (Mindeleff, Newcomb, 1940; Kluckhohn & Leighton, 1946).	Spacious (Haile, 1942).	Like sacred sun (Rapoport, 1969).
	Opening in centre above fire (Newcomb, 1940).	Light and ventilation (inferred).	Links fire (symbol of sun) with sun (Newcomb, 1940).
	One opening on east side (Newcomb, 1940).	Best position for light; protection (Newcomb, 1940).	Completely bounded form confines evil; direction of least evil and most good as sacred sun rises from there (Newcomb, 1940).

	General: must incorporate as many good elements as possible (inferred).	Safety (inferred).	Good elements bring good and protect from evil (Newcomb, 1940).
Interior	Pit-like floor with fire in centre (if at all) (Mindeleff, 1895; Yazzie, 1971). Definite order of placement of persons and things (Mindeleff, 1895; Newcomb, 1940). Usually five posts placed in specific order and specific directions (Mindeleff, 1895).	Fire for heat and light (inferred).	Fire symbolic of sun (Newcomb, 1940).
Builders	Majority of construction undertaken by males related to person requiring ceremony and thus ceremonial structure (Mindeleff, 1895).	Structurally fundamental (inferred).	Mythological precedent (Yazzie, 1971).
Reasons for construction	Religious; for healing of person (Mindeleff, 1895).		Consistent with male dominance of religious activities (Yazzie, 1971). Mythological precedent (Yazzie, 1971). An individual so out of control as to be ill, requires a good environment to be restored (inferred).
Time of construction	Never built at night (Newcomb, 1940).	Safety (inferred).	At night, ghosts and witches about may bring evil (Newcomb, 1940).
Users	Those participating in the ceremony (Kluckhohn & Leighton, 1946).	For healing of person (Mindeleff, 1895).	

Consecration	By use for ceremony (Mindeleff, 1895).		
Length of use	During ceremony (Kluckhohn & Leighton, 1946).		
Etiquette	Never stand in open door with hand on casings closing entrance (Newcomb, 1940).	Safety (inferred from concern with protection against evil element).	Closes entrance and brings bad luck to those inside at the time (Newcomb, 1940).
	Never knock (Newcomb, 1940).	Safety (inferred from concern with protection against evil winds).	Evil winds knock and invade (Newcomb, 1940).
	Singer and ill person occupy south and southwest portions (Mindeleff, 1895).		Tradition.
	Remains of food and fire must be removed immediately (Yazzie, 1971).		Interferes with religious function (inferred).

Control. The premise of control was shown in the function of the male hogan, the restoration of individual control and the symbolism of the hoganposts, from which it can be inferred that the placement of northeast and east posts in the vestibule neutralized the uncontrollable. Moreover, control was manifest in a manner similar to the female hogan in terms of the time of construction, taboos regarding location, eastern orientation, norms for openings, placement of objects and persons and the use of good elements.

Oneness. The purpose of the male hogan, restoring union to bodily elements exemplified the small scale unity that is part of Navajo epistemology. Unification symbolism (e.g. between fire and sun, fire and posts) was apparent in some physical features.

Anthropocentric focus. The structure was built by and for humans, only, and was essentially a therapeutic environment for humans. This is not to imply that the nonhuman element was not incorporated into the structure; it had a role in assisting the healing process.

Nonhuman power. The superiority of nonhuman power was amply demonstrated in two ways. First, the superiority of the uncontrollable deities was recognized by the need to construct a built form to establish a new power balance. So powerful were these forces that changing the power balance was only attempted on an individual level, and a new structure was required every time (Tozzer, 1909). Note also the structural attempts at alliance with beneficent deities (e.g. the sun via orientation, shape of form) in order to combat the uncontrollable. Other attempts at alliance were shown in the ceremony during which the Singer unfolded the prayer bundle and made a sandpainting, thereby

inviting deities who when properly approached would be hard pressed to refuse. However, it should be noted that the purpose of this form was not for the deification of the nonhuman but rather an attempt to request and ally nonhuman cooperation for an individual human illness. Thus this building demonstrates the need of the human for the nonhuman power (and in this way the superiority of the nonhumans) but the primary purpose of this demonstration is a human end.

Intimacy with deity. Near-deification of the human was shown in the deification of the built form used by human, for it was holy, based on mythological prototype built by the gods. However, in fulfilling its purpose as a therapeutic environment, the structure housed the process of separation of the individual from the uncontrollable forces that caused the sickness by allying the individual with beneficent forces. In this way, the individual both separates from and becomes closer to the deities.

Close relationship with animals. This was shown in this structure in the use of feathers on top of the hoganposts. The function of these feathers was not able to be determined. Moreover, considering the paradoxical treatment of animals mentioned previously, perhaps the ritual emphasis of animals in the animal elements of the prayer bundle used inside the hogan or the sandpainting (which included animal elements) constructed during a Sing is all that can be used to exemplify their closeness with humans.

Summary. All premises were consistent with the features of the male hogan. Again the interrelated nature of the premises was reflected in the fact that aspects of a single feature could be viewed as consistent with several of them.

The Traditional Navajo Settlement Pattern: The Cluster Pattern

Each married couple should live in its own hogan because the Camp Fire of the Heavens (North Star) placed cold North Man (Big Dipper) on one side and his wife (Cassipoca) on the other but no other couple near them (Newcomb, 1940).

There was no fixed totality termed Navajo settlement (Kluckhohn & Leighton, 1946; Landgraf, 1950). Instead it was a series of seasonally permanent clusters, as shown in Figure 9 (p. 109) each consisting of a female hogan and associated support structures -- sweathogans, corrals and storehogans (Kluckhohn & Leighton, 1946). One building unit of note was the sweathogan which is similar to other hogans except that it has no opening in the roof. It was used for ritual cleansing through sweat and usually one or two of these were located some distance from the female hogan. Clusters of the extended, matrilineal family were usually within shouting distance of one another, consistent with a matrilocal culture for the inferred purpose of assistance. Clusters of the outfit -- a loosely related, fluid kin group -- were spread out and not necessarily contiguous (Kluckhohn & Leighton, 1946). Again this arrangement can be inferred as one based on assistance but loosely organized out of respect for human property rights. Perhaps we can speculate that the loose organization of clusters is to dissipate evil, i.e. to prevent it from festering in enclosed areas which would be consistent with Navajo views on the subject (Haile, 1932).

Other aspects relevant to settlement pattern are the almost totally uniform eastern orientation of all buildings and the adherence to the

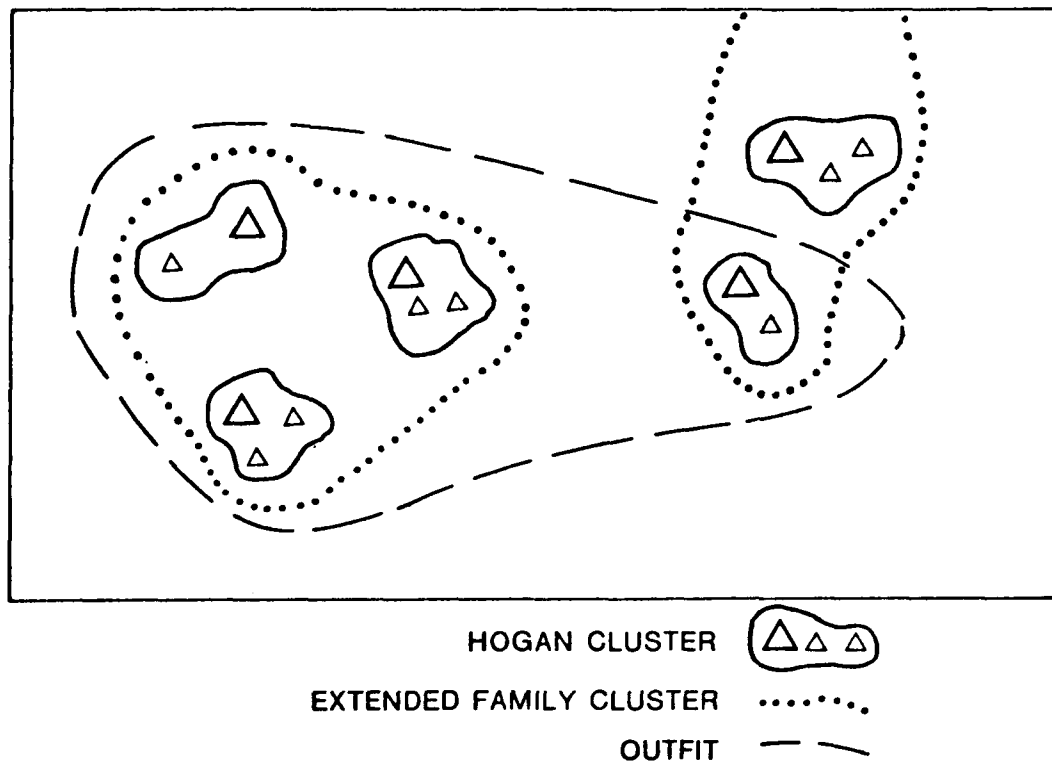


Figure 9 : Navajo Settlement Pattern

site selection criteria, previously described in the sections on the male and female hogan. These have been included in the summary of building customs, termed normative building code, in Table 5 (pps. 111 - 112).

The Settlement Pattern and Navajo Epistemology

As previously stated, the Navajo settlement pattern was highly dependent on female hogans for its organizational characteristics. The relationship between this pattern and Navajo epistemological premises is described herein.

Order. The stability of Navajo order was exemplified in several ways. The uniformity of the orientation of all structures and the organization of the settlement into clusters was consistent with the premise of order. The seasonal nature and fluidity of the outfit cluster pattern contradicted this premise, but the seasonal nature of inhabitation was highly dependent on geography and climate, thereby beyond human control.

Control. Control was exemplified as in the female hogan, in terms of reasons for and times of construction, site restrictions and orientation. Moreover, the physical fluidity of the outfit clusters was speculated to be based on control.

Oneness. The settlement pattern was the result of female and male hogans and related support structures, which may be indicative of harmony, and certainly indicated a predominance of a single structural form. Note that the organizational unity of the cluster, in terms of physical proximity, varied inversely with increasing scale, consistent with the notion of small scale oneness.

Table 5
Normative Building Code:
Navajo Settlement Pattern

Features	Organization	Function	Conceptualization
Form	Scattered. Basic unit is the seasonally permanent cluster consisting of a female hogan and associated support structures (Kluckhohn & Leighton, 1946).		
	Clusters of extended family within shouting distance (Kluckhohn & Leighton, 1946).	Assistance (inferred).	
	Cluster of outfit spread out and not necessarily contiguous (Kluckhohn & Leighton, 1946).	Assistance (inferred).	
	Doorways of all buildings face east (Newcomb, 1940).		Direction of most good and least evil and sacred sun rises from there (Newcomb, 1940).
Component structures	Female hogans.	Dwellings, multiple uses (Kluckhohn & Leighton, 1946).	Mythological precedent (Yazzied, 1971).
	Male hogans.	Religious (Yazzie, 1971).	Mythological precedent (Yazzie, 1971).

	Support structures: sweathogans, corrals, storehogans (Kluckhohn & Leighton, 1946).	Necessity (inferred). Sweathogans: religious (Mindeleff, 1895).	
Location	Not on or near rocky peak of mountain or ridge; deer trap; river bank; place where lightning struck; box canyon or cave; ruins (Newcomb, 1940).	Safety (inferred).	Respect for nonhuman property right and fear of retaliation (Haile, 1943; Newcomb, 1940).
	Female hogans, not near source of wood or water already in use (Newcomb, 1940).	Group survival (inferred).	
	Female hogans: near seasonally appropriate catchment (Kluckhohn & Leighton, 1946).	Safety (inferred).	
Builders	Males undertake major construction; females do related tasks (Kluckhohn & Leighton, 1946).		
Time of Construction	Never build at night (Newcomb, 1940).	Safety (inferred).	At night, witches and ghosts about may bring evil (Newcomb, 1940).
Consecration	Dwelling by male; religious structure by ceremony (Mindeleff, 1895).		Tradition (Mindeleff, 1895).

Anthropocentric focus. The clusteral organization was based on human kin groups, consistent with anthropocentrism. Another aspect was the selection of the catchment in terms of human utility.

Nonhuman power. The premise of nonhuman power was manifest primarily in the alliance of structures with the sun through uniform eastward orientation, and the dissipation of uncontrollable forces through the looseness of the clusteral organization. Other relevant examples were adherence to site taboos based on fear of nonhuman power and the taboo against night time construction.

Intimacy with deity. Human-deity intimacy was shown in settlement pattern, the symbolic union of eastward orientation of all buildings with the sun, related to deification. Moreover, the female, male and sweathogans had religious connotations of varying degrees. Thus, the major components of settlement pattern were indicative of an intimacy with beneficent deities.

Close relationship with animals. This premise was not demonstrated, except in the provision of corrals for animals, near the cluster. This does not reflect overwhelming support for the closeness between humans and the game animals of mythology.

Summary. Several of the premises were exemplified in the traditional Navajo settlement pattern. There were features of the settlement per se that showed consistency, in addition to those features relating to its basic element, the female hogan. However, the fluidity of the clusteral organization seemed inconsistent with the premise of order. The degree of agreement between settlement and the premise of closeness with animals was almost nonexistent.

The Navajo Built Environment

The results indicate that there is a consistent relationship between the built forms under consideration and Navajo epistemology.

In general, the traditional Navajo settlement was organized in terms of various levels of clusters. The basic component was the hogan of which three were noted: (a) the female hogan or traditional dwelling unit; (b) the male hogan or traditional ceremonial unit; and (c) the sweathogan. The descriptions of all the hogans showed their similarity. A consistent relationship was shown between hogan forms and Navajo epistemology. Since the settlement was highly dependent on the female hogan for its organization, it too had a consistent relationship with Navajo epistemological premises.

When results were compared across environment components, four findings were evident. First, consistency between an environment structure and epistemological premises was manifested in this culture, and similarly across the structures considered. Thus the results were not solely specific to one Navajo built form. Second, the dependency of settlement pattern on female hogan was noted. Third, the interrelated nature of the premises was reflected in the fact that the same feature could be considered to support several premises. Fourth, there were instances of inconsistency of specific premises with specific environment components. These will be elaborated for further consideration in Chapter 6.

In the following section, the same traditional built forms (dwelling unit, ceremonial unit, and settlement pattern) of another culture are considered in a manner similar to the format of this section. In this way, it is possible to demonstrate that consistency between built environment and epistemology extends beyond the Navajo culture.

TRADITIONAL BUILT FORMS OF THE ZUNI CULTURE

Three Zuni built forms are the focus of this section:

- (a) the traditional dwelling unit, known as the Shalako house;
- (b) the traditional ceremonial unit, known as the kiva; and
- (c) the traditional settlement pattern, known as the pueblo.

For each of these, the salient features are described and then related to the Zuni epistemological premises outlined in Chapter 2 (see also Table 2, pps. 58 - 59).

The Traditional Zuni Dwelling: The Shalako House

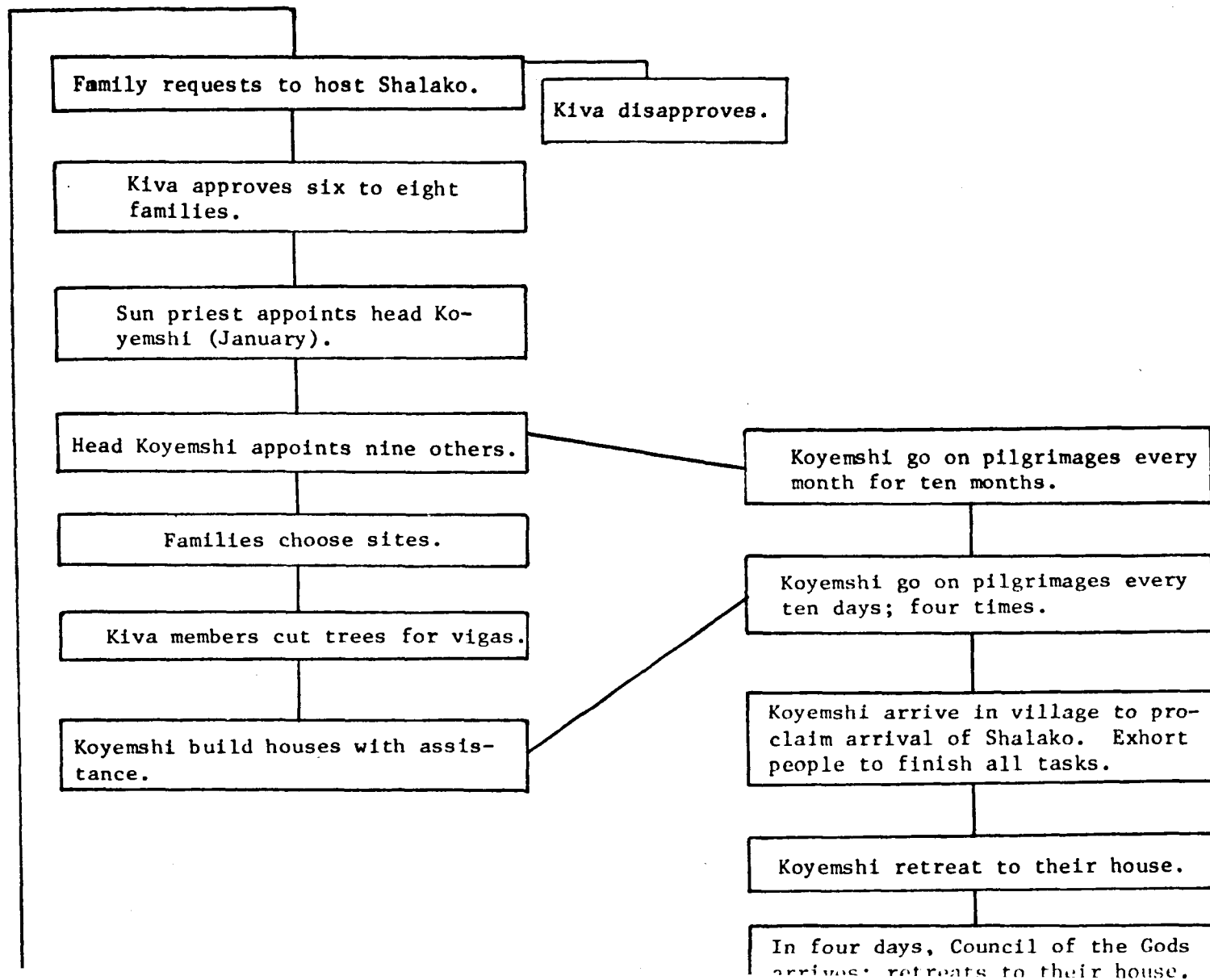
The Shalako house could not exist apart from the Shalako ceremony. In order to appreciate the significance of this dwelling form it is important to describe some aspects of the Shalako ceremony. This celebration concerns Zuni's conceptualization as the Middle Place, found by the Zuni people after years of their clans wandering in different directions to look for it. It is the centre of space, verified by the peace of the ground on which it stands for it has never had an earthquake. Each year at the winter solstice its centredness is verified again and so in one ceremony the creation, migration and arrival to the Middle Place of the Zuni People is celebrated. It is the Shalako ceremony. It is within the context of the Shalako ceremonial that the traditional Zuni Shalako house will be described.

To house the visiting Shalako and attendant gods during the Shalako ceremony, six to eight houses were built and/or renovated each year -- one for each of the six Shalako, one for the Council of the Gods and one for the Koyemshi, the offspring of deity fathers and human mothers (Bunzel, 1932; Cushing, 1896; Stevenson, 1904). This system of housing

delivery is shown in Figure 10 (p. 117). Two Shalako may be housed in the same house, or one Shalako and the Koyemshi (Bunzel, 1932; Stevenson, 1904) which accounts for the variation in the number built. Based on the symbolism of the Shalako ceremony itself, it can be inferred that Shalako homes, like the Shalako, represent the six directions -- north, south, east, west, zenith, and nadir. Whorf (1950) has interpreted these directions as follows: the cardinal directions (north, south, east and west) are representative of the spatiotemporal present, zenith refers to temporal future, and nadir to temporal past. Accordingly, the Shalako houses would represent the unity of space and time. Moreover the Council of the Gods represents the cardinal directions (north, south, east and west) perhaps exemplifying the Zuni creation myth, the transformation of the three worlds of the past into the one we know today and the creation of a spatial present. The Koyemshi, being the product of deity fathers and human mothers (Bunzel, 1932; Stevenson, 1904), may be considered to represent the union of deity and nonhuman. Thus it can be considered that the houses as a totality are a transcendent symbol of unity.

In addition to its religious purpose and significance, a secondary purpose of the house seems to have been the accommodation of increases in family size (see also Kroeber, 1917).

The main house builders were the ten Koyemshi, assisted by members of the community and sponsored by kiva-approved families (Cushing, 1896; Stevenson, 1904). Symbolically, the builders and thus the built form may be said to be part human, part god, part male, part female, part sacred, part secular. The number 10 possibly represented the totality



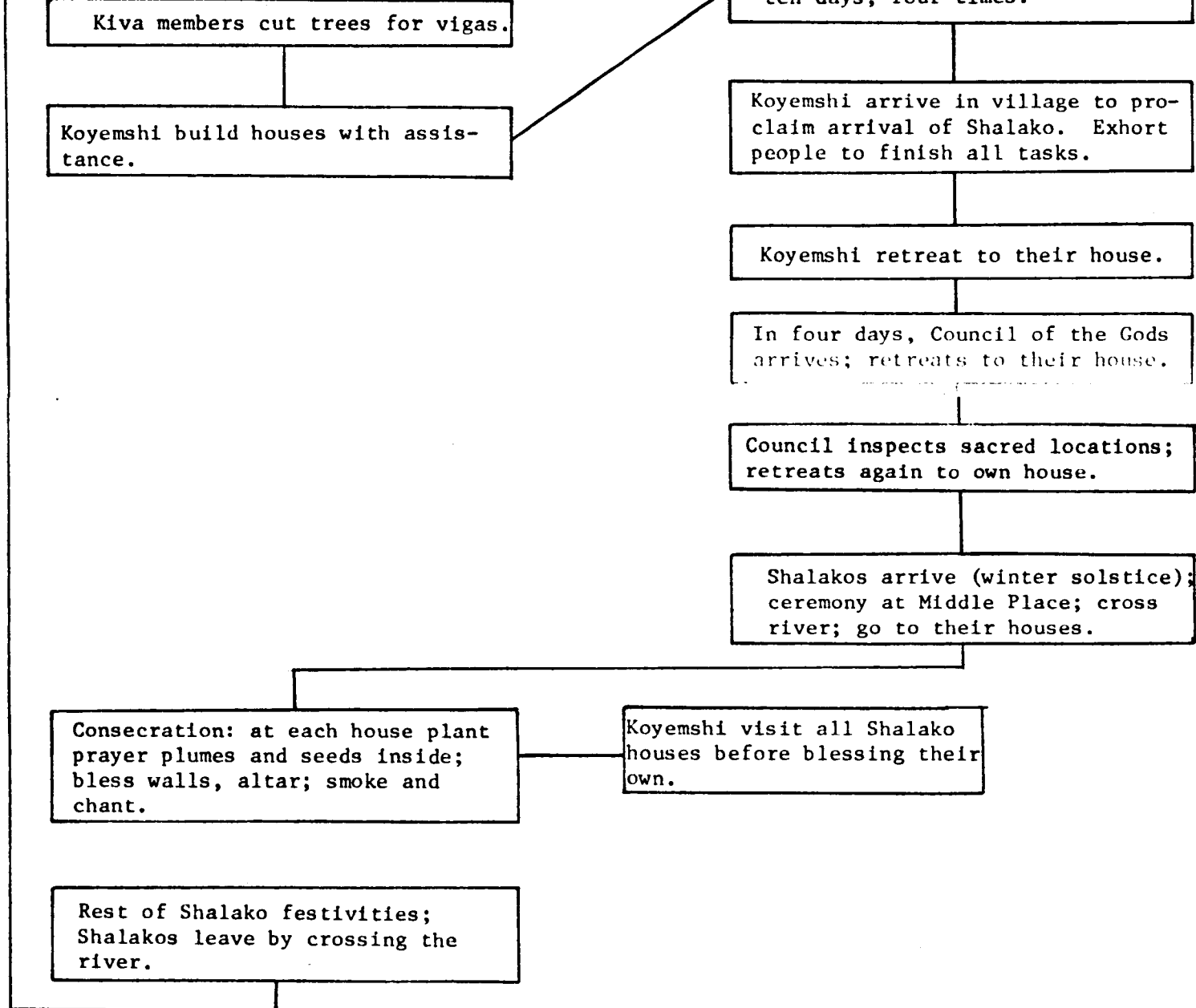


Figure 10: Traditional Shalako House Delivery System of Zuni.

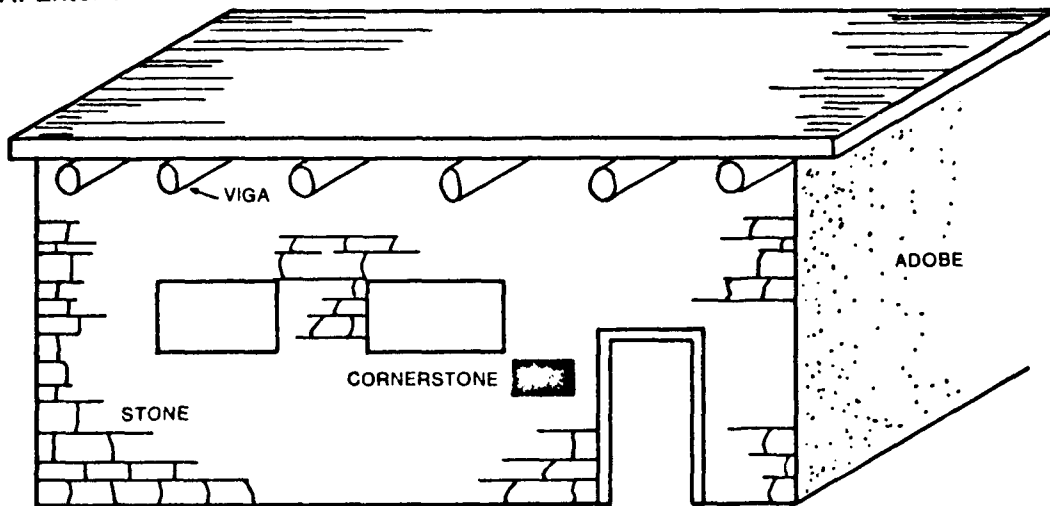
of six -- the union of the six directions and thus of space and time -- and four -- the union of the four cardinal points (Bunzel, 1932; Cushing, 1896; Whorf, 1950). The latter may refer to present spatial unity and/or the transformation of the four worlds.

Before construction, a site was selected within the pueblo. An existing structure still in use might be torn down or renovated (Kroeber, 1917).

The exterior shown in Figure 11 (p. 119) was made of stone and/or adobe, with wood vigas (roof beams), using various techniques of construction (Mindeleff, 1891; Stevenson, 1904). It seems that materials used were any that were available. The house was rectangular with at least two entrances as shown in Figure 11 (p. 119) -- one on each long side. One was used as an exit for the gods and initiated males, the other by females and uninitiates (verified by Zuni Tribal Historian, personal communication, 1976).

The interior space (Figure 11, p. 119) was divided into at least two rooms, but might have as many as eight (Stevenson, 1904). One room ran the entire length of the house and was sunken; the others were raised and separated from the main room by walls. The main room was used by the gods and males; the other(s) by females and uninitiates (verified by Zuni Tribal Historian, personal communication, 1976), and other rooms seemed to be used for extra-ceremonial purposes such as storage, housing various branches of an extended family, and housing masks (Bunzel, 1932; Stevenson, 1904). There were several interior windows between the main room and others to enable the females and uninitiates to watch the gods who visit the house during ceremonies.

A. Exterior



B. Interior

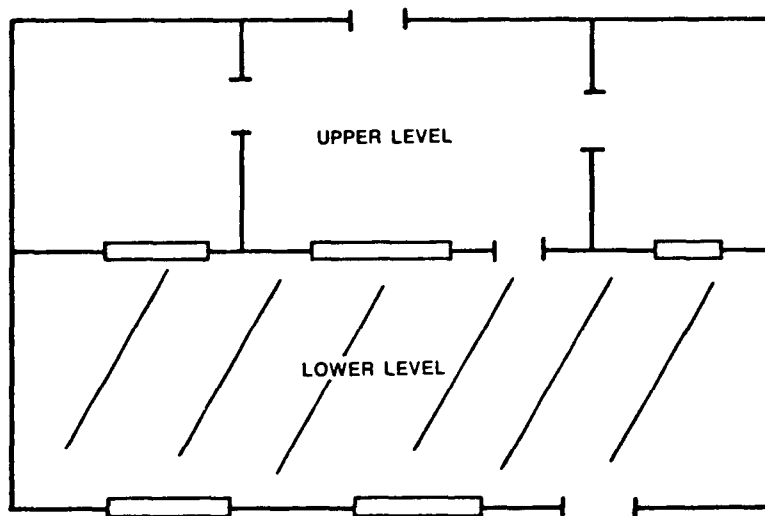


Figure 11 : Zuni Shalako House

Symbolically the separation of the sexes may be exemplified, consistent with the separate but equal sex roles in Zuni culture (Bunzel, 1932). Perhaps the main room was reserved for males because its main function was religious, the others for females because these rooms served the family. Symbolically the separation with connection (via windows) may exemplify the separation, yet unity of male and female. All rooms were linked by communicating doors, probably for ease of access (Bunzel, 1932; Kroeber, 1917; Stevenson, 1904).

By the winter solstice, all the houses were ready for their visitors and consecration by the gods (Bunzel, 1932; Cushing, 1896; Kroeber, 1917; Stevenson, 1904). The gods deposited seeds and male and female prayer plumes at the threshold; feathers were planted in the roof (Bunzel, 1932). They blessed the four walls, the altar suspended from the ceiling and the pit in the floor below in a specific order (Bunzel, 1932); rituals included the mention of everything providing shelter and subsistence. The consecration may be inferred to exemplify the fertility of all living things and thus the unity of all living beings.

When the gods departed, the house was used by the extended matrilineal, matrilocal family that supported its construction (Bunzel, 1932). And if the house was owned by the female head of the clan, the clan fetish also lived there (Bunzel, 1932). It may have been selected to house fraternity meetings as well (Kroeber, 1917).

Etiquette prescribed the seating of persons and things (Bunzel, 1932). The altar was placed at the valuable place, away from the door; strangers were placed near the door; mourners and warriors who had taken scalps sat away from the fire (Bunzel, 1932).

The customs and taboos of housing that have been elaborated here, are termed the normative building code in this report and are summarized in Table 6 (pps. 122 - 124).

The Shalako House and Zuni Epistemology

As previously stated, the premises of Zuni worldview concerned oneness and interdependence interpreted from a nonhuman focus. The key points of Zuni epistemology elaborated in Chapter 2 (see also Table 2, pps. 58 - 59) included a world that was a nonhierarchically ordered universe of human and nonhuman elements. Because everything is alive, each shares the essence of life and is thereby equal with every other element; hence an emphasis on organic harmony. All are interdependent and work for the good of all. The human role is one among many, each necessary but not sufficient by itself to maintain universal balance.

What we are concerned with here is the relationship between these aspects of Zuni epistemology and the features of the Shalako house.

Oneness. The universal oneness of the Zuni epistemology inferred a built environment in which totality was emphasized. To a great extent, this was the case. The building process was one aspect of a year-long preparation for the Shalako ceremony whose major theme was the unity of all creation through the finding of the Middle Place. There was also evidence of links with the nonhuman, for the structure housed gods, humans, fetishes and the dead (through masks). Furthermore, universal totality was exemplified in the consecration, in which everything -- living, dead, human, nonhuman -- played a role. Therefore, there was consistency between the premise of oneness and the Shalako house.

Table 6
Normative Building Code:
Zuni Shalako House

Features	Organization	Function	Conceptualization
Exterior	Materials: stone and/or adobe; wood for beams		Availability (inferred from Mindeleff, 1891).
	Form: rectangular (Stevenson, 1904).		
	Exit: at least 2, one on each long side (verified in field research, 1976).	Exit.	One for gods and initiated males; one for women and uninitiates (Zuni Tribal Historian, 1976).
Interior	Space divided into two to eight rooms; one is entire length of house and sunken; others raised and separated from main room by walls (Stevenson, 1904).	Separates ceremonial participants (Zuni Tribal Historian, 1976).	
	Several windows between main and other rooms (Stevenson, 1904).	Enable females and uninitiates to watch gods (Stevenson, 1904).	Separation and unity of participants (inferred from Bunzel, 1932).

	All rooms interconnected (Kroeber, 1917).	Ease of access; protection (inferred from Kroeber, 1917).	
Location	Site within pueblo. Existing structure may be torn down in order to build it (Kroeber, 1917).	Within-community expansion (inferred from Kroeber, 1917).	
Number built	Six to eight, annually (Cushing, 1896; Stevenson, 1904).	To house several groups of deities involved in ceremony (Stevenson, 1904).	Interdependence (inferred from cultural symbolism).
Builders	10 Koyemshi, assisted by members of the community and sponsored by kiva-approved families (Bunzel, 1932; Cushing, 1896; Stevenson, 1904).		Exemplify several levels of unification (inferred from Cushing, 1896).
Reasons for construction	For the Shalako ceremony (Bunzel, 1932; Cushing, 1896; Stevenson, 1904).	To house gods (Cushing, 1896).	Required by myth (Cushing, 1896).
	Accommodate increases in pueblo size (Kroeber, 1917; Stevenson, 1904).	Expansion (inferred from Kroeber, 1917).	
Time of construction	Year round, but must be completed in time for Shalako ceremony at winter solstice (Bunzel, 1932; Stevenson, 1904).		Part of Shalako ceremony (Bunzel, 1932; Stevenson, 1904).
Users	Appropriate gods (Bunzel, 1932).		Ceremonial necessity (Bunzel, 1932, Stevenson, 1904).

	Extended matrilineal family (Bunzel, 1932).	Eating, sleeping, storage (Stevenson, 1904).	Consistent with matrilineal, matrilocal social structure (Bunzel, 1932).
	Possibly clan fetish or sacred paraphernalia (Bunzel, 1932).		Clan fetish requires a house (Bunzel, 1932).
Consecration	By gods, during Shalako ceremony (Bunzel, 1932; Stevenson, 1904).		Indicative of fertility of all living things; union of human and nonhuman species (Bunzel, 1932).
Ownership	Female head of family (Bunzel, 1932).		Consistent with matrilineal, matrilocal society (Bunzel, 1932).
Length of inhabitation	Permanent, though may be torn down to build new one (Kroeber, 1917).		
Function		To house humans and nonhumans. Multiple use includes possible use as clan house, fraternity house (Bunzel, 1932; Steven- son, 1904).	
Etiquette	Seating of persons and things -- altar at valuable place, away from door; strangers near door; mourners and warriors having taken scalps, away from fire (Bunzel, 1932).	Perceived safety (inferred from Bunzel, 1932).	

Consider also the union of all interior spaces of the house by interconnecting doorways and the use of interior windows to unite sacred and secular spaces, males and females. Moreover, unity was shown in the requirement that six to eight houses be built simultaneously to exemplify symbolically a spatio-temporal and community oneness. This consistency was strengthened by the fact that the new houses were sited within the existing totality of the pueblo. Universal unity was shown symbolically in the choice of Koyemshi as the major builders and the manner in which the entire community was linked in the building process.

Interdependence. Interdependence of parts was shown in mutual need of each part to complete the totality. For example, the interior required two sections interconnected by windows so that all segments of the human population could participate in ceremonies held in the house. Moreover six to eight houses were required, each housing different deities yet each a necessary part of the ceremony. In a similar way, the building process and the buildings themselves were an interdependent part of the year-long ceremonial activities. Furthermore, both the building and the ceremony required the cooperation of aspects of the universe for different but closely related tasks. Therefore the Shalako house in terms of process and product was consistent with the premise of interdependence.

Organic harmony. The idea of environment as organism was shown in the Shalako house. Each newly constructed house could be likened to a birth, for it had a birthday -- in the sense that each former Shalako house was cleaned and renewed with mud plaster and reconsecrated by the Shalako ceremony every year (Bunzel, 1932). This was also consistent with the renewal theme of the ceremony. Like an organism, the house

could grow through the addition of rooms at later times, decay, and even die, i.e. be left in ruins (as explained by Cushing, 1920). It may be inferred that the planting of fertility symbols in the house was, on some level, indicative of its growth. Therefore the premise of organic harmony was supported.

Nonhierarchic order. The premise of nonhierarchic order is so closely related to that of interdependence that they were similarly manifest in the Shalako house. In addition to the interconnected sections of the interior, the necessity of six to eight houses and the relationship of house construction to other ceremonial activities, this premise was supported in the consecration and seating arrangement. The specifications of consecration of areas within the house, and of the houses, reflected an orderly procedure.

Nonhuman focus. The premise that humans are part of a larger totality was shown in this structure. There were many examples of the use and dependence upon nonhumans for the Shalako house such as the use of Koyemshi, the housing of nonhumans during and after the ceremony, the construction deadline being determined by nonhuman convenience, and the reliance on nonhumans for consecration. Note also that in the process of consecration the gods emphasized the fact that the human was part of a universal system.

Summary. In general, consistency between epistemology and the features of the Shalako house was demonstrated. The interrelated nature of the epistemological premises was shown in that the same feature was consistent with many of the premises.

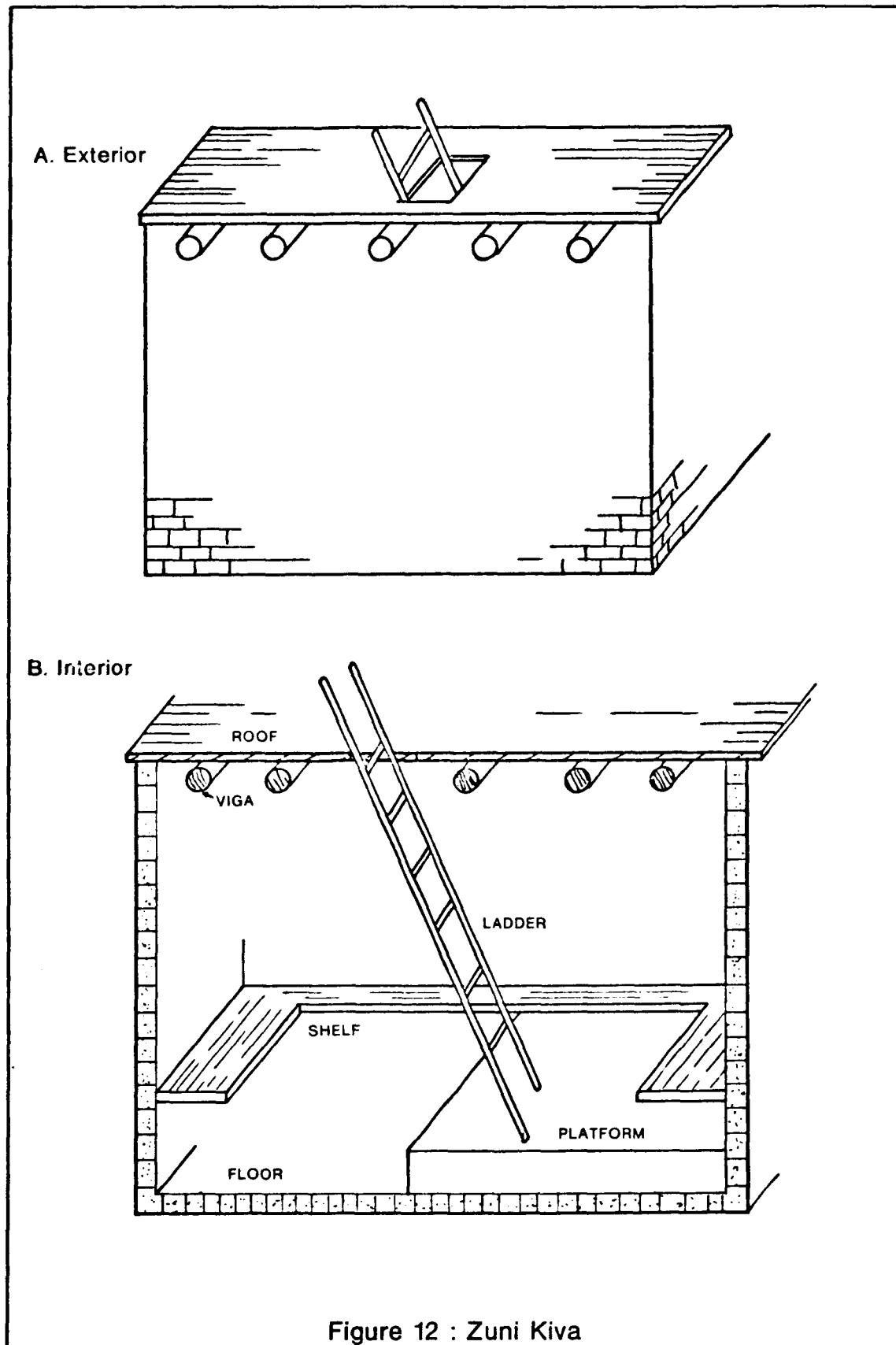
The Traditional Zuni Ceremonial Unit: The Kiva

In the previous section, the dwelling unit which had an important ceremonial significance was described. However, there was another structure which had religious importance, the kiva. Historically, the kiva was of prime importance but with the passing of the period of the great kivas (circa 1300 A.D.) it decreased in prominence. By the time period under study, it seemed to be more of an adjunct than a key building structure. In this section we will describe its features and then examine their relationship to Zuni epistemology.

The kiva was a sacred building housing certain religious ceremonies (although most took place on the courtyards) and religious paraphernalia, including an altar. It was also a place of religious instruction and was used as a dressing and rehearsal room for impersonators of the gods. Each of the six kivas was located within the pueblo near or adjoining an enclosed court, the traditional site (Kroeber, 1917; Mindeleff, 1891; Rapoport, 1969). Each represented a direction (Bunzel, 1932; Cushing, 1896; Kroeber, 1917; Mindeleff, 1891; Stevenson, 1904) and perhaps together they represented the unity of the six directions (see Cushing, 1920; Whorf, 1950).

Kivas were built by prospective male members; related females were involved in minor construction (Mindeleff, 1891), consistent with the male dominance of religious activities (Bunzel, 1932; Cushing, 1920; Stevenson, 1904).

The exterior shown in Figure 12 (p. 128) was composed of materials similar to those of the Shalako house (Mindeleff, 1891) including stone, wood and adobe. Its form was rectangular which made it difficult to



distinguish from house form, except for its entrance through the roof (Mindeleff, 1891). Mindeleff (1891) suggested that this form was adopted during the period of religious persecution by the Spanish, to avoid detection. The opening in the roof was the only exit (Mindeleff, 1891) and may have been symbolic of the hole of emergence to the fourth world (Bunzel, 1932). Orientation was solstitial, with the opening facing southeast (Krawetz, 1976). Symbolically this may be representative of a link with the sacred sun (Bunzel, 1932).

The interior shown in Figure 12 (p. 128) consisted of several levels: the ground, a shelf along the walls, a raised platform, and the roof (Mindeleff, 1891). These levels may have represented the four worlds. There was a ladder from the platform through the opening in the roof (Kroeber, 1917; Mindeleff, 1891; Stevenson, 1904) and a fire was in the centre of the floor, beneath the opening (Mindeleff, 1891) probably for ventilation. Considering cultural symbolism, the fire, representative of the sacred sun (Bunzel, 1932) may have been linked to the sun through the opening. The altar was oriented east to get the first light of day (Bunzel, 1932; Mindeleff, 1891; Stevenson, 1904) and again a link with the sun is proposed.

There was no mention in the literature of consecration procedures for a completed kiva; yet it is difficult to imagine that such a structure would not be blessed. So sacred was the kiva that passersby were not allowed to look inside (Bunzel, 1932). Members of the kiva were its primary users though spectators were welcomed during ceremonies.

The kiva building customs described are termed normative building code in this report and are summarized in Table 7 (pps. 130 - 131).

Table 7
Normative Building Code:
Zuni Kiva

Features	Organization	Function	Conceptualization
Exterior	Materials: stone, adobe and wood (Mindeleff, 1891).		Availability (Mindeleff, 1891).
	Form: rectangular (Mindeleff, 1891).	Safety; blends with house form; to avoid religious persecution by Spanish (Mindeleff, 1891).	
	Entrances: opening in roof (Mindeleff, 1891).	Entrance/exit (Mindeleff, 1891).	Symbolic of going down into former worlds (inferred from Cushing, 1896).
	Windows: covered (Bunzel, 1932).	To hide activities (Bunzel, 1932).	Activities within are sacred (Bunzel, 1932).
Interior	Four levels: ground, ledge raised platform, roof (Mindeleff, 1891).	Ground for dancers; ledge for seating; platform for spectators; roof for exit (Mindeleff, 1891).	Represents evolution of four worlds (inferred from Mindeleff, 1891).
	Fire: in centre, beneath roof opening (Bunzel, 1932; Mindeleff, 1891; Stevenson, 1904).	Warmth, ventilation, light.	Link with sacred sun (Bunzel, 1932).

	Altar: oriented east (Mindeleff, 1891)	Gets light first (Bunzel, 1932).	Link with sacred sun (Bunzel, 1932).
Location	Within pueblo near or adjoining enclosed court (Mindeleff, 1891).	Defense? (Mindeleff, 1891).	Tradition (Mindeleff, 1891).
	Orientation: solstitial (Krawetz, 1976).		Link with sacred sun (Bunzel, 1932).
	Doorway faces southeast (Bunzel, 1932).		Link with sacred sun (Bunzel, 1932).
Number built	Six, one for each direction (Kroeber, 1917).		Unity (inferred from Bunzel, 1932).
	Built as needed (Kroeber, 1917).		
Builders	Male, prospective members. Finishing work done by females (Mindeleff, 1891).		Consistent with male dominance of religion (Bunzel, 1932).
Reasons for construction		House religious ceremonies and paraphernalia (Mindeleff, 1891).	Tradition (Mindeleff, 1891).
Users	Ceremonial participants (kiva members), sometimes spectators allowed (Mindeleff, 1891).	Ceremonial (Mindeleff, 1891).	
Time of use	In preparation for or during a ceremony (Mindeleff, 1891).		
Etiquette	Passerby must never look in (Bunzel, 1932).	Respect (inferred).	Inner activities are sacred (Bunzel, 1932).

The Kiva and Zuni Epistemology

In brief, the premises of concern deal with order and oneness from a nonhuman perspective. Each premise will be examined in terms of its relationship to the kiva.

Oneness. The physical and social features of the kiva showed consistency with the Zuni notion of universal oneness for they were interconnected with the dwelling units and thus were integrated with, rather than separated from, the rest of the community. Moreover, there were six -- each representative of a different direction but together symbolizing spatial unity. Several physical features symbolized the sun (e.g. orientation, position of openings), the father of all (Bunzel, 1932) which could be inferred as connecting the kiva with everything. The interior levels symbolized the evolution of living matter (through the transformation of the four worlds), thus uniting it with everything. And finally, union was shown in its purpose which is to house ceremonies in which humans communicate and mutually participate with nonhumans (Bunzel, 1932).

Interdependence. Interdependence was exemplified in the requirement that individual structures and/or elements thereof could not exist alone. Consider the six kivas, each a distinct entity, separated by distance and yet in terms of what they represent, each requiring all the others. Similarly, the interior levels were symbolically and functionally interdependent.

Organic harmony. Kiva as organism was manifest. The structures were conceptually eternal in that there were always six. In terms of its use in the celebration of the life essence (see the description of nonhuman focus which follows) organicity was also shown.

Nonhierarchic ordering. The idea of ordering was manifest in the kiva. The symbolic ordering of the kivas and of their interior levels was consistent with stability of arrangement. The north kiva was the most prominent (Cushing, 1896; Kroeber, 1917) as the first among equals and there was a sequential ordering of the rest. The same could be said of the interior levels. The fact that each kiva was built and used by its own members was indicative of order, but again sequential ordering was implicit. Thus this premise was shown in the kiva's features.

Nonhuman focus. Although the kiva was built by humans it was used by the gods and housed their paraphernalia to celebrate universal facets of life (e.g. fertility). The universality of the celebration is essential to understanding the exemplification of this premise. For example, when fertility was celebrated it meant not only human fertility but that of animals and plants, indeed of all living matter. Similarly, the interior representation of the four worlds was a reminder that human evolution was vegetative in origin (Levi-Strauss, 1958). Thus in the sense that the kiva was built for the purpose of celebrating the life essence, its focus can be considered to be nonhuman.

Summary. Consistency between epistemology and kiva was shown, in general, though the hierarchic rather than the nonhierarchic nature of ordering was demonstrated. Again many of the premises were shown to be interrelated.

The Traditional Zuni Settlement Pattern: The Pueblo

The Zuni settlement pattern consisted of a main community and several farming communities (Leighton & Adair, 1963; Mindeleff, 1891). The building code is summarized in Table 8 (pps. 134 - 136).

Table 8
Normative Building Code:
Zuni Settlement Pattern

Features	Organization	Function	Conceptualization
Form -- general	Compact, centralized pueblo totality with seasonally used "feeder" communities (Mindeleff, 1891).	Defense? (Mindeleff, 1891). Incorporates total needs of community (Mindeleff, 1891).	
-- pueblo	All unit types incorporated and connected (Kroeber, 1917). Expansion retains integrity of totality by expanding upwards (Kroeber, 1917; Stevenson, 1904). Adheres to directional (Cushing, 1896) and/or orientational principles (Kroeber, 1917). Expansion occurs within "natural" boundaries (Kroeber, 1917). Wall around community (verified in Krawetz, 1976 field study).	Defense (Mindeleff, 1891). Defense (verified in Krawetz, 1976 field study).	Directional: a part of the manifestation and unification of the six directions (Cushing, 1896).

Location

-- pueblo

Site has religious significance (Cushing, 1896).

The Middle Place (Cushing, 1896).

Near adequate water supply (Cushing, 1896).

Survival (inferred).

-- farms

Near farmlands (Mindeleff, 1891).

Convenience (inferred).

Structural components

-- pueblo

Six kivas (Bunzel, 1932; Cushing, 1896; Mindeleff, 1891).

House ceremonies and religious paraphernalia of each kiva group (Mindeleff, 1891).

Manifests the sacred six directions (Mindeleff, 1891).

Six to eight Shalako houses built annually (Bunzel, 1932; Stevenson, 1904).

House gods, fetishes and human families (Bunzel, 1932; Cushing, 1896; Stevenson, 1904).

Required for Shalako ceremony (Bunzel, 1932; Stevenson, 1904).

Support structures: ovens, wood drying racks, corrals (Mindeleff, 1891).

Necessity (inferred).

-- farming communities

Detached pueblo-style houses (Mindeleff, 1891).

Dwellings near farms.

Support structures, ovens, wood drying racks, corrals (Mindeleff, 1819).

Necessity (inferred).

Builders

-- pueblo

Shalako house: major construction by Koyemshi (Cushing, 1896; Stevenson, 1904).

Kivas: male members do major construction (Mindeleff, 1891).

On above structures females do finishing-work (Mindeleff, 1891).

Support structures: unspecified.

Koyemshi chosen by tradition (Cushing, 1896).

Consistent with male dominance of religious activities (Bunzel, 1932).

Consistent with social structure (Bunzel, 1932). Male is seminal, thus constructs; female is regenerative, thus renews (as in plastering the walls) (inferred from Cushing, 1896).

-- farming communities

Unspecified; assumed by persons who use farms.

Consecration

-- pueblo

Entire community blessed at Shalako ceremony (Cushing, 1896).

Reaffirms accuracy of location in terms of Middle Place (Cushing, 1896).

The Middle Place (Cushing, 1896).

Users

Zuni or those married to Zuni women (inferred from Bunzel, 1932).

The main site was chosen for its proximity to the Middle Place, that place which is the centre of the world -- the place of balance and harmony (Cushing, 1896). This was affirmed each winter solstice at the Shalako ceremony (Cushing, 1896) previously described (see Shalako house). Although many pueblo sites were chosen in terms of defense, it has been argued that this site is not particularly defensible (Mindeleff, 1891). But it was near a water supply, the Zuni River, necessary for survival (Cushing, 1896; Mindeleff, 1891).

The main community shown in Figures 13 and 14 (pps. 138 - 139) was a series of interconnected blocks of dwellings and kivas several stories high (Kroeber, 1917; Stevenson, 1904) arranged around the ruins of a Roman Catholic church. Ovens were near the homes; corrals were on the outskirts of the community (Cushing, 1896). Kroeber (1917) remarked that it was possible to walk through the entire community without going outside; and the community was surrounded by a wall. The dwellings were organized in terms of directional and/or orientational principles (Cushing, 1896, 1920; Kroeber, 1917; McFeat, 1960). Cushing (1896) suggested that groups of clans (called phratries) associated with a particular direction lived near its kiva, but twenty years later, Kroeber (1917) could not verify this. Instead he found that newer buildings were oriented toward the town centre, and that new inhabitants built them in the same direction as that section of the town from which they moved (Figures 13, p. 138 and Figure 14, p. 139), indicative of a new principle of organization.

Farming communities were inhabited during the summer (Leighton & Adair, 1963; Mindeleff, 1891) and consis[ed] of small, detached pueblo-

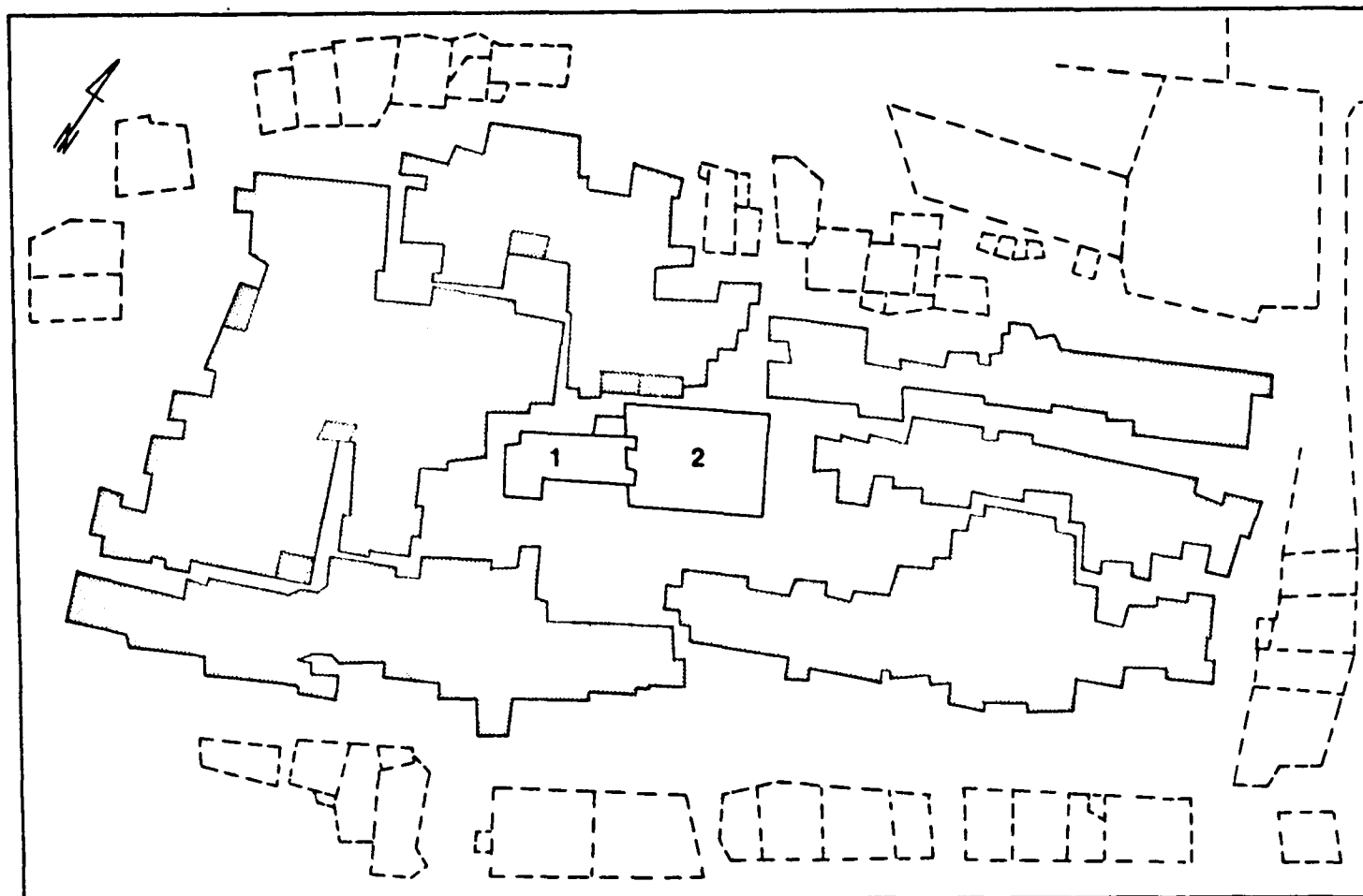


Figure 13 : Zuni Settlement Pattern (from Mindeleff, 1891)

	KIVAS	1 CHURCH
	CORRALS	2 GRAVEYARD
	HOUSES	

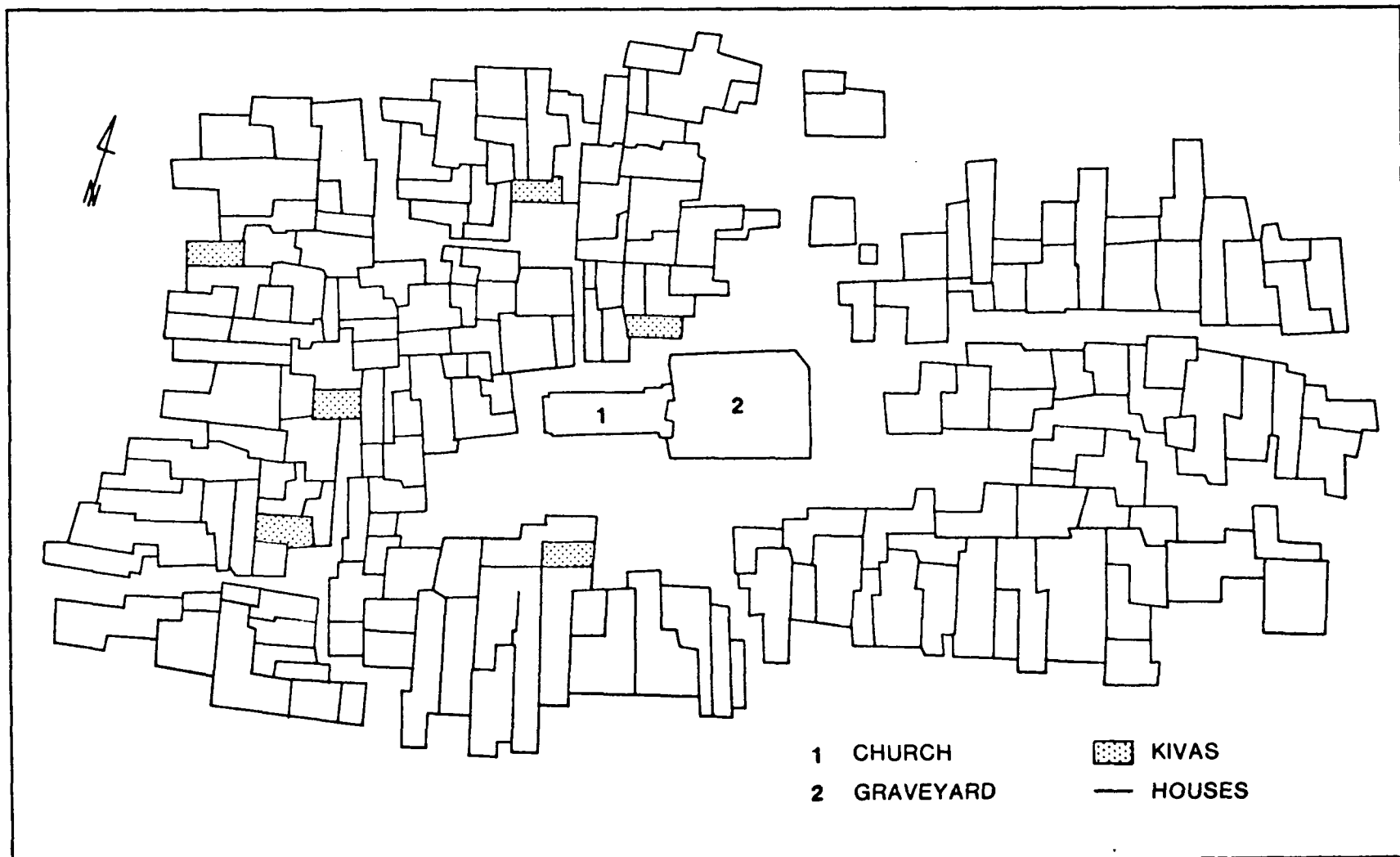


Figure 14 : Zuni Settlement Pattern, 1916 (from Kroeber, 1917)

style dwellings near farmland. No ceremonial structures were found there (Mindeleff, 1891).

The Settlement Pattern and Zuni Epistemology

The settlement pattern was related to the premises of Zuni epistemology as will be described below.

Oneness. The main pueblo exemplified oneness in many respects. Not only were the Shalako houses and kivas considered totalities individually and as groups, but also the entire community was physically united by interconnecting doors, except for the Roman Catholic church (which will be discussed later). The pueblo and the farm communities were united by users, for all were inhabitants of the main pueblo.

Interdependence. Interdependence has been discussed in appropriate passages elsewhere (see Shalako house and kiva). In terms of the entire settlement, the interdependent nature of the main pueblo and farming communities was apparent. The Zuni needed crops for survival and thus needed to be near their farms during the planting and growing seasons; but they also required a permanent settlement with religious significance, with ceremonial structures (Cushing, 1896). The main site was far from the farms but its location was of religious significance (as near the Middle Place) and together the sites provided for the Zunis' needs.

Organic harmony. Several researchers have remarked on the organic development of the main pueblo (Kroeber, 1917; McFeat, 1960; Stevenson, 1904), that is, that its structures were in various stages of growth, decay and renewal, and that this resulted in considerable change over time in detail but not in basic form. Indeed the close links between

the physical growth of the community and the Shalako ceremony affirm an emphasis on growth and renewal. The location of the Roman Catholic church is interesting in respect to this premise. It was an imposed form, introduced by the Spanish in the seventeenth century, and was originally built on the fringes of the pueblo. As the population increased the pueblo expanded eastward for the sharp drop in contour; the Zuni River seemed to provide boundaries preventing expansion in those directions and the flat land in the east was suitable. However, the location of the newer dwelling blocks was such that they surrounded the church ruins and yet avoided them, by maintaining distance (Kroeber, 1917). Eventually it became the town centre and new houses outside the old town were oriented toward it. This pattern is analogous to a mollusk's acceptance of a grain of sand, which is later transformed into something else. However, there is no evidence of such organicity in the farm communities, for they were chosen primarily on the basis of the quality of the land.

Nonhierarchic order. The principle of nonhierarchic order was best shown in the egalitarian status of the farm communities. However, when considered along with the main pueblo the latter was of greater importance, because of its religious significance. The sequential grouping of dwellings around associated kivas (Cushing, 1896) was another example of sequential ordering, all groups being equal. Therefore the settlement exemplified ordering of a nonhierarchic nature.

Nonhuman focus. Settlement pattern was for human use, but on a symbolic level the incorporation of the nonhuman in the process and product was shown (see Shalako house and kiva), stressing the universal orientation of the Zuni culture.

Summary. Consistency between epistemological premises and settlement was demonstrated, in part. The first premise, oneness, was shown within the pueblo but was contradicted in total settlement pattern. The second, interdependence, was manifest on all levels of settlement. The third, organicity was demonstrated only in the main town. The fourth, nonhierarchic ordering, was demonstrated among farming communities but was contradicted in the organization of the main town and the entire settlement. The final premise, nonhuman focus, was shown only in the main town.

The Zuni Built Environment

The results indicate that there is a relationship between the built forms under consideration and Zuni epistemology.

The main settlement consisted of a series of interconnected blocks of dwelling units and kivas. The settlement seemed dependent on its centre and its kivas for its organization. Although the Shalako house and kiva had exterior similarities, they were quite different in use and in interior. When results were compared across environment components, two findings were evident. First, consistency between an environment structure and epistemological premises was manifested in this culture, and similarly across the structures considered. Thus the results were not solely specific to one Zuni built form. However, there was a greater degree of overall consistency with respect to the Shalako house and kiva, compared to the settlement pattern. Second, the interrelated nature of the premises was reflected in the fact that the same feature could be considered to support several premises.

There were instances of inconsistency of specific premises with specific environment components. For example, the premise of nonhierarchical ordering seemed to be contradicted in the kiva and the settlement pattern. And organicity and nonhuman focus were evident in the pueblo but not in the farming communities. Inconsistency is considered in Chapter 6.

CROSS-CULTURAL COMPARISON

Up to this point, the traditional dwelling unit, ceremonial unit and settlement pattern of the Navajo and Zuni cultures has been described. Within each culture, each environmental component has been examined in terms of its relationship to epistemological premises. For each culture, results have indicated a generally consistent relationship between each environmental component considered and cultural epistemology, and thus a similar relationship across components. In this way, the study results have been described relevant to the hypothesis: that there is congruence between the epistemological premises and components of the built environment in these cultures.

In this section, the results will be elaborated upon by comparing analogous environmental components of the two cultures. Thus in terms of traditional dwelling unit, the Navajo female hogan will be compared to the Zuni Shalako house; in terms of traditional ceremonial unit, the Navajo male hogan will be compared to the Zuni kiva; and in terms of settlement pattern, the Navajo cluster pattern will be compared to the Zuni pueblo. The basis for each comparison will be the way in which each exemplifies the epistemological premises of its culture. To do so requires a reminder of the subtle differences in Navajo and Zuni epistemology.

In Chapter 2, the epistemological premises of the Navajo and Zuni were compared and it was noted that although some of the premises were generically similar (for example both had premises of order) there were subtle differences in premise content. The nature of these differences is briefly summarized.

In both cultures, two superficially similar premises, oneness and order, are explicated. The union of all things is a goal of both; the Navajo are waiting to achieve it at some future time (Reichard, 1950), whereas it is considered already attained at Zuni (Bunzel, 1932). Therefore the Navajo presently conceive of unification on a small scale, such as the union of bodily constituents (Haile, 1943); but the Zuni conceptualize universal oneness (Bunzel, 1932; Cushing, 1896). Similarly, order and an emphasis on sequence are part of both epistemologies (Bunzel, 1932; Cushing, 1896; Haile, 1943; Stevenson, 1915; Reichard, 1950). Elements are divided into groups in both systems, each group having a certain status. Navajo groups are hierarchic in that they are based on relative power (Reichard, 1950) and when sequences are considered within groups, the relative goodness and powers of the elements within the sequence are stressed, such as the good sequence -- east, west, south, north -- of cardinal points as opposed to the malevolent sequence -- any other order (Haile, 1943; Reichard, 1950). In contrast, Zuni groups are nonhierarchic in that similarity in life essence and mutual need is stressed (Bunzel, 1932) and although sequence is a factor in Zuni viewpoint, interdependence of elements seems to be emphasized, as in the importance of all four cardinal points in defining space. There is an obvious difference in focus, for the Navajo concentrate on the human,

the Zuni on the nonhuman. To the Navajo, everything is conceived in terms of the human for even the more powerful, nonhuman deities are considered in terms of their power relative to the human (Reichard, 1950); whereas the Zuni focus on the nonhuman, that is on the system as a totality rather than on a particular element (Bunzel, 1932; Cushing, 1896). Thus, where the human is the measure of all things to the Navajo, the human is a small though nevertheless important element of the Zuni world. By implication then, the nature and degree of human-nonhuman intimacy differ as well. In spite of similarities between human and nonhuman elements in Navajo culture, a distinctness is maintained between them. For example, humans are like deities having learned from them various kinds of knowledge to control elements of the universe. Yet humans are not deities, they are merely human. In contrast, inseparability of elements is emphasized in the Zuni system by virtue of its interdependent nature. Living and dead, animate and what the Western world would consider inanimate, are all related.

Whether these epistemological differences between the Navajo and Zuni cultures are manifested in analogous components of their built environments is the subject of the following section.

Traditional Built Environment Components and Cultural Epistemological Premises

Traditional Dwellings: The Navajo Female Hogan and the Zuni Shalako House

Order. The premise of order differed in the epistemologies in that the Navajo emphasis was on sequence and the Zuni on nonhierarchization. In both dwelling forms sequence was manifest. For example, there was a

parallel in the sequential consecration and symbolic meaning of the four posts of the female hogan and the four walls of the Zuni Shalako house. However in terms of the status of the dwelling, the hierarchic interpretation of this premise contradicted in the Navajo culture. The Navajo female hogan was an entity by itself, all hogans being of equal status thus contradicting the hierarchic emphasis of Navajo order. Similarly, each Zuni Shalako house was a distinct entity, but as a totality the relationship of Shalako houses was based on sequential status. The ordering aspect of the premise was similar in both cultures and was similarly manifest. For example, the builders, built forms, ownership of the form and interior placement of persons were specified. But site specifications were more detailed for the Navajo female hogan compared to the Zuni Shalako house.

Oneness. In general, oneness was consistently shown in the dwellings of both cultures. As previously stated, Navajo oneness was formulated on a small usually individual level; whereas Zuni oneness embraced the universe. The difference in interpretation of oneness was shown in terms of builders, users, symbolization of unity and consecration of the dwelling components of each culture. The builders of the Navajo female hogan were male and female, exemplifying human union in the creation of built form. However, the major builders of Zuni Shalako houses were Koyemshi, neither male nor female, deity nor human and hence representative of the union of sexes and human and nonhuman forms. The female hogan was built for the biological family; whereas the Shalako house housed visiting deities, the extended family and possibly other nonhuman members (e.g. fetishes). Female hogans were built one at a time and

signified oneness by their totality and form. This differed from the several levels of unification of the Shalako house: the two interior levels unifying god and human, male and female, sacred and secular; and the collective oneness of the six to eight homes signifying directional unity, temporal unity and community connectedness. Moreover, consecration of the hogan was undertaken by humans; the Zuni entrusted their blessing to the gods. Therefore the differences in the scale of oneness in Navajo and Zuni cultures were shown in features of the respective dwellings.

Intimacy with deity. The Navajo premise of intimacy with deity has no direct analog in Zuni epistemology. However, it is inferred in the Zuni premises of universal oneness with all things and the nonhuman focus of its cosmology. Parallels can be drawn between users or inhabitants of the dwelling form and its physical organization, as examples of how these premises were manifest. The original users of the Navajo female hogan were First Man and First Woman, for whom the Holy People built the first hogan. This prototype was given to the Navajo with the instruction that it was to house a man and woman, i.e. a biological unit and the link between the two sets of inhabitants is obvious. In Zuni, the original users of the Shalako house were primarily deities, but humans lived there also, at the same time. Therefore Navajo intimacy was manifested by mythological precedent and Zuni intimacy was manifested by concurrent use by human and deity, of the same dwelling. This difference is highlighted further in that Navajo builders of the female hogan were males, constructing a dwelling according to the gods' plan; whereas builders of the Zuni Shalako house were children of deity fathers and human mothers.

In addition, the form of the two dwelling types can be compared in relation to this premise. The Navajo female hogan has many features symbolic of deity individually and in combination -- fire, circular form, hoganposts. Thus there is a link between the human and deity through the latter's symbolic representation in the Navajo dwelling. The Zuni interior is organized to separate and connect humans and gods, symbolically and in actuality (in that male kiva members participate with the gods in the ceremonial room). Thus the link between human and god is more direct in Zuni compared to Navajo culture -- at least when considering how this was manifested in the dwelling.

Focus. The difference in focus of Navajo and Zuni epistemology has been noted. This was amply demonstrated in terms of the builders, consecrators and inhabitants of dwellings and the construction norms. As previously described, the Navajo female hogan was built, consecrated and inhabited by humans; whereas the Zuni Shalako house was built by Koyemshi (half human, half deity), consecrated by gods and inhabited by various kinds of living (according to the Zuni) beings. Similarly, Navajo construction norms emphasized human utility and safety; whereas Zuni, stressed the convenience of the deities. The difference in focus is clear.

Relationship to nonhuman. The Navajo and Zuni conceptualizations of the human's relationship to nonhumans -- deities, animals and plants -- differed. To the Navajo it was based on power, for each element was able to control certain aspects of the universe and to the Zuni, everything was a participant in a universal cooperative. The nature of this distinction was shown in the Navajo female hogan when compared to the

Zuni Shalako house, in terms of conceptualization, construction and use. The Navajo female hogan was conceived of as a retreat to separate the human from the uncontrollable world; whereas the Zuni Shalako house was a meeting place for all elements possessing the essence of life. Reinforcing the idea of the hogan as retreat were site restrictions to avoid nonhuman property and the use of good elements to protect the human from powerful forces. At Zuni the opposite situation existed, for deities helped to build and consecrate the Shalako house. Moreover, fetishes, gods, spirits of the dead (including animals, plants), seeds and animals were an integral part of the house. On the contrary, only humans were allowed to use the hogan and if bad spirits invaded, the Navajo abandoned the dwelling. The nature of the difference in human-nonhuman relationship seemed to be the emphasis by the Navajo on the separateness of the human, relative to the Zuni stress on interdependence.

Summary. In this section it has been shown that the differences in the premises of Navajo and Zuni epistemology were manifested in generally consistent differences in conceptualization, organization and function of the traditional dwelling unit.

Traditional Ceremonial Units: The Navajo Male Hogan and the Zuni Kiva

A comparison of the relationship of each culture's ceremonial component to its epistemological premises, is the subject of this section. Manifestations of order, oneness, intimacy with deity, focus and the relationship to nonhumans, are considered in a format similar to that of the previous section.

Order. As previously mentioned, the difference in the premise of order between Navajo and Zuni epistemology was one of hierarchy, i.e.

Navajo stressed hierarchy Zuni, equality. This was supported by the features of the ceremonial component in the Navajo and the Zuni cultures. This was illustrated by the symbolic meaning of the hoganposts compared to the four levels of the Zuni kiva, in which different status is accorded each element, i.e. each post or level respectively, depending upon its priority in the sequence. However, in terms of the status of the structures themselves, the interpretation of the premise in the Navajo culture was contradicted. The Navajo male hogan was an entity by itself, all such structures being of equal status, thereby contradicting the hierarchic aspect of the Navajo interpretation of order. Likewise, each Zuni kiva was a distinct entity, but as a group their relationships were based on sequential status. The ordering aspect of the premises was similarly manifest in the male hogan and kiva. For example, builders, form, placement of exits and orientation were specified.

Oneness. Compared to the Zuni, the Navajo epistemology emphasized oneness on a much smaller scale. This difference was apparent in ceremonial environments in terms of purpose, scale of unification, form and interior feature. The male hogan was a therapeutic structure in which the union of bodily constituents was restored in an individual Navajo; whereas the Zuni kiva was used for human-nonhuman communication through which universal harmony was maintained. Each male hogan was a complete entity by itself and though this was also the case with the kiva, the totality of the six previously mentioned as symbolic of spatio-temporal unity, was stressed. The unity of the male hogan was shown in its circular form; whereas the kiva manifested physical unity in its connectedness to dwellings, thereby structurally unifying the pueblo. Further-

more, particular interior features symbolized unity in the hogan (e.g. the four cardinal posts symbolizing directional unity, the inferred union of east and northeast posts), compared to the interior-exterior union of the four kiva levels, symbolic of the unity and transformation of the four worlds. However, in both the Navajo male hogan and the Zuni kiva, the symbolic unity of the ceremonial unit with the sun was shown in similar ways, as in the eastern orientation of the opening and the placement of the fire.

Intimacy with deity. The difference in intimacy with deity was exemplified in the hogan and kiva, in terms of purpose, construction and features. The purpose of the hogan, as previously stated, was restoration of individual control. This was accomplished through the overpowering of bad deities by allegiance with good. Note how this was reflected physically in the predominance of good elements and the resultant neutralization of bad (e.g. conquering evil north through northeast and east posts). This contrasts with the purpose of the kiva -- communication with the gods to maintain harmony. In this case, only cooperation was manifest and all were unified in task. The kiva interior, in terms of its levels was to allow beings of all four worlds to come together, symbolically. The Navajo built the hogan according to procedures outlined by the Holy People and indeed its form was like the hogan of the deities. Similarity of form united the humans and the gods. No information was available about the origin of kiva form, but it was built by humans and used by humans and gods.

Focus. The difference in focus of the cultures' epistemologies has been implied already. This was demonstrated particularly in the purposes

of the ceremonial structures. The male hogan was used to heal humans, the healing process being primarily directed by the Singer, a Navajo trained in the required songs and rituals for the particular disorder. The kiva was for human-nonhuman communication, and gods and nonhumans as well as humans were included. Moreover, the concern for human safety in siting norms of the male hogan exemplified the human-centredness of its worldview. Siting of the kiva was in terms of directional principles signifying unity of all -- consistent with the universal emphasis of the Zuni worldview.

Relationship to nonhumans. It will be recalled that the Navajo conception of the human-nonhuman relationship was based on relative power and the Zuni on cooperation. This was shown in the conceptualization, construction and consecration of ceremonial structures. The male hogan was thought of as a structure in which to wrest one's body from nonhuman to human control; the kiva was a structure in which all aspects of life essence -- human and nonhuman -- merged to maintain universal harmony. The hogan was built and consecrated by humans according to sacred prototype and in this way, god and human were linked. The kiva was constructed by humans and consecrated through its use by gods.

Summary. In this section it has been shown that the differences in the premises of the Navajo and Zuni epistemologies were manifested in generally consistent differences in the male hogan and the kiva.

Traditional Settlement Patterns: The Navajo Cluster Pattern and the Zuni Pueblo

In this section a comparison of the relationship of each culture's settlement pattern to its epistemological premises will be considered, in a format similar to that of the previous section.

Order. The organizing aspect of both culture's premises regarding order was shown in the orientation of buildings and seasonal use of locales. In the Navajo settlement all buildings were oriented in the same direction; whereas uniformity of orientation was practised only with respect to Zuni kivas. In both cultures, settlement areas were used on a seasonal basis. The Navajo had a main winter hogan cluster and several seasonally permanent clusters; this was similar to the difference in use of the Zuni main town and the summer farming communities. In terms of organization, the Navajo settlement consisted of clusters of increasing size -- loosely organized and at the largest scale not necessarily contiguous. The Zuni pueblo was organized around kivas, and later around orientation to the town centre. Thus, both settlements manifested order, but as has been mentioned previously Navajo order was hierarchic and Zuni was not.

Oneness. Oneness with a difference in size was shown in the settlement patterns. For example, note the increasing fluidity of Navajo clusters as the size increased. It could be inferred that oneness of form thereby decreased -- consistent with Navajo views on small-scale unity. This contrasted with the increasing levels of structural unity at Zuni -- the union of the six kivas, the physical interconnectedness of the dwelling blocks of the entire pueblo and their centred organization (oriented around the church).

Relationship with nonhuman. The Navajo notion of relative power of all elements was manifest in fluidity of settlement pattern organization. It was inferred that the loose structure of the Navajo clusters and their separateness was to dissipate the evil influence of nonhumans.

This contrasted with the relatively compact connectedness of the Zuni pueblo which symbolically unified all living things (e.g. in the Shalako ceremonies), thus exemplifying a close human-nonhuman relationship.

The Built Environment and Epistemology

In both the Navajo and Zuni cultures, there was consistency between epistemology and its manifestation in all components examined. The differences in epistemology were in most cases similarly manifested as differences in the conceptualization, organization and/or function of environment components. The interrelated nature of the premises and consequent interrelatedness of environment features was also noted.

The nonmergent tendencies of the Navajo culture were exemplified in the separation of the dwellings (from each other) and the scattered settlement pattern. This pattern could be attributed to the seasonal variation in catchment, yet each family (rather than clan or settlement) had individual clusters and catchments consistent with a nonmergent orientation. All elements were not oriented in this way. Consider the interior wholeness of the hogan centred around the fire and the numerous symbolic connections to larger nonhuman entities. Moreover, Navajoland was defined by the existence of a border of mountains in the four cardinal directions indicative of a conceptual whole. Thus there were internal contradictions representative of a tension between tm and fm tendencies; but generally the orientation from the mergence was manifest.

The mergence tendencies of Zuni were shown in the blending of interior boundaries in the Shalako house and kiva and in the wholistic conceptualization of Zuni as the Middle Place. This took precedence over economic considerations in that the main town was a considerable distance from arable

land. Yet all elements in the Zuni built environment were not mergence-oriented. Though clustered together, the houses were separate and those built in newer areas were larger and less likely to be connected into large blocks. Although it was possible to walk through the entire settlement without stepping outside because of the presence of interconnecting doors, Kroeber (1917) noted an increase in the number of locks on interior doors to barricade such a possibility. These exemplified nonmergent tendencies. Thus there were internal contradictions representative of a tension between tm and fm tendencies; but on the whole the orientation toward mergence was manifest.

This concludes the description of the results of the archival study, circa 1885 to circa 1925. In the next chapter the influence of Anglo-American culture on the Navajo and Zuni built environment is considered.

CHAPTER 4

RESULTS OF STUDIES 2 AND 3

This chapter contains the results of the second and third studies whose purpose was to focus on the degree of fit between epistemology and the dwelling as it evolved from the archival period to the present day. It was hypothesized that the concomitance of built environment and cultural epistemology would continue to evolve, and would alter as a result of acculturative influences.

From the data presented in the last chapter, the reader may have the impression that each of the built environment structures was a static entity. This is a function of the time period of analysis, for each component of the built environment had evolved to that point and continues to do so. The assumption in this paper has been that in the process of evolution, epistemology is sufficiently robust to accommodate alterations that occur over time. Thus in Study 2, it was hypothesized that even when members of one culture come into contact with those of another, resultant environmental alterations will continue the trend toward consistent fit with epistemological premises.

In this period, the most significant source influence was Anglo America. However this was not the first time these cultures had come into contact with others. Each had a history of borrowing material goods and ideas from their tribal neighbours (including one another) for at least several hundred years (Cushing, 1920; Hill, 1940; Kluckhohn & Leighton, 1946; Leighton & Adair, 1963, Leighton & Leighton, 1944). The areas they inhabited overlapped and trading, as well as warring, relation-

ships were established. After living in such close proximity for such an extended time period it is difficult to discern the direction and degree of mutual influence. The tendency to borrow was manifested more among the Navajo than the Zuni. Being hunters and gatherers, mobility was an important feature of the Navajo lifestyle. Travel increased the likelihood of contact with other peoples. With the cultural emphasis on familistic individualism it is likely that innovation and the adaptation at least of material goods were encouraged (Adair & Vogt, 1949). The ability of the Navajo to incorporate new technology has been documented (Kluckhohn & Leighton, 1946). With a separate language and an agricultural base the Zuni remained in a single major settlement of closely clustered dwellings. There was no need to venture beyond the pueblo, except for expeditions to the sacred Salt Lake, hence Zuni could be likened to an island. Furthermore there was evidence of pressures to maintain conformity (Leighton & Adair, 1963). Thus Zuni was a relatively closed community and innovation was likely to be incorporated slowly if tolerated at all. Thus any changes or lack thereof in the built environment must also be considered in concert with the changing relationship of each tribe to its contact cultures, especially in this case, Anglo-America. Although reservations had been established which were geographically isolated from Anglo settlements, the members of each culture had several sources of contact: the trading posts near reservations, the government agencies, the railroad, and the school system. The most concerted effort to assimilate the tribes was through education. Children were moved from reservations to dormitories and an attempt was made to fit them for Anglo society by

removing all vestiges of their cultural heritage (Kluckhohn & Leighton, 1946). Yet the majority of these students returned to their reservations fit neither for Anglo nor reservation society, being a mixture of both. During this period, the number of Navajo and Zuni employed by the government or in some form of wage work increased, bringing changes to the local economy. There was evidence of economic disparity among individuals within each culture. Money was concentrated in a few families who were beginning to prefer to accumulate it rather than diffuse it in the traditional manner, such as hosting a Sing or a Shalako (Kluckhohn & Leighton, 1946; Leighton & Adair, 1963). Thus any changes or lack thereof in the built environment must also be considered in concert with the changing relationship of these people to the Anglo world. To regard a slice of a systemic whole, such as the built environment, as a frozen entity is to negate the complexity of the interrelationships among constituent parts and to deny the notion of environment as process, as well as product. The experience of each tribe and each tribal member differed. For the purposes of this study the focus is on Anglo-American influence.

It should be noted that during this time period Anglo-American influence was not confined solely to the cultures studied, nor even to indigenous Americans. Its influence was worldwide. Thus one must remember that the underlying trends such as an increasing emphasis on materialism, competition and secularization were part of an influence which extended on a much larger scale. However, the focus of this study is on Navajo and Zuni cultures and how their built environments were influenced by Anglo-America.

It concentrates on the effect between the impacted and impacting cultures regardless of the fact that Anglo-American influence may have had similar consequences elsewhere.

Results of Study 2

Like Study 1, Study 2 was archival and focused on the dwelling unit of the Navajo and Zuni cultures during the time period circa 1926 to circa 1945. Archival sources were content analyzed and information on the dwelling was compared to the criteria tables (Table 1, pps. 54 - 55 and Table 2, pps. 58 - 59) to determine the degree of consistency between the dwelling and traditional epistemology. Each culture was considered separately and then compared.

The Navajo Dwelling

In Chapter 3, the traditional dwelling unit of the Navajo, the female hogan, was described as consisting of one room, about 25 feet in diameter with an eastern entrance and few openings. Many of its features were symbolic of the sacred sun and indeed the dwelling was holy. Further examination showed consistency between this dwelling type and the epistemological premises of Navajo culture -- namely order, oneness and control interpreted from an anthropocentric focus.

In this section, the concern is with dwelling changes in the first few decades of this century. During this period, some female hogans evolved in ways attributable to contact with Anglo-Americans. This kind of dwelling is termed modified traditional, and an example is shown in Figure 15 (p. 160). The kinds of changes and the ways in which they

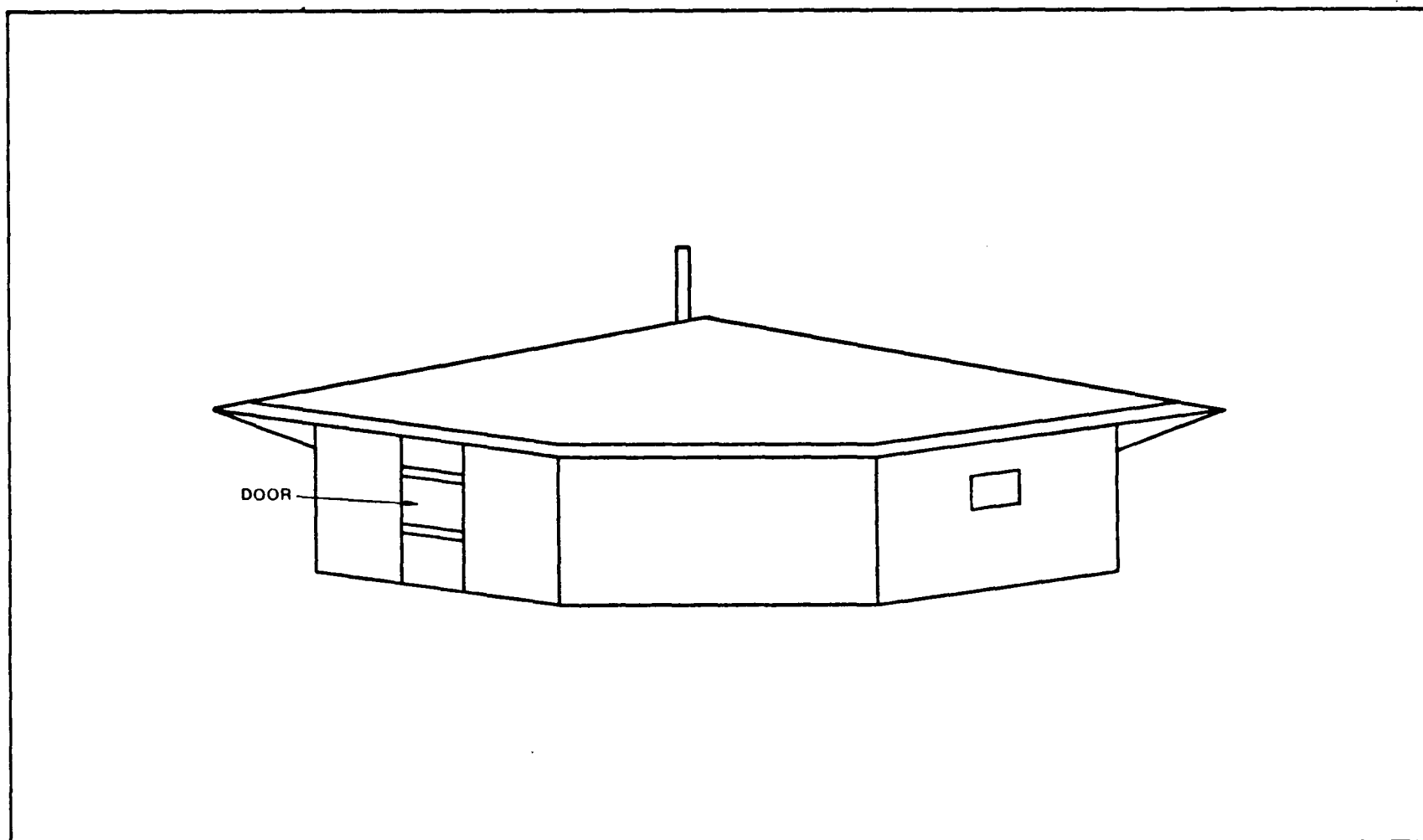


Figure 15 : Navajo Modified Traditional Dwelling

influenced the traditional fit between house form and epistemology will be described. In areas near railroad lines where there was a long period of Anglo contact, more Western-style housing, such as log cabins, was found (Kluckhohn & Leighton, 1946; Landgraf, 1949; Mindeleff, 1895; Spencer & Jett, 1971). This can be attributed to influence by proximity. That is, these areas were nearer to Anglo settlements where the cabin house form was used extensively by Anglos during this time period in this region. And it is likely that these would be areas in which the necessary building materials would be available either because of a nearby forest or a wood products outlet. These homes were usually supplementary and were used for storage or for weaving when it was raining. Thus its use was not the same as that of the originating culture, i.e. as a dwelling. Those which were furnished tended to have Western-style furnishings -- stoves, beds and, less frequently, tables (Kluckhohn & Leighton, 1946). The adoption of such furnishings may have been the result of seeing the traders' houses for their lifestyle influenced and was influenced by the Navajo (Newcomb, 1940). Lockett (1950) suggested that these homes and furnishings were primarily for prestige rather than daily use in the Anglo sense, for these structures had a different name from the hogan and were not used for ceremonial purposes (Haile, 1942).

If the primary use was prestigious, it may have been indicative of a different sort of prestige. Traditional prestige was based on knowledge of chants. Prestige of acquisition was based on ability to purchase through the trading of wool or the pawning of turquoise (Kluckhohn & Leighton, 1946). Here is shown some evidence of increasing materialism to achieve a new kind of status.

The fact that the cabin and the hogan were differentiated indicates that they were not interchangeable, especially since the cabin was usually supplementary and had no ceremonial status. Even in hogans, Anglo building materials such as glass windows and Western-style doors were used increasingly (Kluckhohn & Leighton, 1946), showing again the influence of proximity to Anglos. At this time glass windows became available and Navajos could purchase them at trading posts in exchange for wool, blankets or turquoise. The traditional window was either a hole covered by a curtain or made of mica. The former was neither transparent nor impervious to rain, snow or cold. The latter was scarce, opaque and available only in comparatively small sizes. Glass was available in larger sizes and was transparent and impermeable. Considering the epistemological concern with maintaining the permeability - impermeability of the dwelling boundary, the glass window would be as consistent a fit as the use of mica. Curtains may have been more appropriate in terms of maintaining permeability, but would not have been as effective in terms of interior comfort. Similarly, the wooden door can be opened and thus the opening can be made permeable by choice perhaps giving the user more control over how permeable it is. In terms of comfort (and of keeping out the elements) it is superior to the door - blanket and also can enhance the impermeable nature of the hogan. Although the door was adopted, the taboo against knocking at the entrance for fear of invasion by evil winds continued to be observed (Newcomb, 1940).

There was a reluctance on the part of those living in houses, or hogans with expensive Western features like glass windows, to abandon them in the event of death. Instead they took their dying family members to the hospital (Landgraf, 1949). It should be noted that this action had little to do with seeking effective medical treatment. The person was brought to the hospital only when all traditional methods had failed and the person was deathly ill. In the use of hospitals, the Western facility fulfilled a Navajo purpose. It allowed observance of the traditional taboo against contamination of the dwelling by death of an inhabitant, at a time when building materials were increasingly expensive and as a result reluctance to abandon dwellings increased. The other alternative practised was to abandon the dying on the desert (Leighton & Leighton, 1941). Changes in the practice of abandonment have been noted (Landgraf, 1949; Leighton & Leighton, 1941). In the hogan one abandons it entirely upon the death of an inhabitant lest any part of it be contaminated. It is then razed to the ground or at least remains boarded up and unoccupied. A replacement hogan was built nearby. When Western features were introduced, the same taboos were said to apply. Reluctance to abandon a hogan with Western features was attributed to the necessity of purchasing relatively expensive building materials from the traders, again indicative of an increasing valuation of material goods. In time, although the hogan was abandoned, doors, windows and other "expensive" elements were removed and used in the building of the new dwelling as if the traditional taboos did not apply to these portions,

again indicative of a valuation of the material as well as a differentiation of traditional and western elements. Later, in the use of the house, the differentiation between house and hogan was reinforced by separate rules of use (Sadalla et al, n.d.). Thus it would not be surprising if a house dwelling would not be abandoned although a traditional or modified traditional hogan would be left behind.

The distinction between house & hogan was concomitant with an increasing separation of ceremonial and dwelling form which is the product of a multiplicity of influences. Evidence of secularization of dwelling was reported as early as 1895 by Mindeleff who noted that the eastern orientation was being ignored in some cases (see also Tremblay, Collier & Sasaki, 1954; Sadalla et al., n.d.), though it is difficult to tell whether this increased over time or represented a stable minority of deviant buildings. Researchers have been concerned with the same trends for almost 100 years, yet the magnitude of the change over time is difficult to discern. By the 1940's, less emphasis was placed on an elaborate blessing ceremony (Tremblay et al., 1954). Both of these changes have been attributed to an increase in secularization (Mindeleff, 1895; Tremblay, Collier & Sasaki, 1954; Sadalla et al., n.d.) but are also consistent with the rise of the male hogan as the religious structure and the separation of the female hogan from major religious activities, becoming the domestic base. Yet this was also concomitant with an increasing emphasis on the importance of male activities, since Anglo government officials, missionaries and traders regarded Navajo males as heads of households and of the "state" in their interactions with the tribe, and tended to regard the female in terms of domestic responsibilities

(Kluckhohn & Leighton, 1946). This division was further reinforced in the Anglo education of the Navajo both on and off the reservation. It was also reflected in the compulsory religious education in which only males were associated with religious duties. Thus the secularization of the hogan and the separation of the female hogan or house from the male ceremonial hogan was the result of many forces. The increasing secularization of housing weakened the symbolic relationship between worldview and hogan. When this is considered in concert with the increasing importance of the male hogan, the overall relationship between built forms and epistemology may have remained stable.

Rectangular structures have been noted (Corbett, 1940; Kluckhohn & Leighton, 1946; Landgraf, 1949; Mindeleff, 1895) and also some hogans with more than one room (Corbett, 1940; Mindeleff, 1895), but these appear to have been unusual, isolated instances perhaps indicative that the circular, one room dwelling was more suitable. There was also evidence of individual differences in the extent individual families were acculturated, as evidenced in the level of adoption or adaptation of material goods. Yet the families were not necessarily aware that they differed. This phenomenon has been termed acognitive shift (Roberts, 1951). Thus it is possible that there was a great degree of individual and regional variation in the extent and kind of changes occurring, although the Navajo may not have been consciously aware of the extent to which this deviated from the traditional built form.

Yet in spite of the changes, there was a preponderance of traditional dwellings. This was attributed to several factors: (a) the expense of building a Western-style dwelling especially when a family required more than one (for each catchment); (b) the lack of native skills to build

such a structure; (c) the preference for the hogan because it was better insulated and more spacious; and (d) the preference for the hogan for religious reasons (Kluckhohn & Leighton, 1946). Another reason could be the relative isolation of many Navajo families which are scattered disparately in clusters on the reservation. Yet even many Navajos living in towns who occupied Western-style housing, had traditional hogans as well (Sadalla et al., n.d.). These were country homes located a considerable distance away from the town and continued to serve a religious function.

Of all the changes mentioned, it is difficult to determine which can be directly attributable to Anglo contact and acculturation, and which have occurred because of internal cultural influences or some combination of the two. Even those changes which appear to be a direct adoption of the material culture of Anglo-America are more likely to be a Navajo interpretation thereof, as in the use of the cabin as a storage area or solely for prestige by those able to afford it, rather than as a dwelling.

Thus it seemed that Anglo elements were incorporated because they were useful, in some way affordable and available. In considering these changes it seems that, for the most part, they tended to be accommodated in a manner consistent with cultural epistemology.

The Zuni Dwelling

In Chapter 3 the traditional dwelling unit of the Zuni, the Shalako house, was described as a component of the Shalako ceremony -- a house for the gods. It was rectangular with two entrances and its interior was divided into two levels separated by a wall. Its features were integrally related to the ceremony of which it was a part. Further

examination revealed consistency between this dwelling type and the epistemological premises of Zuni culture -- namely oneness and order interpreted from a nonhuman focus. During the first four decades of this century some Zuni dwellings underwent changes, attributable to contact with Anglo-Americans. This kind of dwelling has been termed modified traditional, and an example is shown in Figure 16 (p. 168). The kinds of changes and the way in which they influenced the traditional fit between house form and epistemology will be described.

On the whole, "progressive" ideas were not practised in any area of Zuni culture (Leighton & Adair, 1963). The major mode of contact was through the Zuni Governor who tended to act as the liaison between the tribe and the Anglo world (Leighton & Adair, 1963). In this way the Anglo world was kept at a distance, i.e. from direct contact with all tribal members. Although the Zuni were polite to attempts to change them, there was a reluctance to adopt technological innovations of any kind even when they could afford them, because of group pressure to conform. Public opinion greatly affected the response to innovation, leading one to expect few changes as a result of acculturation, in the built environment. Yet four changes were noted in furnishings, physical features of the dwelling, dwelling exteriors and support structures. Some material changes included the use of doors and windows that were painted and screened (Underhill, 1938) which, as in the case of the Navajo, would not significantly alter traditional concomitance with epistemology. Again glass could be obtained from the traders and this choice of materials could have been copied from the examples of missionaries and traders nearby. In fact the use of gabled roofs was attributed to copying the parsonage which was built in Dutch colonial style (Leighton & Adair, 1963). And houses were built of concrete blocks and cement once the Zuni gained experience in this mode of

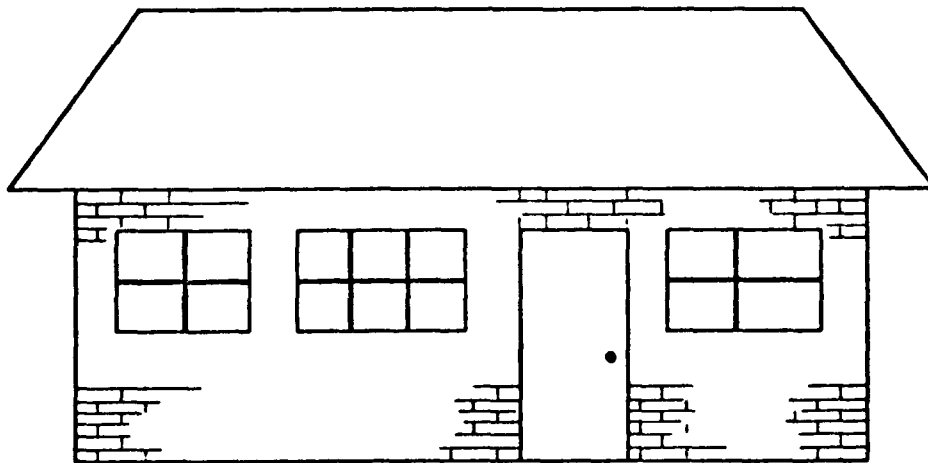


Figure 16 : Zuni Modified Traditional Dwelling

construction in building a dam and a school on the reserve (Leighton & Adair, 1963). Tables and chairs were used, though infrequently (Stevenson, 1904) and Roberts (1956) remarked on the use of privies.

Among the more significant changes was a rivalry among certain families in accumulating furniture and appliances (Leighton & Adair, 1963), indicative of a materialistic, competitive orientation. Moreover, some families no longer wished to host the Shalako, one of the major means of redistributing wealth, because of the expense involved (Leighton & Adair, 1963). Thus the focus began to shift from maintaining universal harmony to the satisfaction of personal wants, concomitant with a more Westernized view. Flower gardens were noted near homes (Underhill, 1938), an indication that Western aesthetics were being adopted although hardly consistent with cultural epistemology. Never before had gardens been used to beautify the home. Rather they had been appreciated in the wilds. This was the first mention that they were cultivated for human aesthetic satisfaction.

Also in this period Zuni changed from a multi-story settlement to one and two stories. Rooms were larger in the newly built areas and Zuni began to expand outside the original town walls with larger, detached houses (Kroeber, 1917). This separation did not fit the traditional conception of organic harmony reinforced by the close clusters of dwellings. However, they did embody a sense of oneness in that they were oriented towards the original town which had become the new centre.

It is possible that there was considerable variation among buildings depending upon the individuals concerned. However there was no documentation available which partialled out these individual differences and their rationale.

Summary

In both cultures aspects of the traditional dwellings changed over time. Some of this change could be attributed to Anglo-American impact, some to cultural evolution and some to a combination of the two.

In both cultures, there were examples of fit and misfit between the modified housing and traditional epistemology. As elements from Anglo-American culture were incorporated, there were several ways in which fit was maintained. In some instances, features were adopted in entirety, as in the use of windows. At times behaviours changed such that fit was maintained. Consider the use of the hospital as a repository for dying Navajo so that houses would not have to be abandoned. Sometimes the element was adapted to meet the needs of the impacted culture. In terms of Zuni, the most appropriate example concerns the kiva which had its windows painted over so that passersby would not violate its sacred nature by looking in. There were also cases of cognitive adaptation, as in the separation of rules applied to the house and the traditional dwellings of both cultures and acognitive adaptation as in changing the built environment without being aware that the change makes it different (Roberts, 1951). At times innovation was rejected completely, as in the flight of Zuni elders to the farming communities or the refusal of Navajos to occupy a dwelling on sacred land.

Moreover, there were several examples of lack of fit. There were variations in the form of individual built environments. Although it may not be possible to explain the source of all the variation, some at least could be ascribed to acculturative influences. Yet basically cultural epistemology was sufficiently robust to accommodate change without totally disrupting concomitance between epistemology and the dwelling. What is

important to stress that the concomitance between epistemology and built environment is a process in continual evolution. Changes in the cultural system, whether internally or externally generated, can, in turn, affect the concomitance of epistemology and environment and the nature of its relationship to the rest of the social fabric.

The mixture of Anglo and indigenous elements must also be considered to reflect changes in other aspects of the social fabric. For example, some members of these cultures were converted to Christianity, leading them to reject previously sacred forms, while others maintained both religions. Changes in the economic base facilitated the concentration of money in a few individuals who accumulated rather than redistributed their wealth through the building of Shalako houses or ceremonial hogans. The school system was an introduction to a new lifestyle and different priorities and thus criteria of appropriateness changed.

In both cultures, the basis of utilizing an extra-cultural element seemed to be that the element had a point of relatedness to the adopting culture, i.e. it had some utility, aside from being affordable and accessible. However once the element was assimilated in this manner, it was put into the context of the adopting culture. In this context it was considered in a way that was not the case in the originating culture. The Navajo use of the hospital is an example. Thus the element is not necessarily adopted outright but rather adapted, if only in the sense that it is placed in another context. As such it becomes not only a point of influence on the cultural context but is also subject to influence by the context in which it is placed. As mentioned previously, concurrent to this process of environmental borrowing was a process of acculturation. To the

extent that this occurred, it provided area of commonality between the cultural contexts. Hence it would seem that borrowing was more likely to occur as points of relatedness and acculturation increased. If there was no utility to the element or no possible relationship, it would seem likely that the element would be ignored. The assimilative process with its fits and misfits is ongoing, though its tempo and spheres of influence shift. In the next study imposed environmental modification is considered in the Indian housing program.

Results of Study 3

In terms of direct influence on the built environment from Anglo-American culture, the period considered in Study 3, circa 1962 to 1975 is particularly important. It marked the beginning of the formulation of Indian housing policy by the U.S. Government.

The first consideration of Indian housing began in 1961, though public housing assistance has been provided through Public Law 75-412 since 1937. Special committees were established to assess the Indian housing need and develop a suitable program of housing delivery. One of the premises of the investigation was based on an idea expressed in the Housing Act of 1949 (Public Law 81-171) that: "every American family should have the opportunity for a decent home and a suitable living environment" (Bureau of Indian Affairs, 1975, p.). In the latter half of the sixties, this goal was incorporated into an Indian housing program.

The need for "decent" housing was amply demonstrated. As of 1966, 65% of Indian houses were categorized as grossly substandard, 30% as unfit for human habitation and less than 5% could meet minimum standards (Indian Affairs Committee, 1975). Furthermore, a link between disease

and poor housing was indicated. Higher rates of certain diseases in the Indian population were attributed to overcrowding, poor water, unsanitary waste disposal, lack of insect control, improper food preparation and lack of refrigeration (Committee on Interior and Insular Affairs, 1975). And it had been shown that the numerous accidents that occurred in and around these homes were attributable to the quality of the housing stock. It was decided that there was a need for house design that was decent, safe and sanitary delivered in an efficient, cost-effective manner.

Requisite housing is provided through a variety of assistance programs: (a) Farmers' Home Administration (FmHA), available through the Department of Agriculture; (b) Veterans' Assistance (VA), available to war veterans; (c) Housing Improvement Program (HIP); and (d) a triagency cooperative comprised of Housing and Urban Development (HUD), Bureau of Indian Affairs (BIA) and Indian Health Service (IHS). HIP is under the auspices of the BIA and provides assistance as follows: "repairs to housing that will remain nonstandard; grants for down payments; new housing when it is established that there is no reasonable prospect that standard housing can be financed from sources other than HIP" (BIA, 1975, pps.). Triagency aid requires the formation of Indian Housing Authorities (IHAs) to carry out low income projects with government approval. In addition, HUD is responsible for its usual functions under the U.S. Housing Act of 1937. BIA provides: a homebuyer training program; assistance in site selection, land acquisition and site appraisal; management assistance; and roads (including access roads). IHS is responsible for the water supply and sewage facilities, including test well drilling and soil percolation tests. It is the triagency program which provides most of the new housing, making

it important to understand the physical features of this house form and the mechanisms of its housing delivery.

Housing Features

As previously stated the house is conceived of as a decent, safe and sanitary structure, designed to: (a) remedy "unsafe and insanitary [sic] housing conditions that are injurious to the public health, safety and morals"; (b) alleviate "the acute shortage of decent, safe and sanitary dwellings for persons of low income"; and (c) provide "employment opportunities through the construction, reconstruction, improvement, extension, alteration or repair and operation of low income dwellings" (HUD, 1976, p. 10157). Before a house is to be constructed, its site must be approved based on several requirements.

The site requirements are: (a) that the site be selected "with due regard for local and regional plans", though there is no requirement that they conform (HUD, 1976, 805.216a); (b) that an access road be provided up to the boundaries of the site, for "safe and suitable vehicular access at all times" (HUD, 1976, 805.216b); (c) that adequate water and sanitation facilities be available (HUD, 1976, 805.216c); (d) that lighting, heating and cooking sources be provided (HUD, 1976, 805.216d); (e) that "the physical characteristics . . . facilitate economical construction and management" (HUD, 1976, 805.216e); (f) that "sites with dominant grades in excess of ten percent . . . be avoided where possible" (HUD, 1976, 805.216f); (g) that "low-lying and flat sites . . . [be avoided] unless practical and economical means of surface drainage can be provided to accommodate the level of rainfall expected" (HUD, 1976, 805.216f); (h) that "topography . . . permit[s] an acceptable arrangement for the proposed number and types of units" (HUD, 1976, 805.216f); (i) that "areas having

unsuitable bearing qualities for foundations and/or underground utilities or excessive areas of rock to be excavated" be avoided (HUD, 1976, 805.216g); (j) that "no site shall be selected if the hazard of earthslides exists either on the site or on adjacent or nearby land" (HUD, 1976, 805.216g); (k) that sites "having special flood hazards" be avoided "unless other reasonable sites are not available" (HUD, 1976, 805.216h); (l) that sites "on individually owned trust or restricted land . . . [have] a valid lease" (HUD, 1976, 805.216k). In conclusion, site restrictions were developed on the basis of short- and long-term economy. A variety of house forms are listed as acceptable: "single family detached, duplex, row house, walk-up, garden type, elevator structures . . . [and] congregate housing" (HUD, 1976, 805.103a), depending on prototype costs. "The factors . . . considered include . . . : local customs; abnormal climatic conditions; the logistical problems associated with Projects of remote locations, low density and scattered sites; availability of skilled labor or acceptable materials; provisions for the use of wood or coal as an alternate heat source; and with respect to trust or restricted land, the unavailability of the legal protection normally available for enforcement of claims by contractors, laborers and material men "(HUD, 1976, 805.213b). HUD "may approve variations from the Minimum Property Standards to meet local conditions" (HUD, 1976, 805.212.

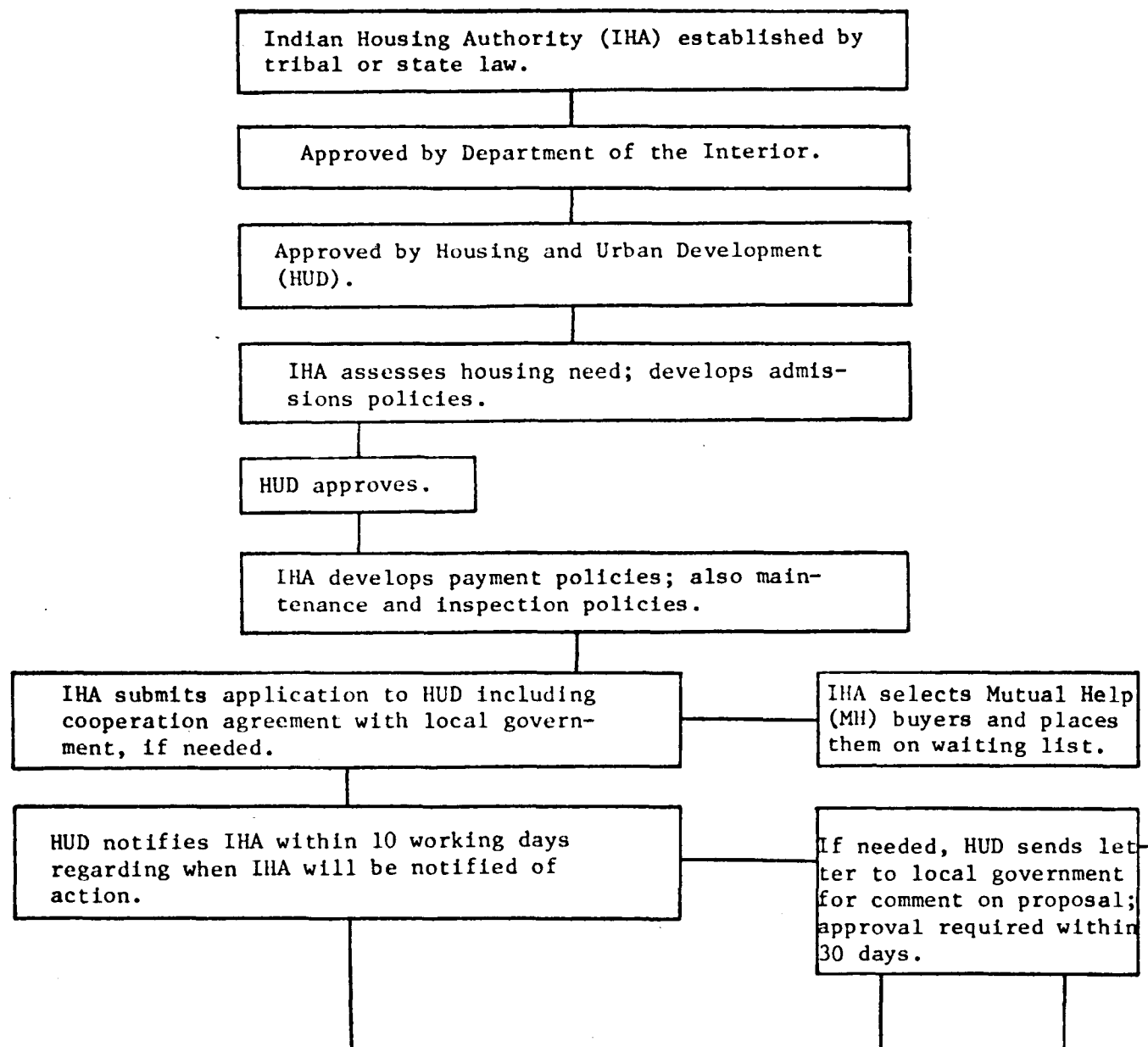
It should be noted that any mention of the consideration of local customs is relatively recent. Even at the inception of the investigation of Indian housing some committee members acknowledged the cultural diversity of the population. It was decided not to promote this diversity in the housing program since it could, in turn, facilitate cultural identities that might be at cross purposes with the national interest. Thus the intent was to provide one standard housing program for all Indian groups (Committee on Interior & Insular Affairs, 1975).

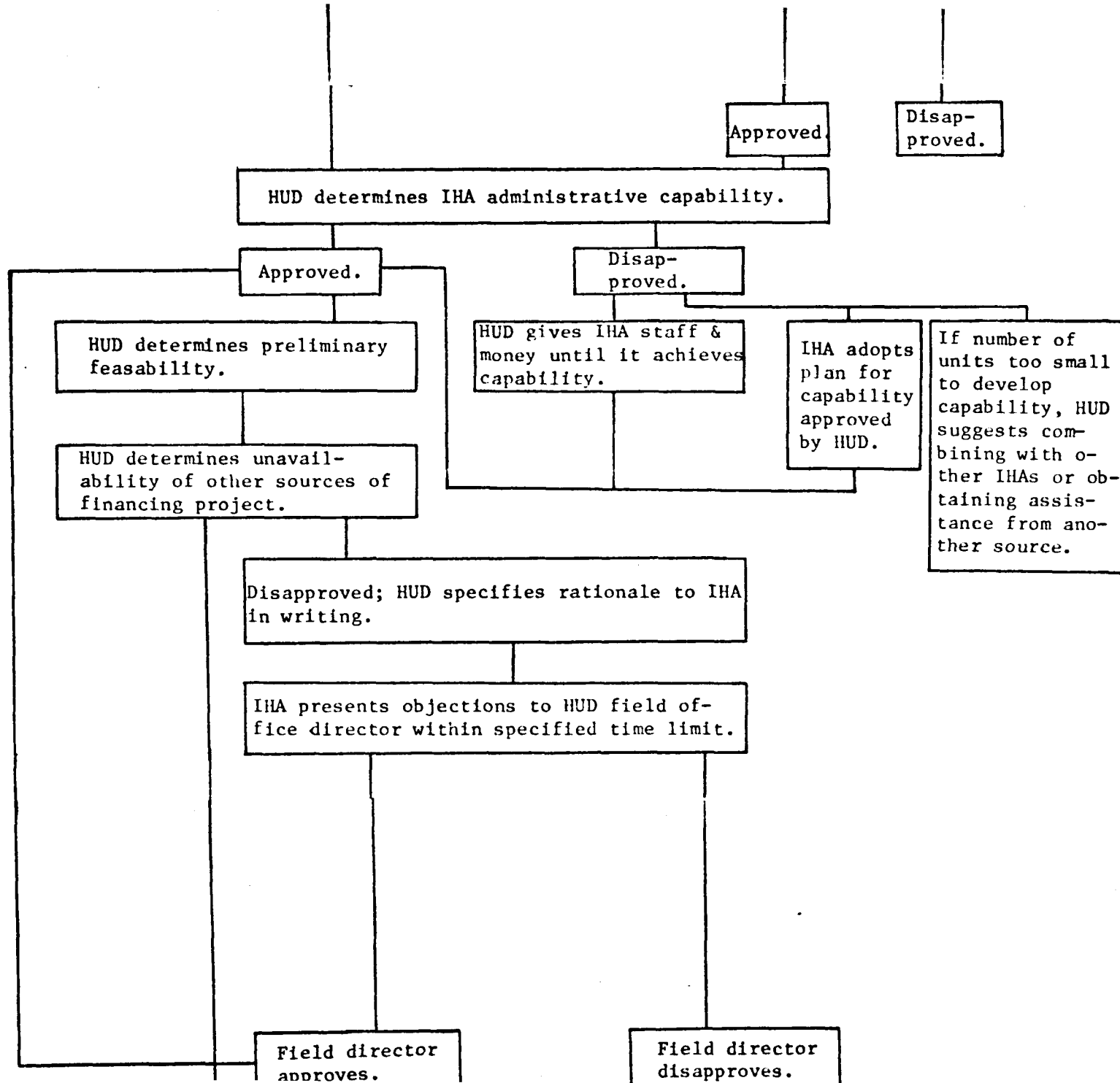
The interior must be of appropriate size for the number of occupants: dwelling; up to seven persons . . .; (iii) four bedroom dwelling: adequate for all but the very largest families" (BIA, 1975, p. 3). Moreover, the heating system must be adequate (BIA, 1975, p. 2); the plumbing system is to include a kitchen sink, partitioned bathroom with lavatory, toilet and bath and/or shower; and the electrical system must have a "minimum of two circuits per dwelling . . . with provision for at least one additional circuit for future use" (BIA, 1976, p. 2).

Housing Delivery

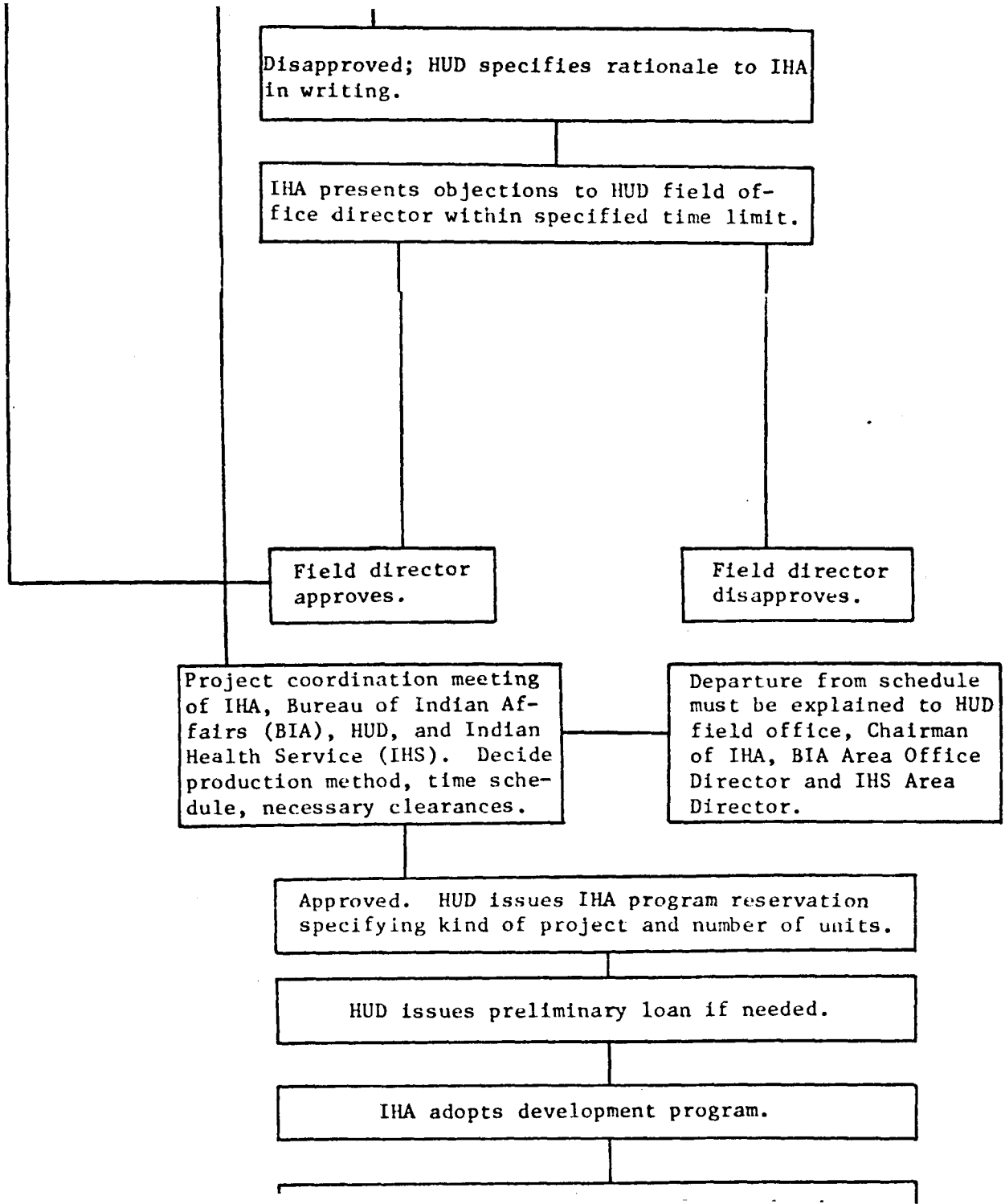
Although the site selection criteria are fixed, the method of triagency housing delivery varies. There are five HUD-approved methods: (a) Turnkey -- in which developers submit housing proposals to the Indian Housing Authority (IHA); (b) Conventional -- in which architects prepare plans and specifications for the IHA which, in turn, contracts for the housing to be built; (c) Acquisition -- in which existing housing is rehabilitated and acquired by the IHA, using the Turnkey method; (d) Force Account -- in which the IHA acts as its own contractor; and (e) Mutual Help (MH) -- in which a family selected by the IHA contributes land, materials or labour toward the building of its house, which is built by a contractor. These methods are outlined in Figure 17 (ps. 172-178).

As becomes evident, the only method in which the occupants of the house are directly involved in its construction is Mutual Help (MH). In all other cases, the potential occupants bear no relationship to the builders of the homes. In addition, depending upon the nature of the





Chief Source.



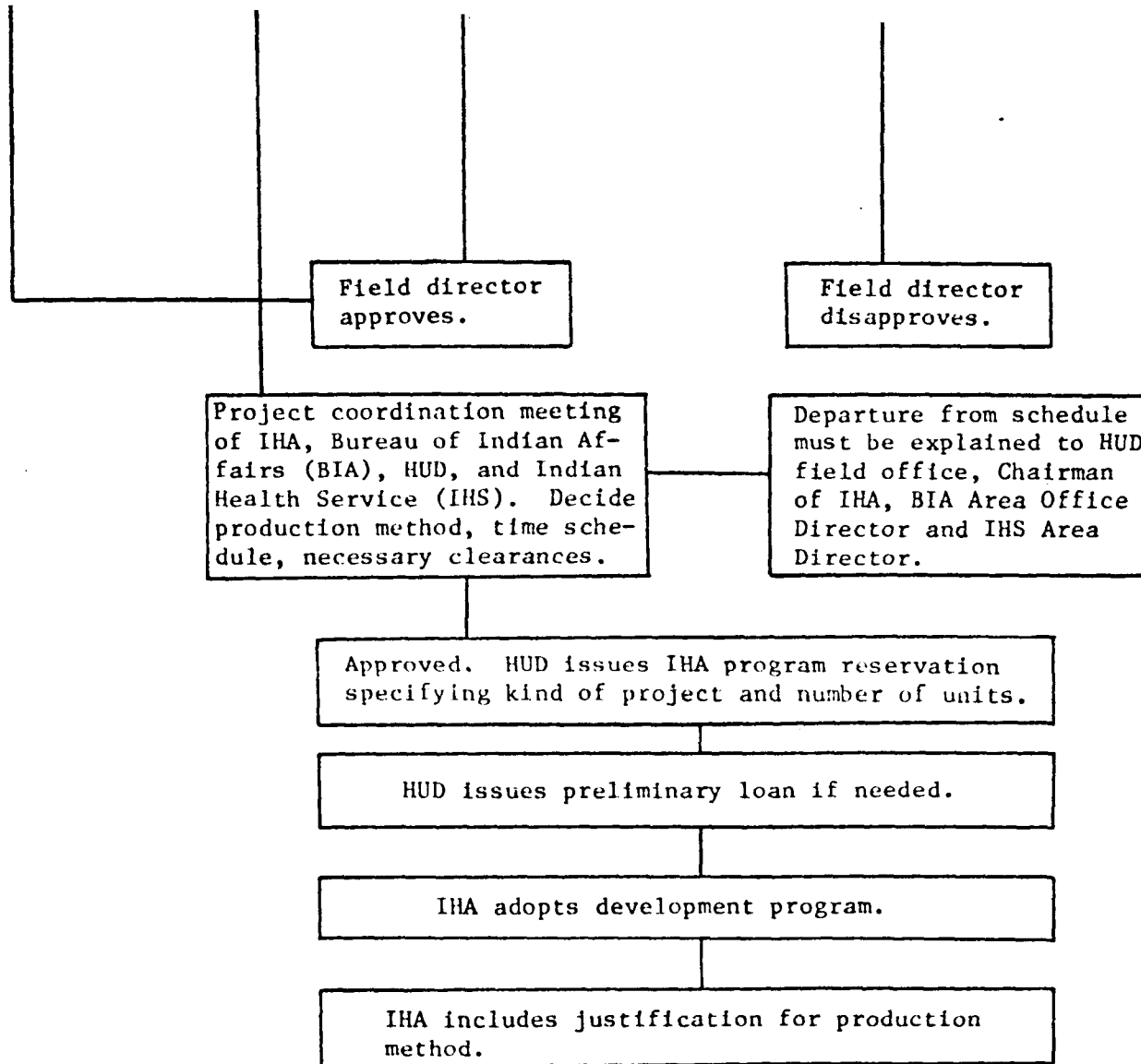
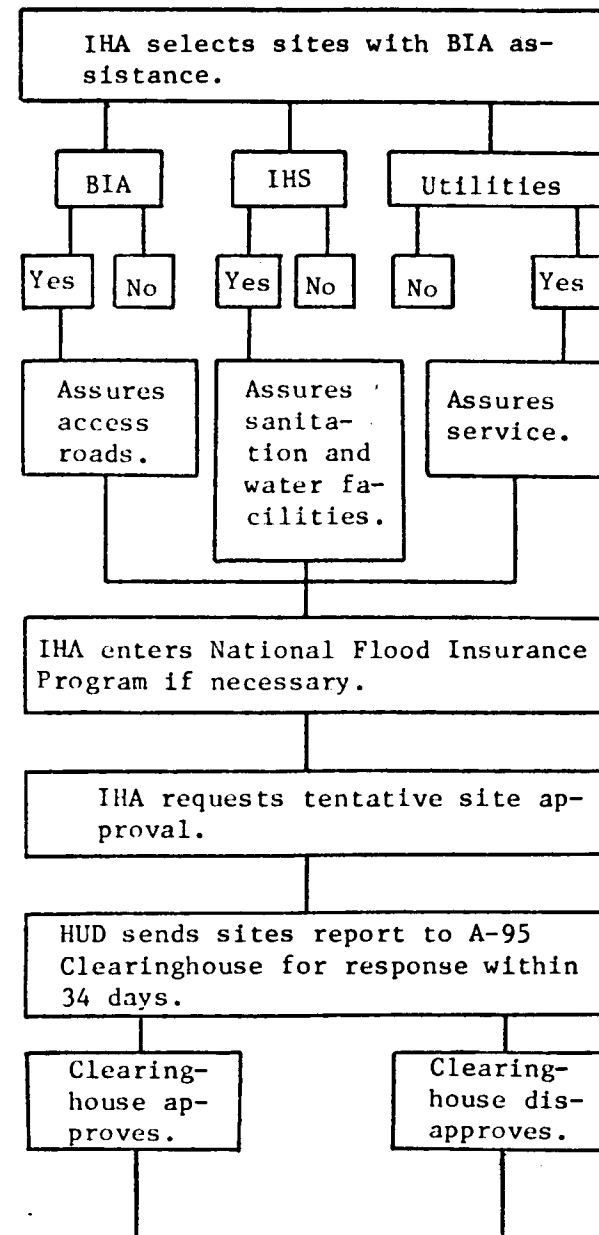
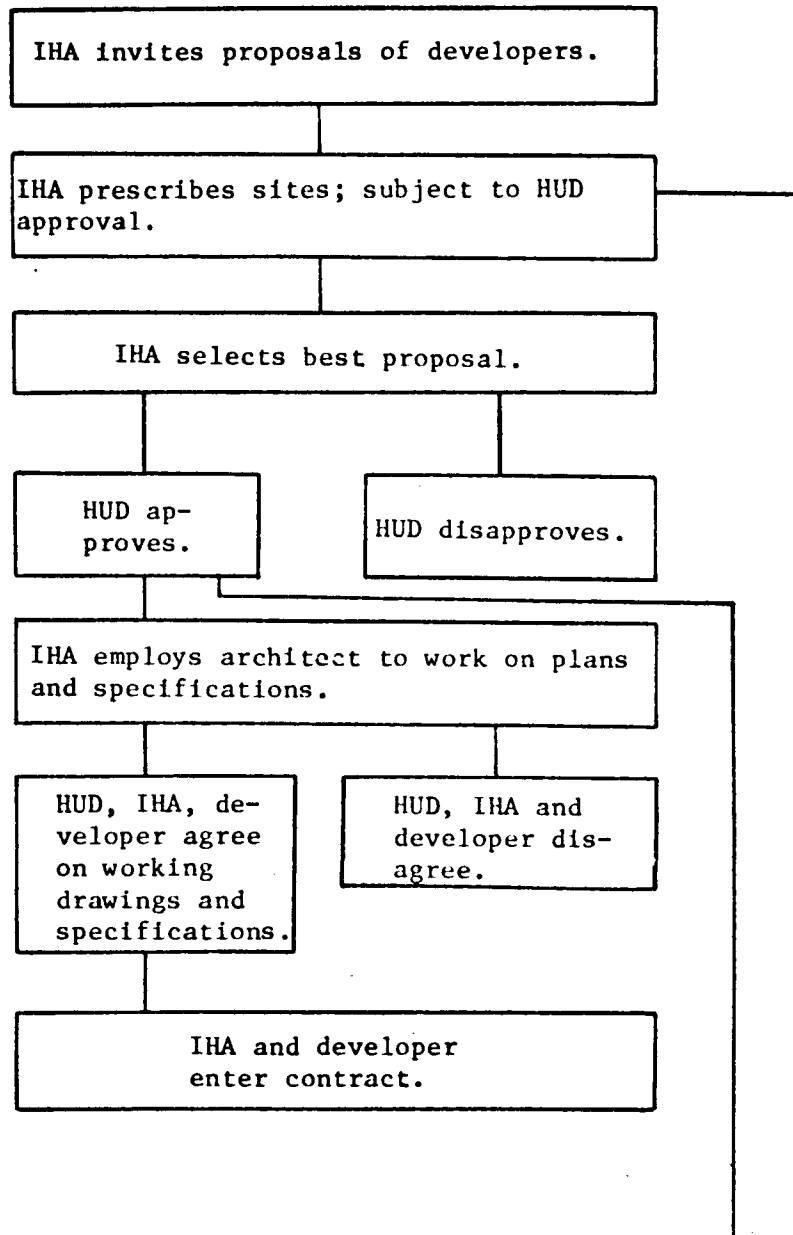


Figure 17a: Initial Approvals Required.

Figure 17: Summary or Imposed House Delivery System for all Indian Tribes.



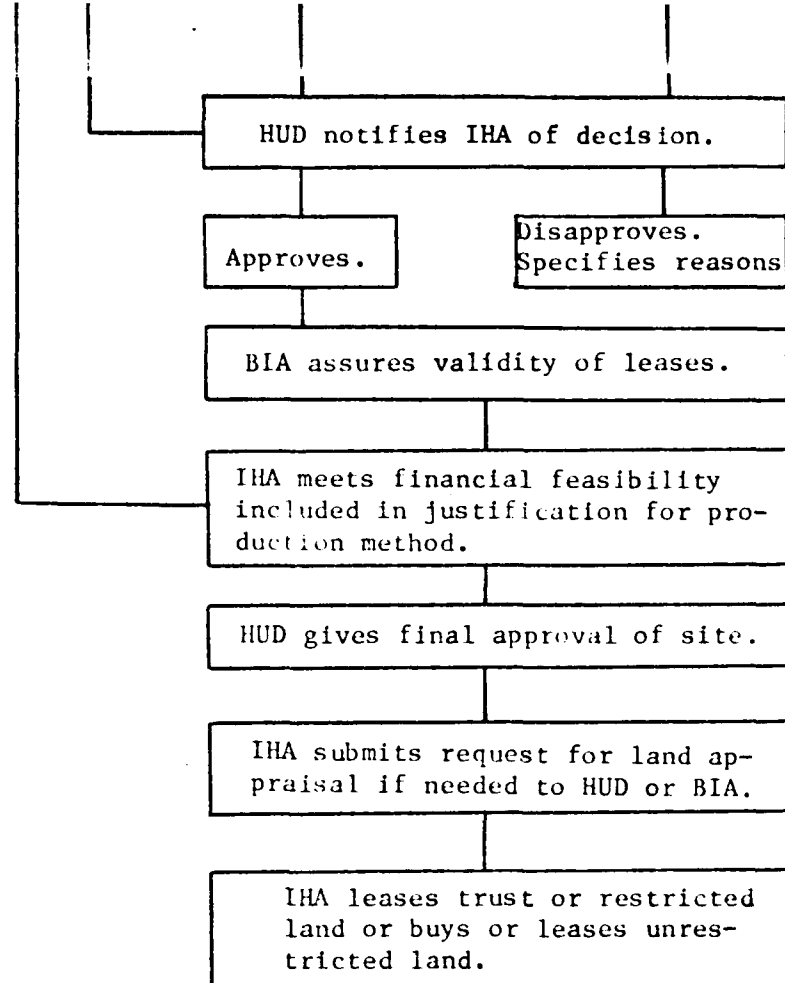
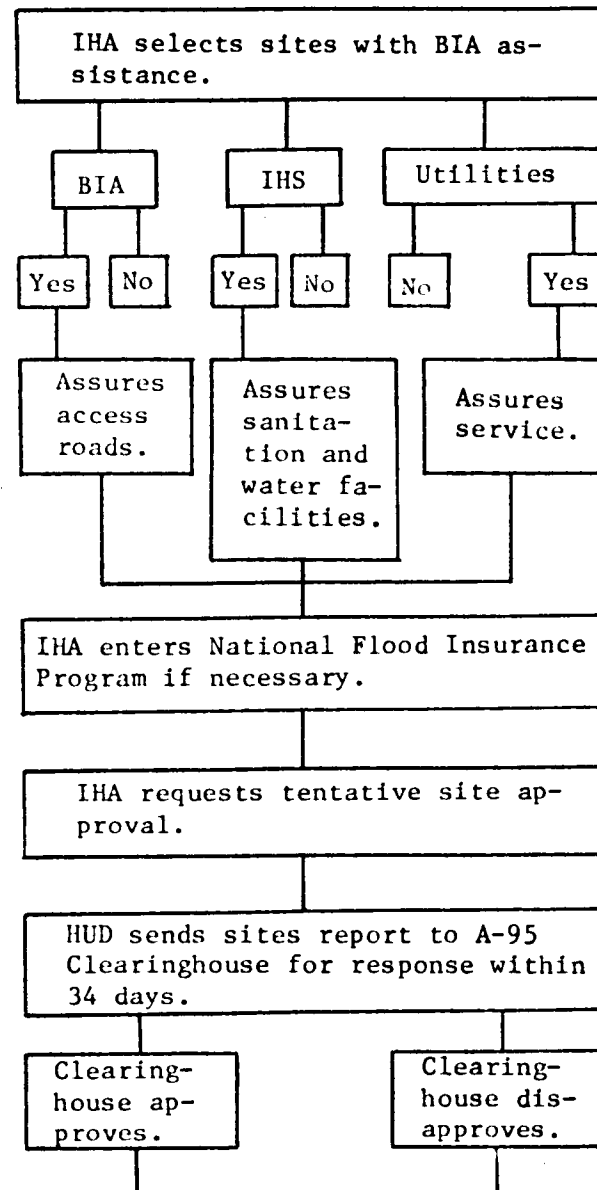
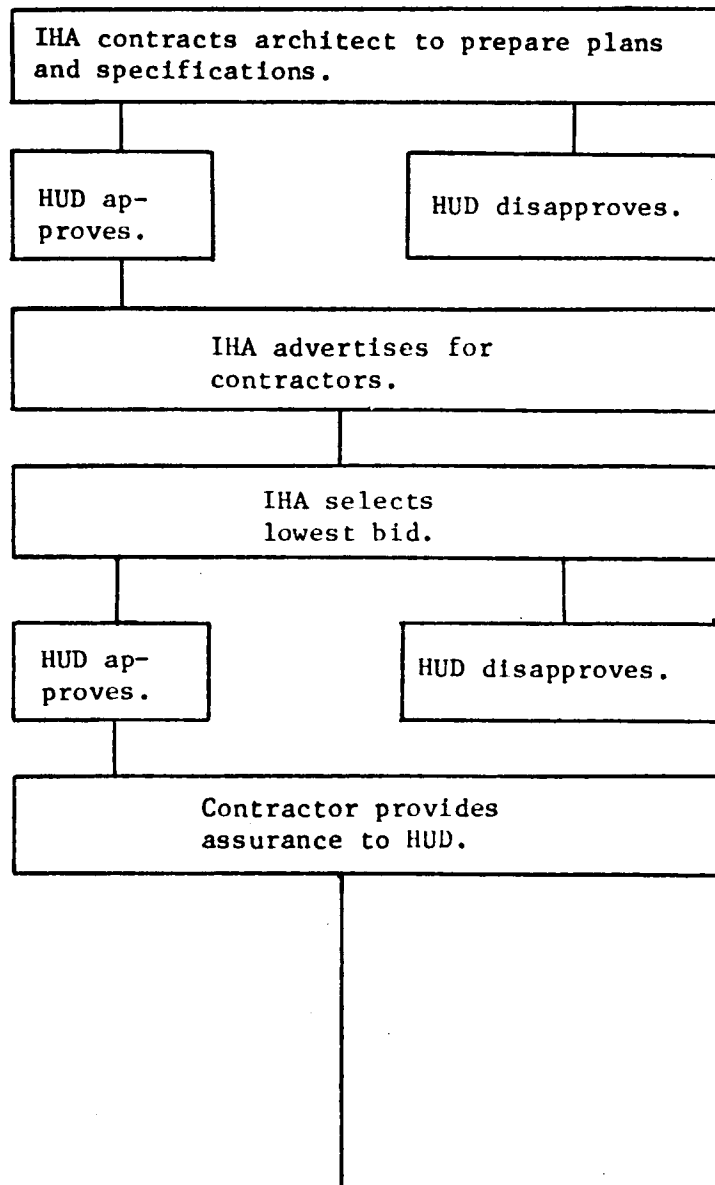


Figure 17b: Turnkey Housing Production Method.

Figure 17: Summary of Imposed House Delivery System
for all Indian Tribes.



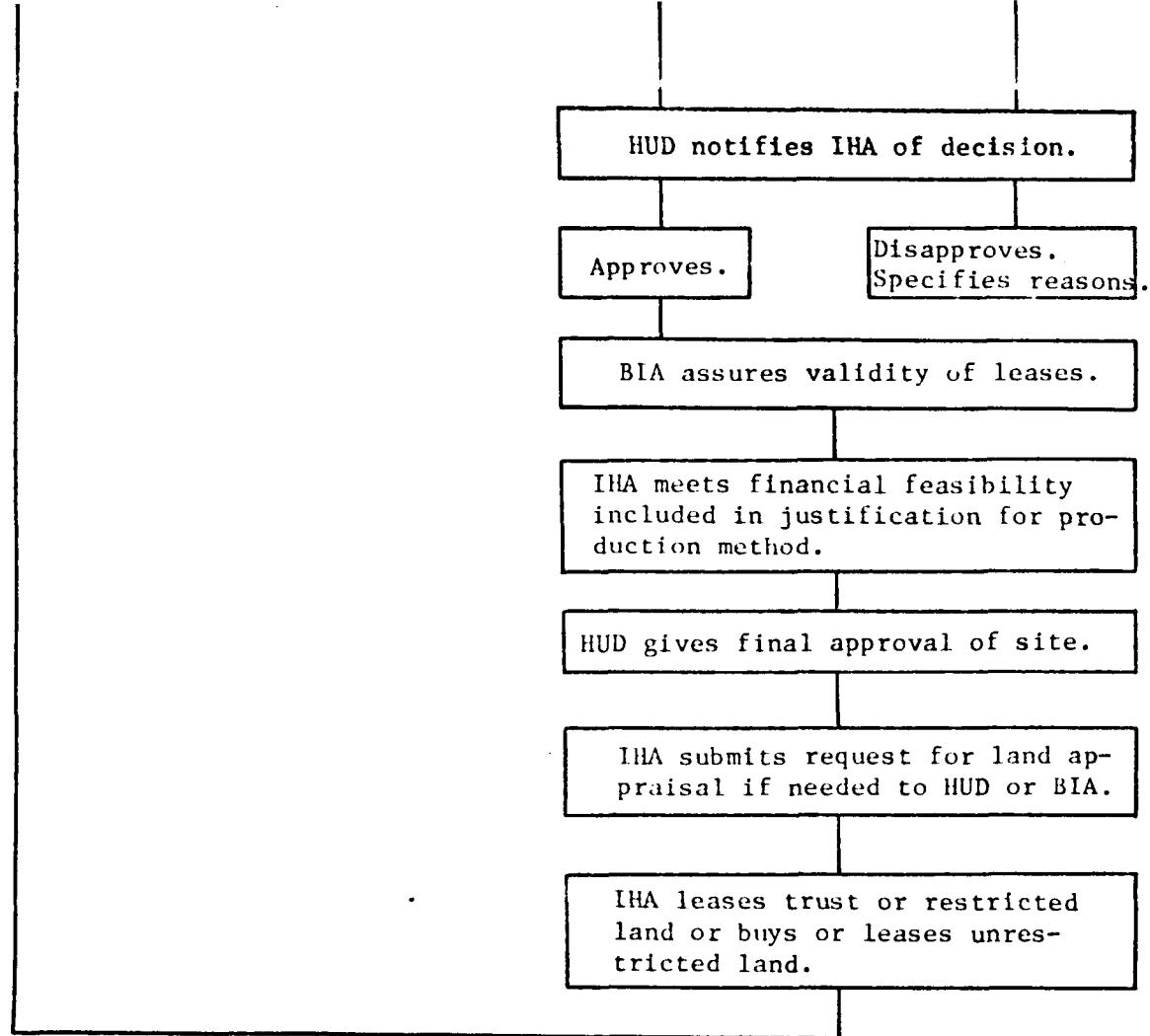
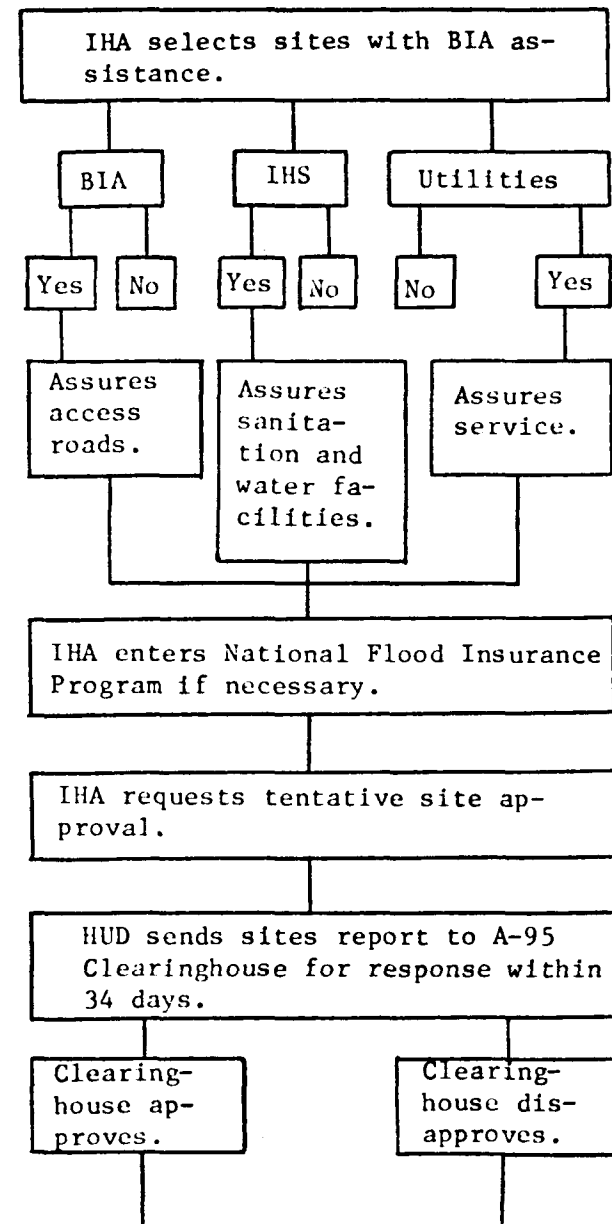
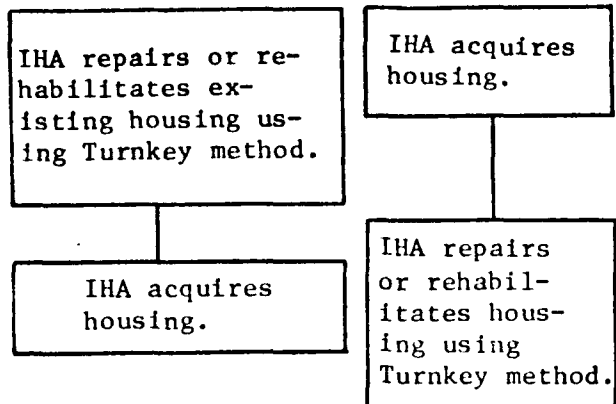
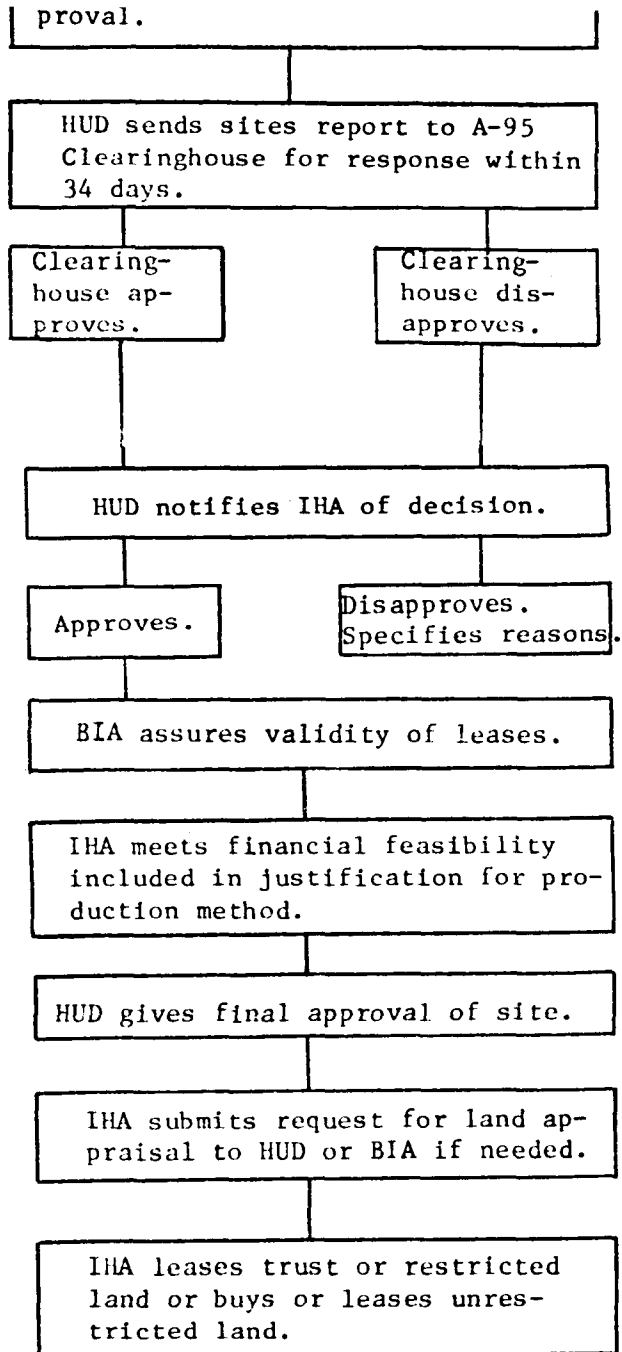


Figure 17c: Conventional Housing Production Method.

Figure 17: Summary of Imposed House Delivery System for all Indian Tribes.





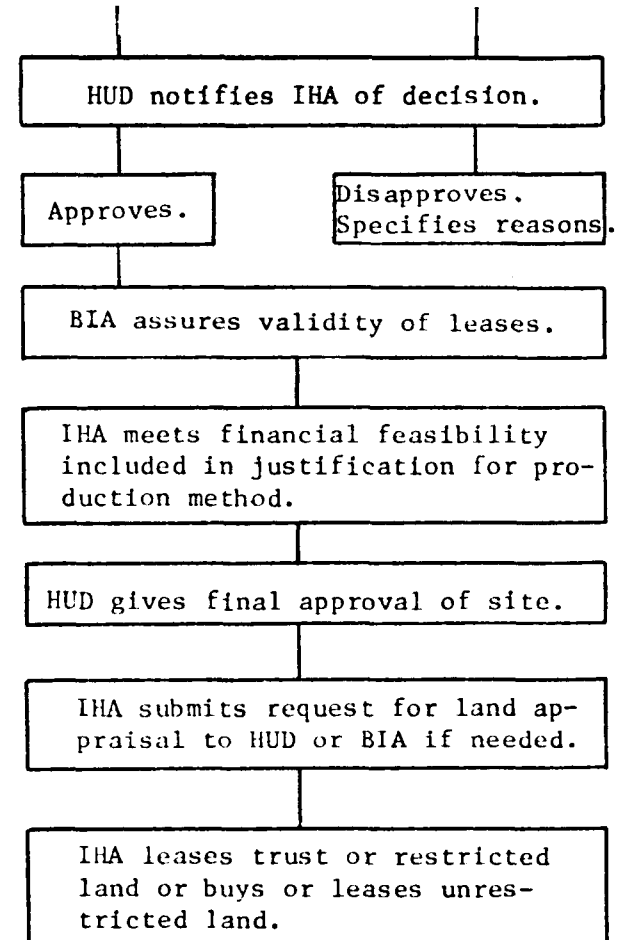
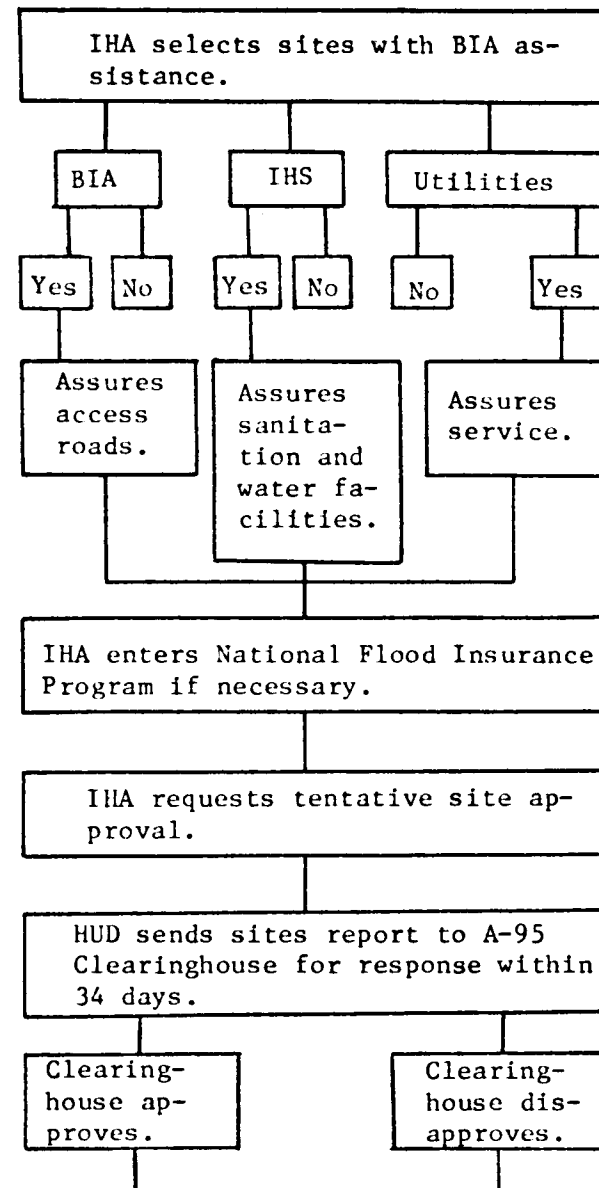
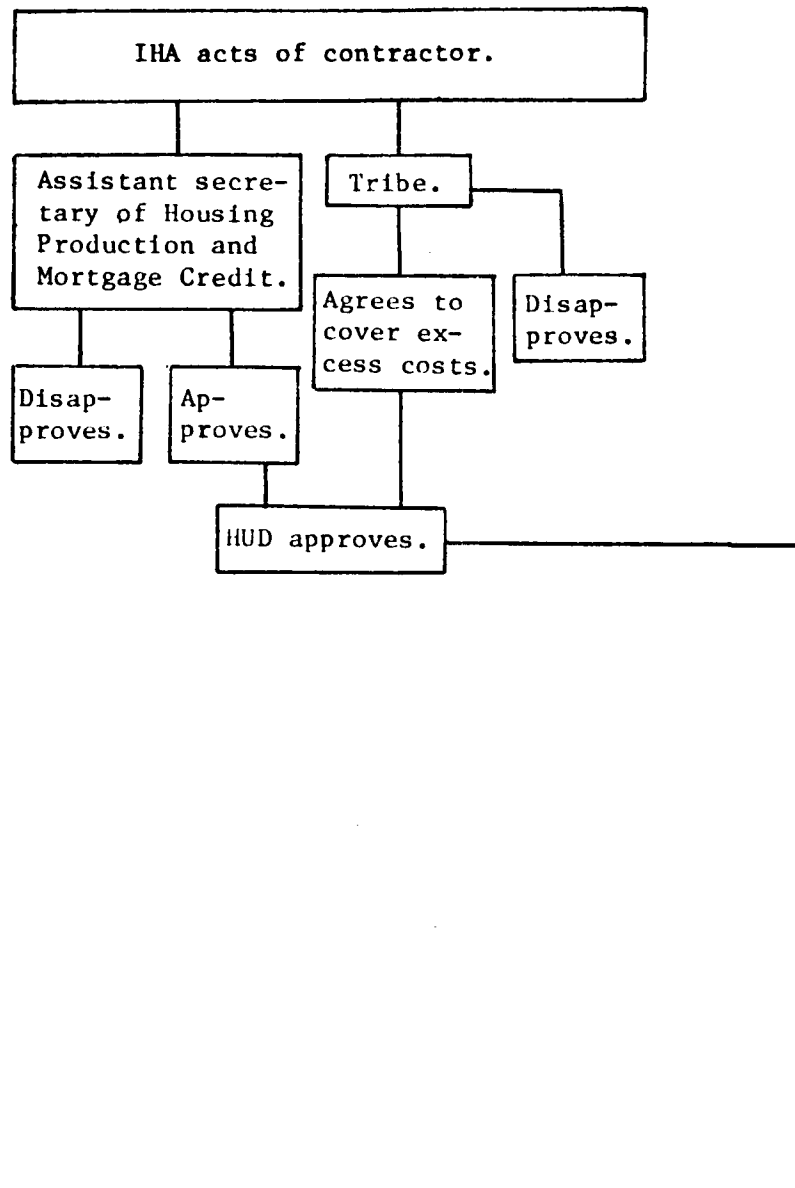
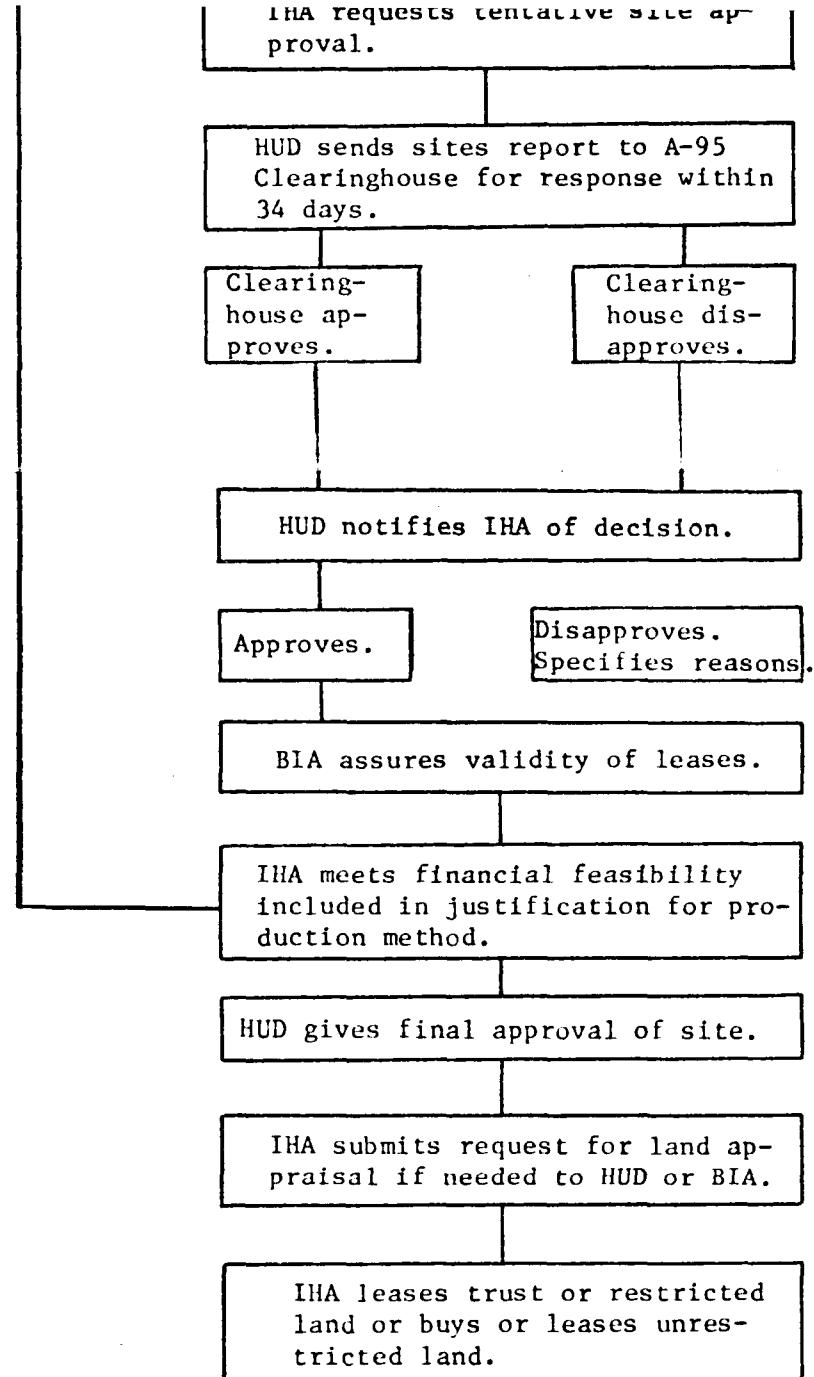


Figure 17d: Acquisition Housing Production Method.

Figure 17: Summary of Imposed House Delivery System
for all Indian Tribes.





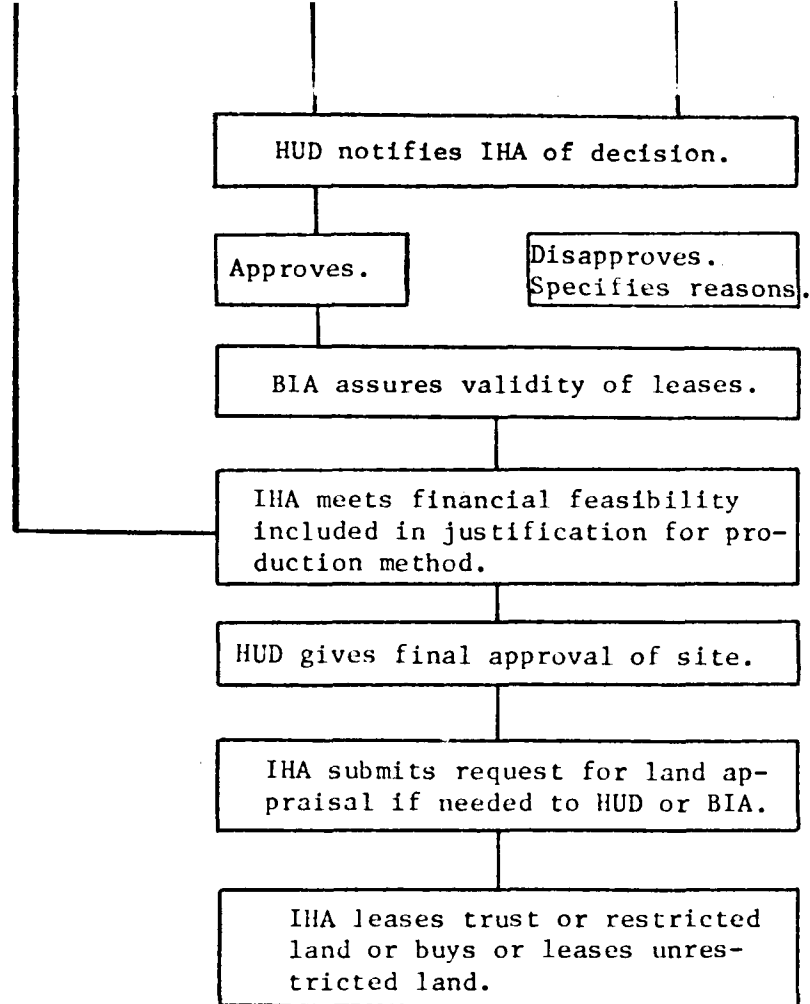
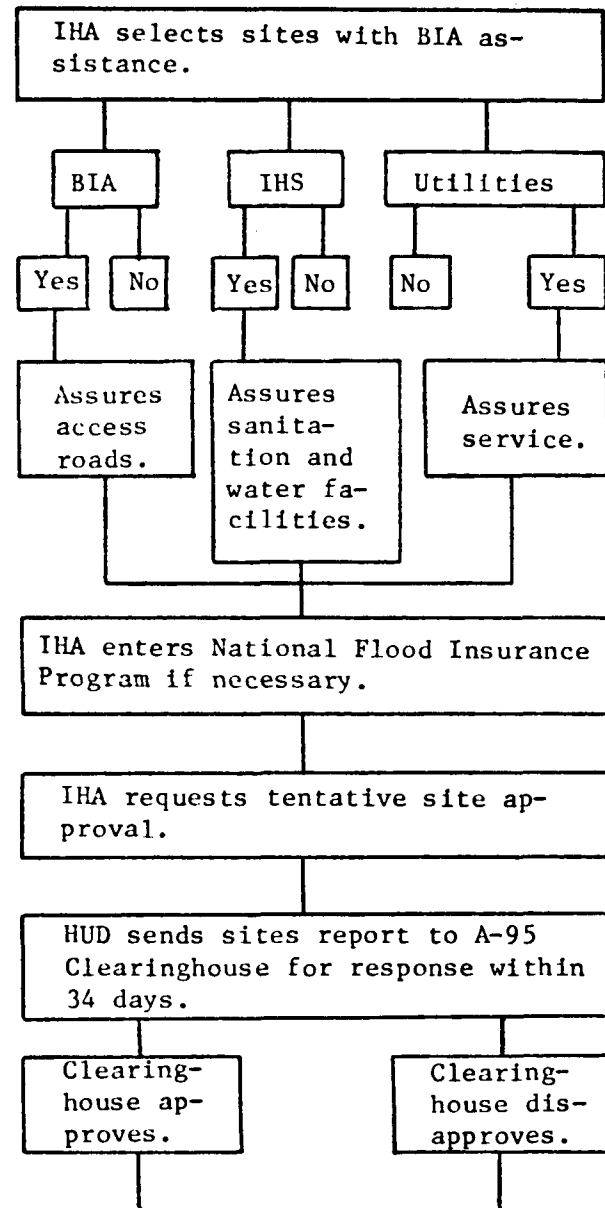
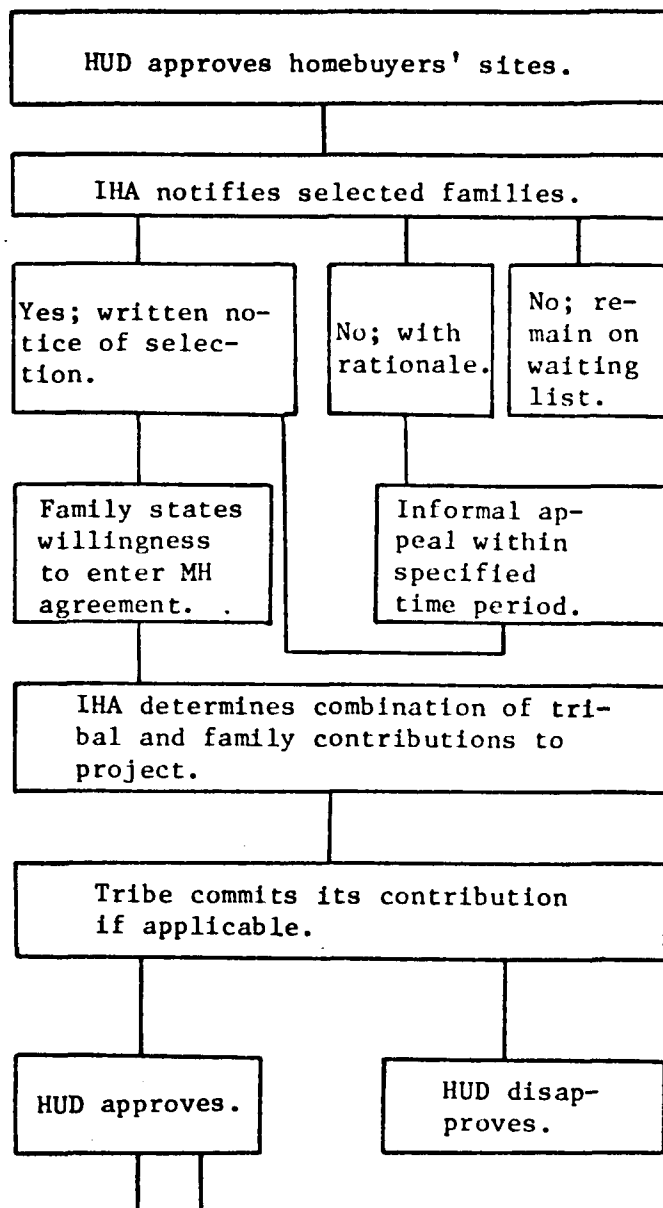
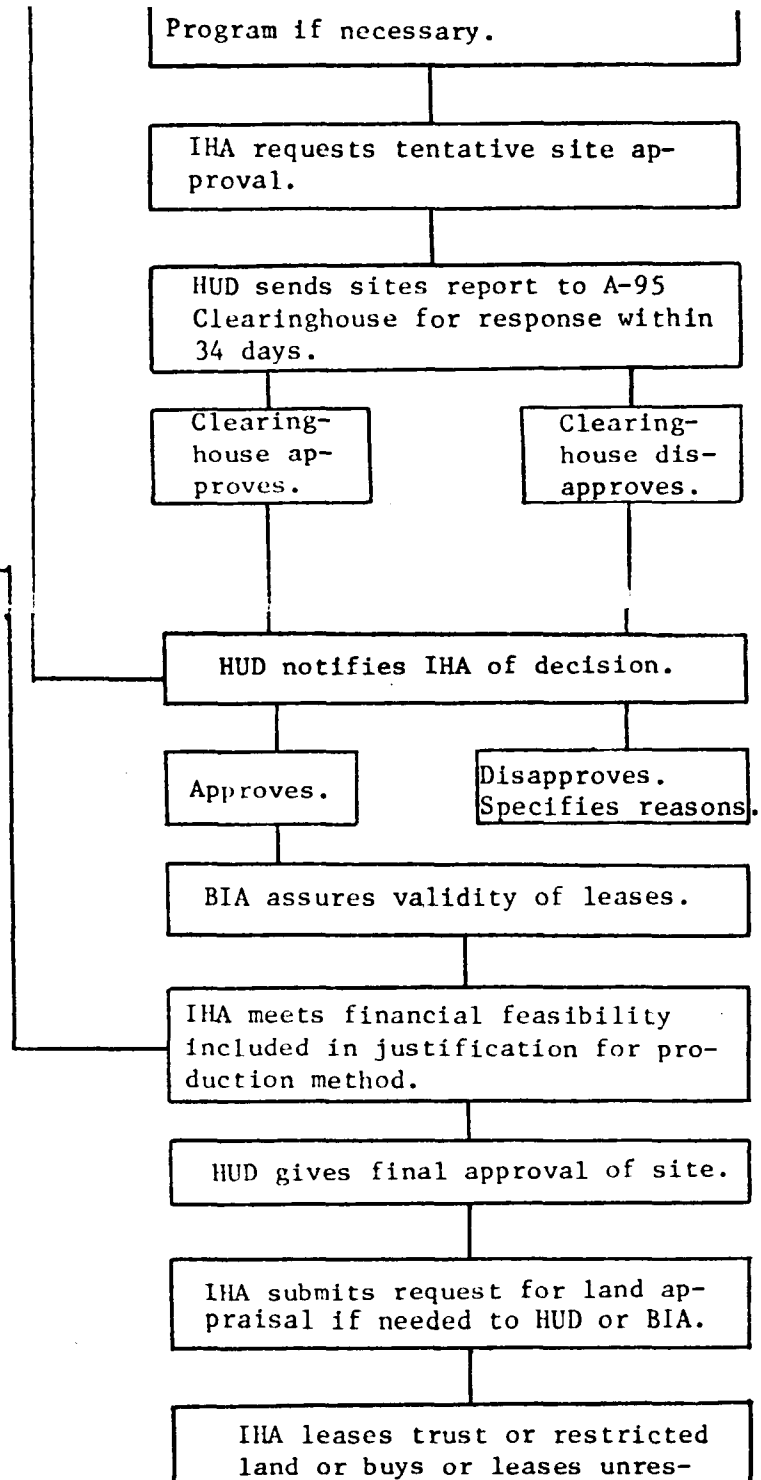
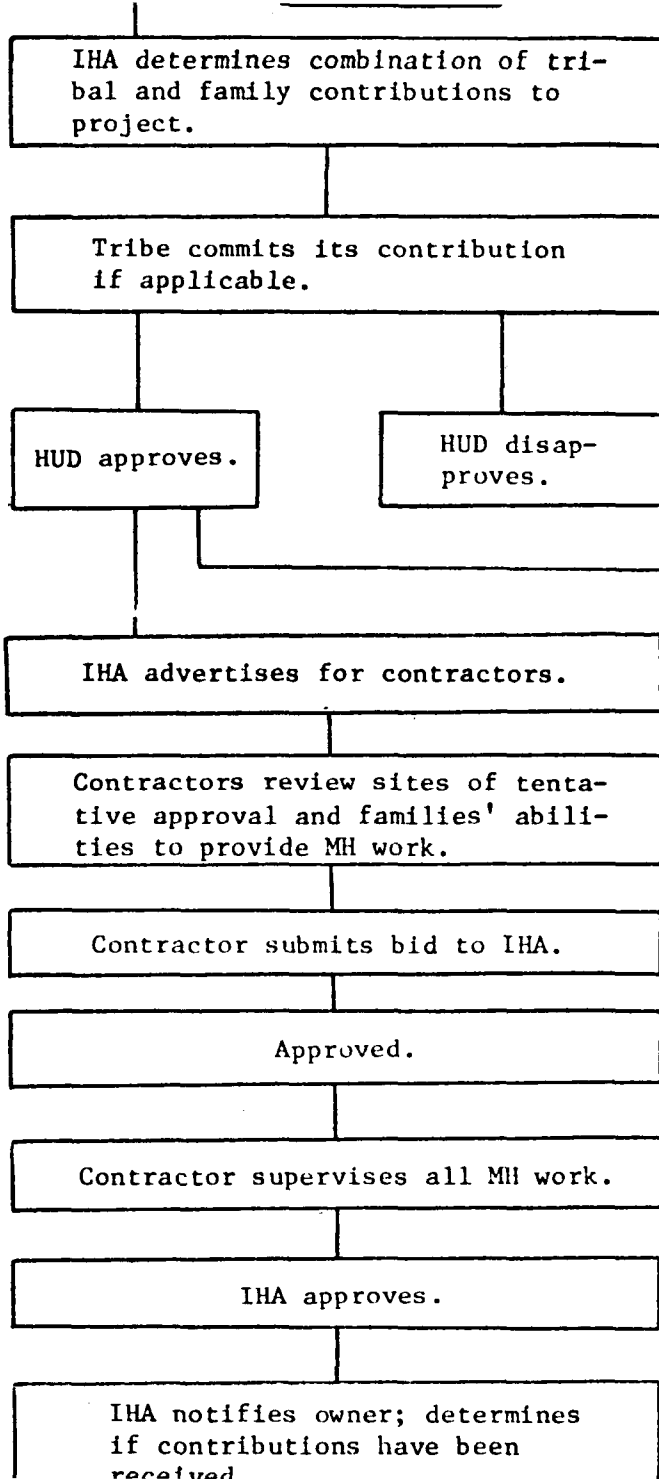


Figure 17e: Force Account Housing Production Method.

Figure 17: Summary of Imposed House Delivery System for all Indian Tribes.





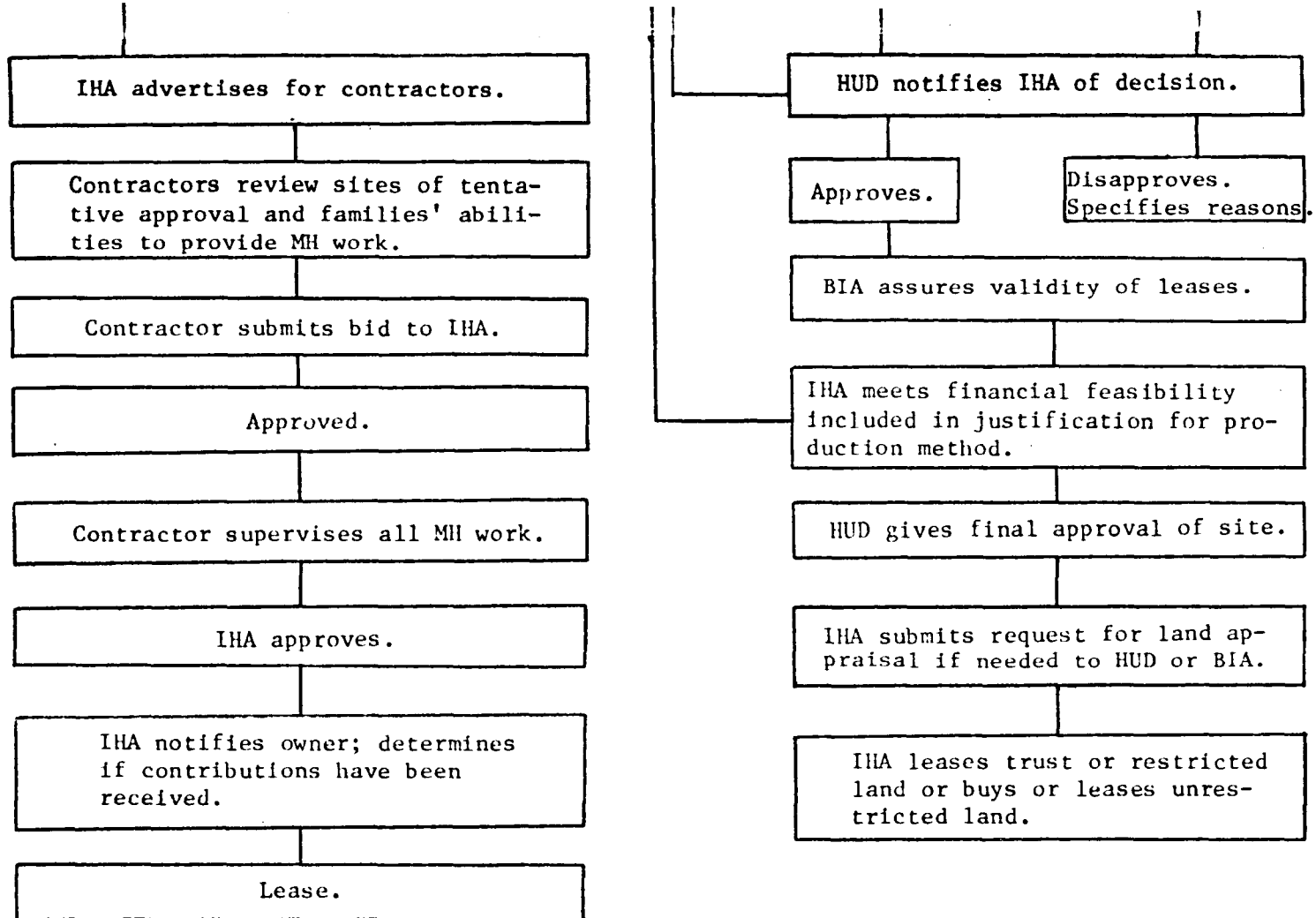
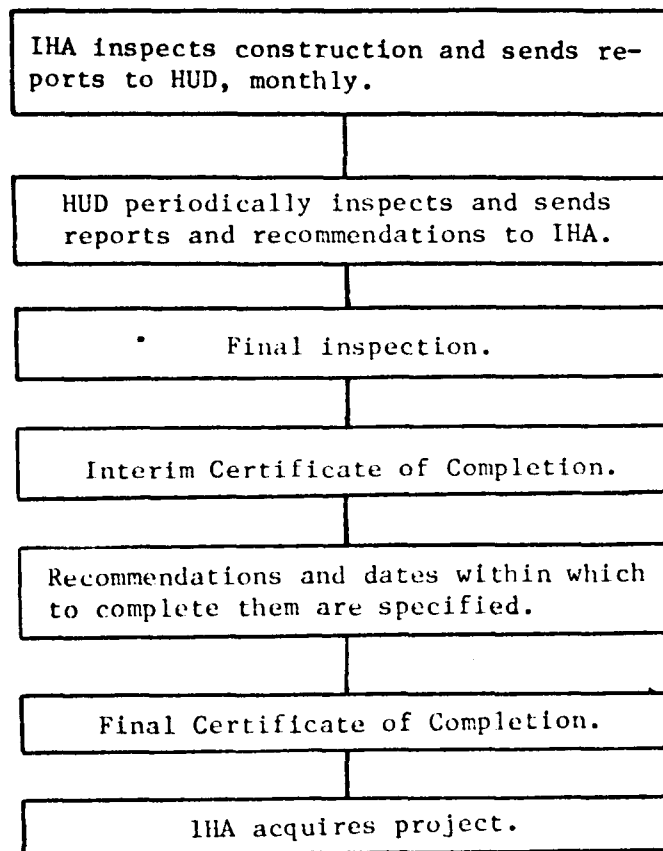


Figure 17f: Mutual Help Housing Production Method.

Figure 17: Summary of Imposed House Delivery System
for all Indian Tribes.



KEY

BIA: Bureau of Indian Affairs.

HUD: Housing and Urban Development.

IHA: Indian Housing Authority.

IHS: Indian Health Service.

MH: Mutual Help Housing Delivery Method.

Figure 17g: Final Approval Required.

Figure 17: Summary of Imposed House Delivery System for all Indian Tribes.

project, the user may own or rent the dwelling. Behaviour of the occupants is legislated with regard to cleanliness and order (HUD, 1976, 805.415/6/7/8). To live in the house, the family must be instructed in the care and use of the house and appliances associated with it (HUD, 1976, 805.429).

As previously stated, these rules and regulations were applicable to all eligible Indian cultures.. But because each culture upon which they impacted was different, the ramifications differed, as will be shown with respect to the Navajo and Zuni. The point which must be emphasized is that this housing policy focused on large groups of environmental elements of Anglo culture, which related explicitly or implicitly to a particular worldview. The adoption of an entire structure would be likely to result in something quite different than that anticipated by the originating culture, largely because of a differing culture base. This would be likely to happen even in the case in acculturated members, though not to the same degree.

The Impact of Imposed Housing
on the Navajo

According to the Committee on Interior and Insular Affairs (1975), the need for housing on Navajoland represented 20% of all Indian housing need in the United States. The number of houses provided by the various sources of assistance (FmHa, VA, HIP and triagency) is shown in Table 9 (p.185). As of March 1975, 101 of the 502 leases on Navajoland were held by FmHa; no homes were built through the VA method. From Table 9

Table 9

Number of Houses Provided
by Various Government Programs
for the Navajo People^a

	Source of Funding				TOTAL
	NHA	FHA/VA FmHA	HIP (New)	HIP Renovated	
Completed as of 31/12/75	1,530	1,216	1,280	6,542	10,568
Under Construction	245	20	0	102	367
Planned 1976-1980	4,000	3,812	500	13,984	22,296

^a From:
BIA Housing Statistics, 31/12/75

(p.185), it can be seen that more houses have been renovated than constructed, although it is not known whether they have been renovated to standard. More houses have been planned for construction in the next four years than have been built since Indian housing became a national issue. It is not surprising since most of the housing stock requires renovation or replacement (Table 10, p.187). However the degree to which the statistics are valid is questionable because the same data from two sources yielded discrepancies (Table 11, p.188). For example, the Navajo Housing Authority (NHA) acknowledged 135 less units under construction in 1975 than the BIA, and collected rent from 66 more units than the BIA stated had been constructed. Although there are fewer Western-style than Navajo-style dwellings, the former are increasing especially in the more urban areas where a suitable infrastructure exists and thus imposed housing delivery constitutes an important trend.

In terms of physical appearance, there was a considerable difference between the female hogan, either traditional or modified, and the imposed house form. Compare: Figure 6 (p. 84); Figure 15 (p.160); Figure 18 (p.189). As stated in Chapter 3, the female hogan was closely related to Navajo epistemology. The premises of Navajo epistemology and their relationship to the imposed house form were examined and little congruence was found on most of the elements forming the basis of comparison. Indeed the quality of the epistemology-environment relationship changed from that of the traditional in several ways. Accordingly, each premise will be examined in terms of this change.

Premise 1: Order. The idea of order seemed well provided in the imposed regulations. The number of specifications and the flow of house

Table 10

Navajo Housing Need Statistics
for 1973 and 1975^a

	Total Housing Units	Standard Housing Units	Substandard Housing Units	Units Needing Renovation	Units Needing Replacement	New Families Needing Housing
1973	23,801	3,126	19,242	13,351	7,324	n/a
1975	23,314	4,753	18,561	12,902	5,659	2,662

^a From:
Committee on Interior and Insular Affairs, 1975; and
BIA Housing Statistics, 31/12/75.

Table 11
Navajo Housing Statistics^a

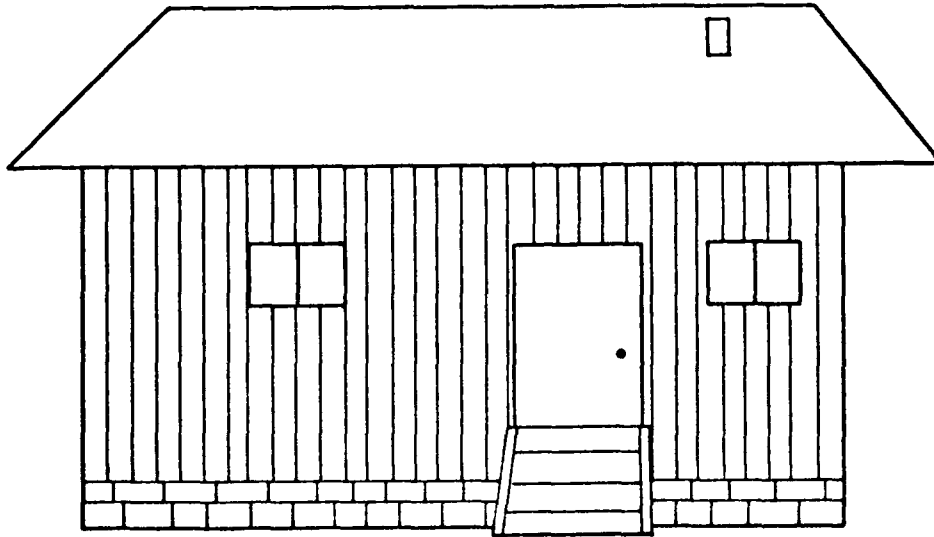
Statistics Source	Low Rent			Mutual Help		
	Constructed	Under Construction	Planned 1976 - 1980	Constructed	Under Construction	Planned 1976 - 1980
BIA	840	70	1,500	690	175	2,500
NHA	860	10	205 ^b	726	100	700 ^c

^a From: BIA Navajo Housing Statistics, 31/12/75
and NHA Housing Statistics, 27/1/76.

^b 85 units requested.

^c 230 units requested.

A. Two - Bedroom House Without Utilities



B. HIP Three - Bedroom House

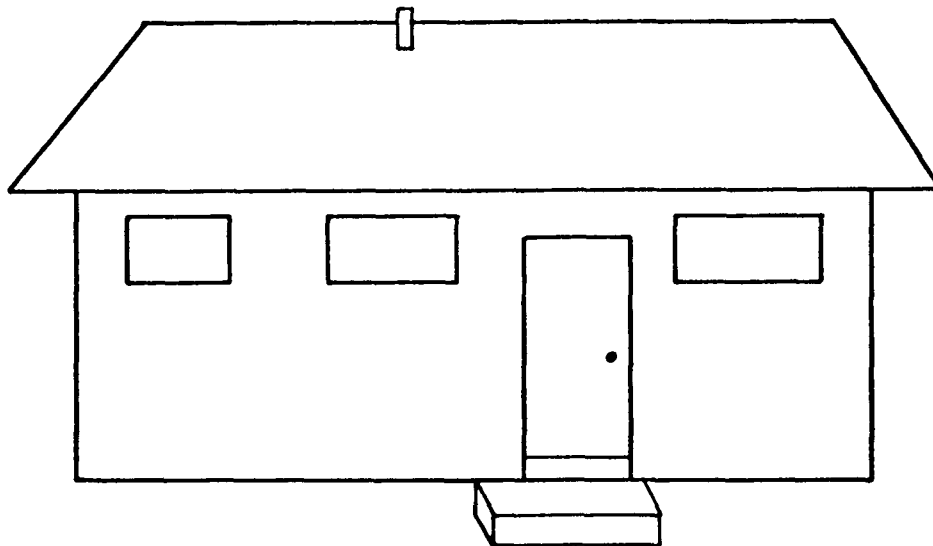


Figure 18 : Government Sponsored Housing

delivery contained explicit statements about: builders, construction processes, administration, ownership, siting, form and use of the built form. However, the nature of this order changed from the traditional order, in terms of purpose and manifestation in form and process. Instead of having as its implicit purpose the provision of some measure of stability, this new order stressed economy and efficiency of process and form. No longer was the focus on escaping the universal chaos in a haven for the human, but rather on remedying the alleged chaotic consequences of unsuitable dwelling forms (unsafety, disease, crimes, immorality, excessive and disproportionate public expenditures) by providing a new, differently ordered form. In fact, the process of housing delivery was exceedingly complex (compare Figure 5, p. 82 and Figure 17, p. 177) and took considerably longer than the traditional means to deliver. Lack of coordination among agencies was evident (Committee on Interior & Insular Affairs, 1975). However, more important is that the message this housing form conveyed according to traditional epistemological interpretation, was a lack of order. In some cases the site was inappropriate. None of the site specifications in the code concerned the traditional respect for nonhuman property rights. By adhering to the code, it was possible to place housing on sacred land as, for example, on the Black Mesa, in direct violation of traditional taboos (Akwesasne Notes, 1976). In this instance considerable controversy has resulted, for some Navajo fear retaliation, such as drought, by deities. It is perceived as a disruption of the universal order and several people refuse to occupy those houses (Akwesasne Notes, 1976 a,b). The placement of houses near one another and the development of apartments were also disconcerting. Such placement precluded the traditional cushion

of space around the dwelling to dissipate evil. The possibility of strangers, i.e. nonkin, as next door neighbours was negatively perceived (Sadalla et al., n.d.). Sadalla et al. (n.d.) reported that the Navajo did not make friends with their neighbours. Instead they spent their weekends travelling hundreds of miles to visit relatives.

The rectangular form of the house and its interior divisions into rooms did not exemplify the traditional sense of place. The traditional placement of persons and objects was dependent upon an eastern orientation, a lack of physical separation of interior space, and a circular form. Although an eastern orientation is possible, it was not specified in the code. And thus it was equally possible to have the main entrance from the north, the most evil direction. Yet a recent study (Sadalla et al., n.d.) indicated that orientation was unimportant to the Navajo. However, this must also be considered in the light of the compartmentalization of house and hogan, whereby separate rules of appropriateness and use are applied.

Thus from a traditional epistemological perspective, the house is differently ordered.

Premise 2: Control. Like its traditional counterpart, control was found to be a major feature of the imposed housing form and process, but the forces to be controlled and the methods and limits of control differed. In the imposed code the prevention of excessive monetary waste, public illness, unsafe conditions and immorality were stressed, as opposed to the traditional emphasis on the control of uncontrollable spirits. In the imposed regulations, nonhuman features, such as elements of the

landscape, were avoided in site selection only when overcoming their limitations was not economically feasible. This implied that the nonhuman could be controlled and overcome, although it might be costly. Another example of the difference in the source of control was shown in the compulsory training program on house use. In this way, behaviours appropriate to Anglo standards of cleanliness were enforced. Traditional patterns of use had been based on mythological precedent.

In terms of housing features, the traditional emphasis on avoiding the uncontrollable was not apparent. An obvious contradiction was site selection, as in the example of the Black Mesa previously mentioned. Moreover, because the form was permanent and built of expensive materials, there was a reluctance to abandon it upon the death of an inhabitant. Adaptive measures, such as taking the dying to the hospital or separating rules of house use from those of the hogan were apparent. In the house, traditionally good features (e.g. circular form) were absent and the presence of several windows (especially if located on the north side) made it vulnerable to invasion.

Premise 3: Oneness. Unification was differently implied in the imposed code compared to the traditional one, in terms of the individual's role, the scale of social and physical oneness, and the physical manifestations in the dwelling form. In the imposed code the builder was a contractor or developer hired by the NHA (although the prospective user might, in the case of a MH dwelling, help to build it under supervision). The owner might or might not have been the user, depending upon the circumstances, and usually the owner was a government agency at least for part of the length of habitation. The user might have been a

different individual from the owner and/or the builder. This contrasted with the integral nature of the traditional construction process in which, as previously elaborated, the builder was the male head of the family, the owner, the female head and the users, the biological family, resulting from the union of the aforesaid male and female. Moreover, there was a difference in the scale on which this social unity was achieved. In terms of the imposed form there was implied homogeneity of Indians (through the Indian Housing Acts), low income Americans (through the Public Housing Act), and every American family which deserves a decent home (BIA, 1975). Levels of unification were at increasingly larger social scales and unification was manifested by homogeneity. In terms of the traditional dwelling, levels of unification not previously elaborated were with all Navajo which possess similar but not identical dwelling forms, and symbolically between female owner and female deities -- a human-nonhuman unity. The Navajo People were a much smaller group than "low income Americans." This was more in keeping with the traditional interpretation of small scale unity manifested primarily through unification of human and nonhuman elements. The difference between imposed and traditional dwellings was further indicated in terms of physical form. Both had considerable physical variation with dwelling type. However, in the imposed form, design was conceived in terms of economy and safety; in the traditional, design was conceived and symbolically manifested in terms of union, especially with the sun, for example in its circular form.

Premise 4: Anthropocentric focus. The premise of anthropocentrism was similarly implied in imposed and traditional codes, for both were designed for human utility -- built, owned and designed by humans. What

differed was scale. The traditional focus was on the individual human and hence on individual dwelling form for small groups. The imposed focus was on Indians as an entity, of whom some individual families required individual and/or congregate housing. Similarly the traditional process involved individuals and small groups of humans, whereas the imposed was regulated by bureaus representative of the American public as a whole.

Premise 5: Nonhuman power. The difference in interpretation of the human-nonhuman relationship also was demonstrated.

There is some evidence that anything stemming from the government was viewed as coming from malevolent forces. For example, Kluckhohn and Leighton (1946) noted an increase in the number of Night Way Sings (chants to counteract evil) against the government, concomitant with increasing affluence among the Navajo. One could speculate that government regulations over housing could be viewed as a power similar to the traditional fear and respect for nonhuman elements. The traditional form was developed as a retreat in terms of nonhuman standards (mythological precedent) as a way in which the human was given permission to live in a dwelling form prescribed for humankind. The imposed form was developed as decent, safe and sanitary in accordance with government standards, as a way of efficiently alleviating a shortage of standard housing. However, that which is decent, safe and sanitary may run counter to traditional mores. For example, consider the installation of running water inside the home. For centuries Navajos had to go to a spring and carry small amounts of water by bucket to the hogan. Water was used sparingly, only by necessity. It was the custom to empty the last drops of coffee or water from a cup

onto the ground, to return it to the earth from whence it came (Newcomb, 1940). It could be interpreted as respect for the nonhuman in using only that which was essential and returning all else, coupled with the fear of retaliation by water spirits should their rights be contravened. With the advent of running water the direct connection between getting water from its source and so returning it, is not made. In fact, the government has plunged pipes into the earth's surface to procure the water. The fact that it has dared to do so may be perceived as evidence of its power against the water spirits. Because the water must be paid for, the government becomes the "middle man" between the nonhuman-god source and the human user. Yet the rules of each were at cross purposes.

The traditional relationship of the dwelling to the nonhuman was paramount, especially symbolically and conceptually. For example, note the numerous symbolic alliances with the sun (e.g. eastern orientation, round form). Indeed, the Navajo conception of the house beautiful was one that conformed to the standards of mythological precedent (Mindeleff, 1895). The assurance that it was fitting was derived in its blessing and the fact that it protected its inhabitants from sickness. Should someone fall ill after inhabiting a new hogan, it was blamed on the hogan not being up to standard (e.g. containing evil). In the imposed form, the assurance that the house is fitting comes from government inspection and the criteria for evaluation have nothing to do with symbolic links with the sun. Although Lockett (1952) remarked that it would have been possible to make hogans to meet the public health requirements, the government refused to do this because the form was perceived as uncivilized. Thus the new dwelling

must meet different standards to be habitable. The compartmentalization of rules of use for house and hogan seems an adaptive solution.

Premise 6: Intimacy with deity. The lack of anything in the imposed housing code relating to an intimacy with deity contrasted with the traditional housing code.

This implied a separation of the house from the sacred. Indeed in mainstream American culture the separate nature of house and church was acknowledged. However, in the hogan no such separation was evident. It was sacred in form, based on mythological precedent, symbolically in allegiance with beneficent forces and, in terms of use, could house ceremonies when necessary. Under many circumstances there was no separation of sacred and secular forms. The hogan reinforced the notion that deities were omnipresent and that the human was closely allied. No such relationship existed in the house.

As important as its sacred nature, was the rootedness of the hogan to the land. Aspects of landforms were deities and it was necessary to be near them to offer prayers (Akwesasne Notes, 1976b). Site prescriptions for housing did not include these considerations. Indeed it was usually inadvisable (and economically unfeasible) to site housing near the landforms the Navajo considered holy (e.g. the grade was too steep), away from the towns and thus the necessary housing-related services.

Premise 7: Close relationship with animals. The weak relationship of this premise was manifested in the imposed code. The dwelling was for humans only and nothing regarding animals was specified.

In terms of the use of the house, there were no regulations against having animals inside, although it is assumed that animals other than pets would not comply with public health regulations. However, since animals were not allowed in traditional dwellings it did not contradict traditional patterns of use, though in this example both were inconsistent with traditional epistemology.

Summary

The consistency between premises and traditional dwelling form was not manifested with its imposed counterpart, except partly in terms of the premise regarding animals. There were qualitative differences in interpretation of premises which were, in the case of the imposed code, inconsistent with traditional epistemology. There was also evidence of adaptation to the house by maintaining separate rules of use for hogans and houses, as well as evidence of complete rejection of house form. Although the number of housing units is increasing, they tend to be placed in towns. Navajoland is geographically disparate and much of the reservation remains scattered and isolated. Those living in the towns tend to maintain their relationship to traditional ways by also having a hogan. "In some ways, the fact that one in three Navajo homes has running electric lights, and only one in five has running water and inside plumbing, can be an indication that the Navajo Way of Life is still alive and well" (Akwesasne Notes, 1976b, p. 22).

The Impact of Imposed Housing on the Zuni

As previously stated, this kind of housing delivery began in the 1960's with the government concern for the provision of decent, safe and

sanitary houses. As of 1973, there were 552 dwellings in Zuniland, 280 of which were new, including 33 mobile homes (BIA, 1973); 550 housing units were required according to the Bureau of Indian Affairs (Table 12, p. 198). Of the five methods of triagency housing delivery (Turnkey, Conventional, Force Account, Acquisition and Mutual Help), the Turnkey method was preferred by the Bureau of Indian Affairs because the houses were used and payments kept up. MH homes were not as successful since there were problems in their completion, resulting in no payment being made and the inability of the housing authority to construct new homes (BIA, 1973). As in Navajoland, imposed housing represents a new and increasing trend.

In terms of physical appearance, there was a difference between the Shalako house, either traditional or modified, and the imposed house form. Compare: Figure 11 (p. 119); Figure 16 (p. 168); Figure 18 (p. 189). As previously stated, the Shalako house was closely related to Zuni epistemology. The premises of Zuni epistemology and their relationship to the imposed house form were examined and changes in the quality of the relationship were found. The qualitative differences between the traditional and imposed relationships will be elaborated.

Premise 1: Oneness. The traditional interpretation was of universal oneness as indicated by an emphasis on the totality of the six Shalako homes within the total ceremonial preparations symbolic of universal unity. The human-nonhuman construction, ownership and use of the dwelling form was also stressed. This contrasted with the kind of unity implied in the imposed code: a unity of Indian and of low income Americans. This is a social unity at increasing levels of the American populace, compared to universal human-nonhuman oneness of the traditional premise.

Table 12
Zuni Housing Need Statistics for 1973^a

Total Housing Units	Total New Units	New Units Required
552	280	550

^a From BIA Zuni Housing Statistics, March 1973.

As previously stated, the traditional and imposed forms had a similar exterior. Inconsistencies arose in interior design. The traditional house was of split-level design, the levels being connected by a walkway and interior windows. Half was for the use of the gods and half for humans; the windows made it possible for all to participate in ceremonies. The divided interior of the imposed house was not designed in this way. It was not possible for the imposed living room to be used as the reception area for the gods because it was physically inappropriate. It was on one level, not allowing a separation of god and human and there were no interior windows to allow spectators to watch the gods dance. Thus, in this house form the gods had no place and the human-nonhuman link was broken. In fact, new houses are not used to host the Shalako because they do not meet these ceremonial requirements.

New houses are detached rather than interconnecting so that all the homes are not physically linked. Thus it is not as easy to allow the house to grow as the extended family expands. A tendency toward the nuclear family has been noted. Because of the topography, houses are situated apart from the main pueblo and thus are not near the Middle Place. When the Shalako come, the people must travel from these homes to the old pueblo site for that is where the ceremonies proceed. Moreover the physical separation also detaches these houses from the kivas. Thus the new houses are set apart from the ceremonial life of the community.

Premise 2: Interdependence. Rather than being a constituent of the Shalako, new houses bore no relationship to it. Instead of requiring the cooperation of the Koyemshi to build them the cooperation of the government was required. Thus imposed houses did not bear any symbolic

relationship to one another, or to the rest of the community. The traditional house was one of six to eight constituent parts which, even together, were only a component of the ceremonial entirety. Under the new code, any number of houses may be built -- having no relationship whatever to the sacred numbers.

Premise 3: Organic Harmony. The new house form was comparatively expensive and designed to be permanent. This precluded the possibility of tearing it down to rebuild or renew it. Becoming expensive it became nonrenewable. One way to maintain renewal could be through interior decoration, spring cleaning and the like. There was an absence of documentation on this subject. Moreover, the building material most amenable to renewal, adobe, was not considered structurally sound for imposed housing (Committee on Interior & Insular Affairs, 1975).

Premise 4: Nonhierarchic order. The premise of nonhierarchic order was contradicted in the imposed code as it was hierarchic. There was a sequence in imposed house delivery, of a complex nature (compare Figure 10, p. 117 and Figure 17, p. 177). Order was manifested in both codes in terms of attention to specifications of construction. However, the purpose of traditional order was the maintenance of universal harmony whereas the purpose of the imposed code was to remedy the unsafe, unsanitary consequences of the traditional dwelling through economy and efficiency.

In the imposed house the design allowed no opportunity for human-nonhuman balance. Adherence to seating arrangement, and thus some form of order, could be maintained in the living room, depending upon placement of a fireplace. However, in the imposed regulations a fireplace was considered a luxury item, and therefore was not available.

Premise 5: Nonhuman focus. The focus of Zuni epistemology on the systemic whole was indicated in the traditional dwelling, in contrast to the human centredness of the imposed form. Although both forms had human builders, users, owners and purposes, the traditional one had nonhuman as well; use and dependence upon nonhumans was indicated. However, the imposed code's emphasis is solely on human use.

As stated previously the house was not designed for nonhuman use. Nothing analogous to the Koyemshi were used; they had no role in construction. Because these homes did not meet ceremonial requirements they were not part of the Shalako. The design assumes the use of indoor plumbing, running water and electricity all of which, to an extent, violate the traditional conservationist behaviour patterns.

Summary

There were several instances of misfit between the house and traditional epistemology.

Impact of Imposed Housing

The term imposed housing has been used with specific reference to dwellings provided by the Indian Housing Act. It is not the only option available to the Navajo or Zuni peoples, but it is one of the most significant because heavy government subsidies make it affordable. The degree of flexibility or choice under this legislation is limited compared to the total number of options available, even if one chooses to remain on the reservation. There are four alternatives: (a) traditional or modified traditional housing; (b) Anglo or modified Anglo housing built by the future owner; (c) mobile homes; (d) hiring a contractor or architect to build to specification.

There were advantages and disadvantages to each. First, Navajo traditional dwelling types were consistent with epistemology, easy and inexpensive to build. Zuni Shalako houses were consistent with epistemology but were very expensive because of the requirements of hosting the Shalako. However there was some indication (Krawetz, field research, 1976; Sadalla et al., n.d.) that more acculturated members preferred Western housing. This preference is further discussed in Chapter 6. Second, owner-built housing allows the flexibility to incorporate traditional elements. However, there was an indication that the requisite skills and experience for such an undertaking were lacking (Kluckhohn & Leighton, 1946; Leighton & Adair, 1963). Also it was time consuming compared to the required effort for a hogan, though it could proceed more quickly than a Shalako house. Contractor built housing was very expensive especially considering the inability to obtain bank loans to construct permanent buildings sited on reservation land. Thus it was an option available only to wealthier persons. Loans were available for mobile homes, however. In addition to this constraint, the preference for mobile homes can be attributed to several factors: youth, economics, changes in familial relationships and length of delivery. Mobile home owners tended to be young and thus were likely to be more acculturated than older persons. They were likely to be employed in wage work and might be unwilling to take the required time off to construct a dwelling. Formerly one could rely on a large group of relatives for assistance in construction but this kind of help was becoming less common. Concurrently there was a growing tendency toward the nuclear type of family, a form compatible with a small, detached house form. However, the mobile homes were usually sited close to relatives suggesting that supportive relationships among family members were still in

existence. Finally purchasing a mobile home was a comparatively fast method of housing delivery and young people preferred not to wait to occupy a dwelling.

Thus various options were available. Some were more expensive than others. Some were more suitable to the more acculturated people.

In both cultures potential areas of fit and misfit between the housing arising from the Indian Housing Act and traditional Navajo and Zuni epistemology were noted. It was originally suggested that misfit was a result of a difference in explicit and implicit assumptions of the cultures concerned, about how the world is ordered and what constitutes an appropriate human-nonhuman relationship.

There were a variety of responses to imposed housing: (a) rejection, as shown in the outright refusal of some Navajo to occupy houses on the Black Mesa because the siting violates sacred land; (b) compartmentalization, as shown in the separation of rules of use and appropriateness for the hogan and the house, and also the secularization of the house; (c) adaptation as in the Navajo use of the hospital for the dying or the painted kiva windows at Zuni; (d) adoption, as in the use of doors, windows and gabled roofs for purposes intended in the originating culture. This last response must be cautiously interpreted because the content in which the element is used, changed. Moreover, there is some indication that adoption is not without consequences as demonstrated by the ridicule of those who dared to innovate at Zuni (Leighton & Adair, 1963). Another example was the fear which Navajo who dared to occupy houses on the Black Mesa expressed about retaliation by deities, which seemed like a passive acceptance of fate. It is possible that behavioural adaptation

could have occurred. Given the physical inflexibility of the imposed built form the Navajo and Zuni could have adapted through changes in behaviour or use of space. However, there was no documentation available on this subject.

Summary

Both studies indicated that there were a variety of responses to the introduction of the material items mentioned, from Anglo-American culture. Moreover, there was the possibility that there were individual differences in response attributable to several factors: individual economic position, cost and accessibility of materials, social pressure, geographical or social isolation, and levels of acculturation. A number of internal contradictions in the relationship of the dwelling to traditional epistemology were noted. These seemed to be the result of attempting to deal with a multiplicity of impacts (social, economic, material) on all components of the cultural fabric, of which epistemology was one part.

CHAPTER 5

RESULTS OF STUDY 4

This chapter deals with the results of the final study. Up to this point aspects of the Navajo and Zuni built environments in relation to cultural epistemology have been dealt with, from an archival view. The focus now shifts to the Zuni culture and its physical environment as it was observed during the summer of 1976. To do this, field and archival methodology was employed to gather necessary data. Thus the purpose of Study 4 was to describe the physical environment of Zuniland and relate it to the epistemological premises of that culture. Although it was not part of the original plan, it was also possible to ascertain some of the attitudes toward present and future development of Zuni, and these will be mentioned briefly.

About a decade ago the Zuni pueblo was a poor Indian community engaged primarily in subsistence agriculture. A small number of people engaged in silversmithing had to move elsewhere to make a living. But then the Anglo American tastes changed toward native American crafts, especially turquoise jewelry, and the Zuni smiths, well-known for their painstaking crafts abilities, were in demand. Traders and tourists increased and it became feasible to stay in Zuniland to earn money. Government jobs and wage work were important sources of income. Money, which began to increase, became more valuable and the things it could buy, televisions and pick-up trucks, were highly prized (Lewis, 1966; Zuni Tribal Historian, personal communication, 1976). Residents in Gallup remarked that the Zuni people, normally polite but reserved, were opening out to the world and becoming "downright friendly." Zuni was obviously changing. It was in this context that we drove to Zuni for the first time.

We entered Zuniland on Highway 53 greeted by a sign "Welcome to Zuniland" (Figure 19, p. 208). On our right we passed the site for the shopping centre, to be complete with movie theatre, laundromat, clothing stores, on the left was the sacred mountain, Dowa Yalenne, to which the Zuni fled in times of crisis. Interspersed between stretches of brush were mobile homes, a few stone structures, some take-out stands and gasoline stations, and suddenly we were in the centre of town. Further west of Pat's Chili Parlor was the old pueblo and to the north, the Zuni Tribal Headquarters, a narrow buff coloured building with a portico supported by straight beams, a gabled roof -- on one end a large sign for the First State Bank of Zuni and on the other, nearest the post office, the Zuni Learning Centre. With a slight move of the head we saw "Zuni old" and "Zuni new," both of which comprise modern Zuni.

In the summer of 1976, the Tribal Headquarters was central. Within it were many of the major government offices (both Zuni and U.S.) and the bank. Nearby were the post office, Pat's Chili Parlor, Zuni Restaurant, the old pueblo, and several trading stores (both wholesale and retail) including a general trading post. The parking lot in front of the Tribal Headquarters was large enough to accommodate the tourists' cars as well as those of the local populace. This area appeared to be the new town centre.

The rest of the area is not so easily described for it consisted of a variety of land uses and building types spread among vacant areas in seeming disarray. It was not the stereotypic vision of a neat American town with grid patterned streets and well-defined areas. Instead it was a mixture of "this'n that, here'n there" -- an unselfconscious reflection

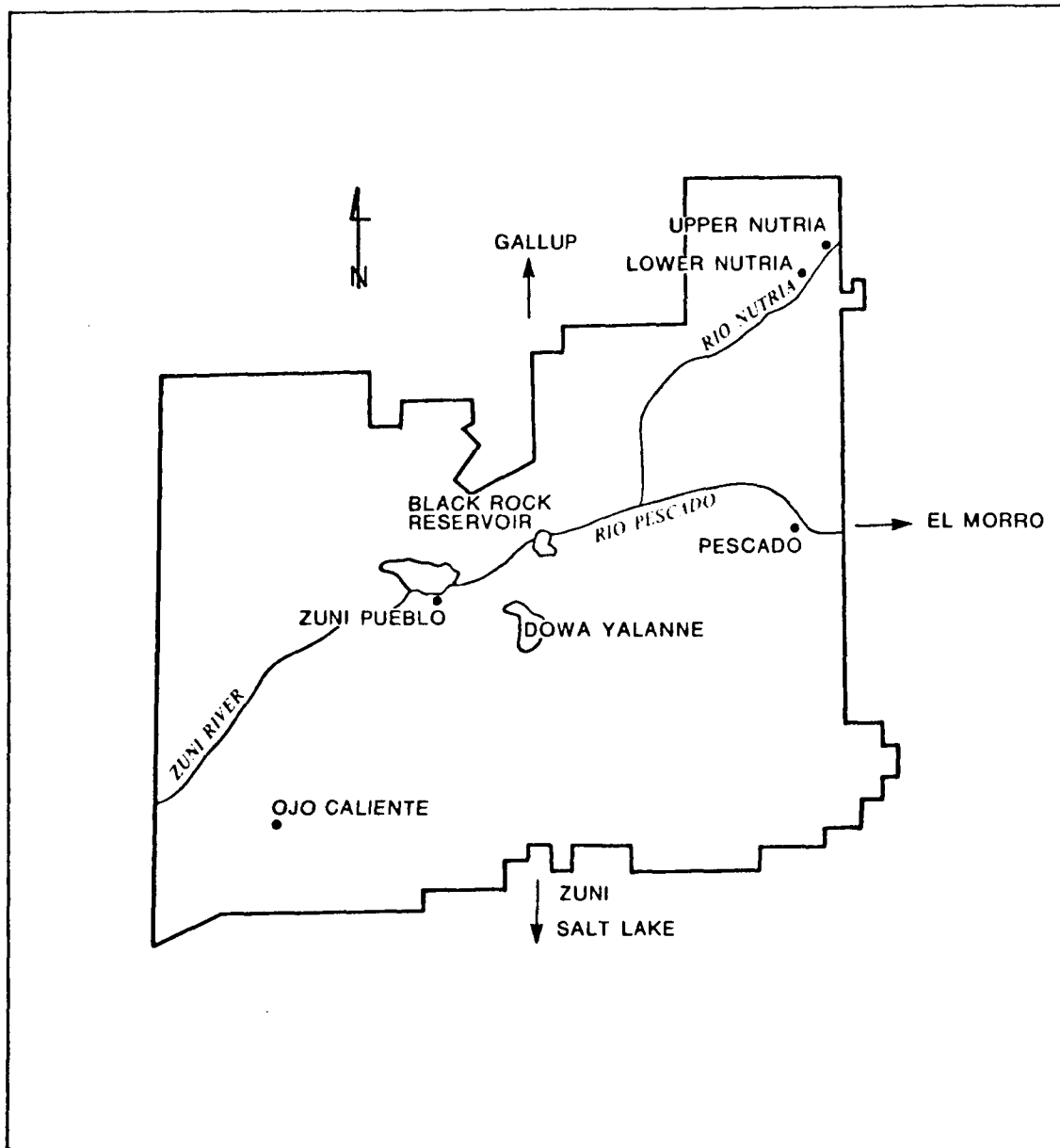


Figure 19 : Zuniland (not to scale)

of growth and change rather than the manifestation of a regional land use plan. Yet for the purposes of description it is easier to divide the area into land uses and describe each of them, even though well articulated land use areas are convenient descriptors that may convey an impression of greater order than in fact existed. The seven land uses found were: (a) historic, (b) public and semi-public, (c) commercial, (d) residential, (e) industrial, (f) agricultural and (g) open space.

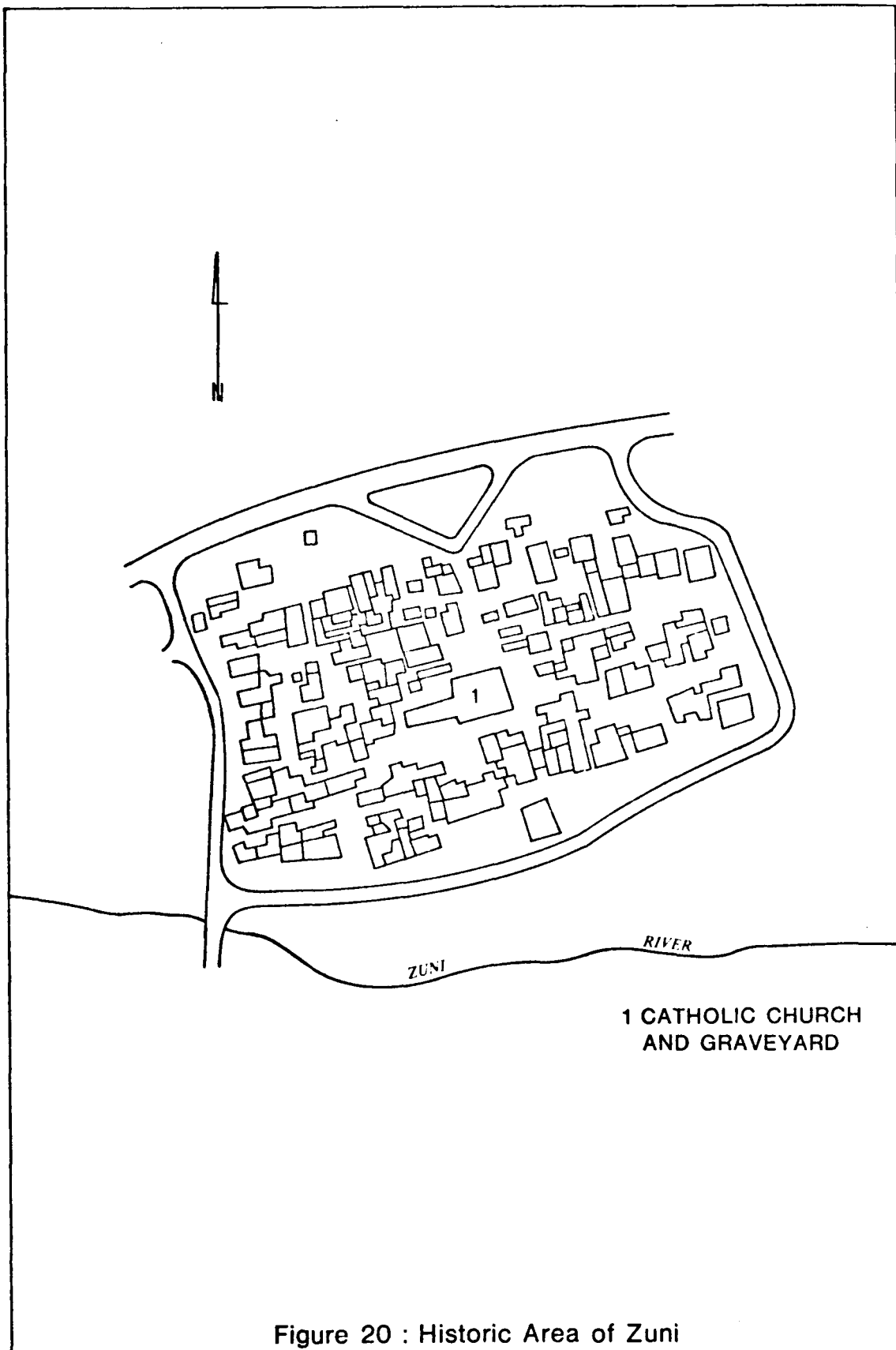
Because the historic area was the focus of previous description in the base time period (Chapter 3), it will be described in detail. Other land use areas will be considered more briefly.

Land Use Areas in Zuni

The Historic Area

The Zuni historic area of 1917 was a community consisting primarily of six kivas and interconnected dwelling units centred around the Roman Catholic Church (see Figure 14, p. 139). When a new map of the area was prepared from observations in this study and compared to that of 1917, it was apparent that the general configuration was relatively unchanged. (See Figure 14, p. 139 and Figure 20, p. 210). However, changes in settlement features were evident, based on a building-to-building survey in which an inventory of physical features was made.

The old town wall was in disrepair, in many places non-existent, except for areas along its southern border that had been replaced by cinder block. This boundary seemed to be replaced by paved roads enclosing the area. There were no internal roadways although trucks had marked various paths in the sand whose layers were so thick that on a windy day we were hit by flying sand pellets. Cars and pick-up trucks



were parked near dwellings and there were evidences of other Anglo amenities such as electricity, gas, newspapers and television, which had no archival counterpart. The contours of the land were visible and the preference of building new homes upon old ones remained. At most buildings in the area were two stories high.

The six kivas remained virtually in the same positions as in the archival period, still distinguished by the presence of ladders peering up from their roofs. They had windows which were boarded up or painted over so that passersby could not look in, and they had doors as well (unlike their archival counterparts).

The primary built form remained the dwelling unit linked with others to form interconnected blocks of adobe, stone and cinder block. Outside the homes were newspaper boxes for the Gallup Independent, stored items, garbage cans and the traditional ovens for baking bread. Over 80% of the oldest homes had glass windows and western-style doors and about 19% had pitched roofs. Shalako houses were distinguished by the presence of a dated stone, of which two were particularly elaborate. One had a drawing of the Longhorn (rain priest), another of a bear and sun. In a few cases, family names were marked, an observation not previously documented. Other than the dates, it was difficult to discern the relative age of buildings.

New to the area were two commercial establishments both part of or inside dwellings, Homer's stand and Mary's stand, where one could purchase snacks.

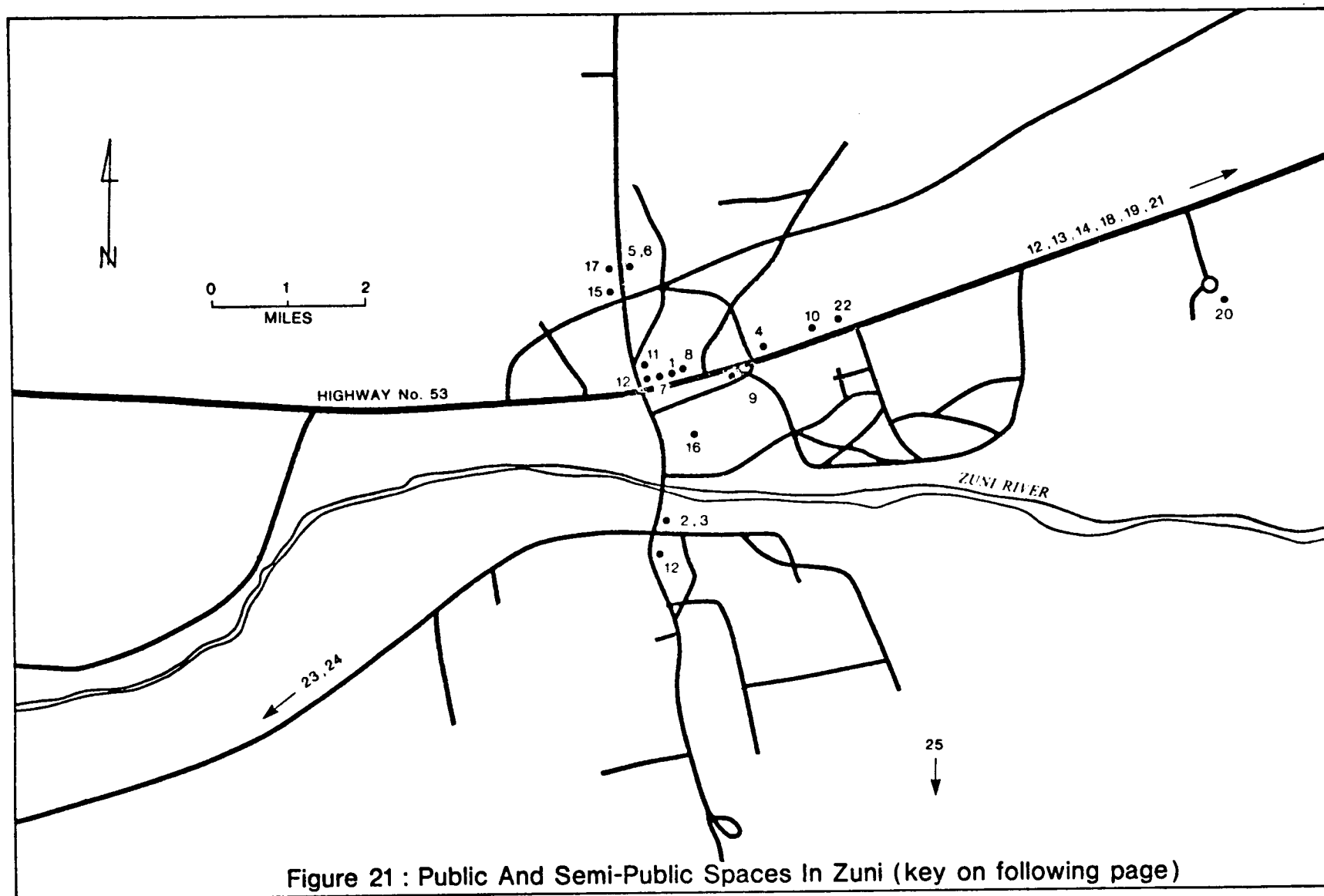
The Catholic Church remained in the centre with a fenced-in graveyard at its front door. It was built originally at the time of Spanish

rule as a mission to the Zuni and was subsequently destroyed during the Pueblo Rebellion of 1685. Cushing (1896) had tried to convince the Zuni to restore it only to be told that the church was dead and could not be revived. As was previously elaborated, the church eventually became the new town centre (Kroeber, 1917). In 1967, the building was restored as a major tourist attraction using funds from the Zuni, the Catholic Church and the National Park Service. The Zuni have been transforming it in the process, with murals of the Kachina and Shalako on its interior walls.

In a way, the more the historic area had changed, the more it remained the same. Kroeber (1917), for example, had noted that while the general configuration had remained the same since Mindeleff's (1895) survey, the walls had shifted a few feet because of renovation and construction of houses for the Shalako. Similarly, in 1976 it was found that the general configuration was much like that reported by Kroeber (1917), though the settlement had changed in detail. This was not the case for the other areas of the town.

Public and Semi-public Spaces

The majority of examples of this kind of land use was devoted to government buildings of which the major complex was the Zuni Tribal Headquarters. This included a variety of Zuni and U.S. offices in addition to a community learning centre which provided a library and various educational activities such as tutoring. Other buildings included a hospital (with over 40 beds), four schools (three elementary and one secondary), six kivas and three churches (Baptist, Christian Reformed and Roman Catholic). A list of these buildings and their location are shown in Figure 21 (p. 213).



Key to Figure 21

1. Tribal Headquarters: BIA Programs
 - Census Office
 - Community Health Representative
 - Consumer Education & Advocacy
 - Division of Education
 - Economic Development
 - Employment Assistance
 - Engineering
 - Housing Improvement Program
 - Learning Center
 - Library
 - Mental Health Program
 - Natural Resources Development
 - Neighborhood Youth Corp
 - Otitis Media Program
 - Real Estate
 - Roads Construction
 - Safety Office
 - School Cultural Project
 - Social Services
 - State Extension
 - Tribal Council
 - Utility Authority
 - Veterans' Service

Churches

2. Christian Reformed Mission
4. Baptist Church
15. St. Anthony Mission
16. Nuestra Senora de Guadalupe de Zuni (Roman Catholic Church now historical monument)

Note also six kivas shown in Figures 13 & 14.

Educational Facilities

1. Learning Center
 - Library
 - Division of Education
 - School Cultural Project
2. Christian Reformed School
3. Dowa Yalanne Elementary School
5. Follow Through Program
6. Zuni Elementary School
 - Language Development/Education Program
11. Head Start
17. St. Anthony Zuni Indian School
20. Zuni High School

Health Facilities

1. Community Health Representative
Mental Health Program
Otitis Media Program
6. Maternal Child Health
13. Dental Clinic
Field Health Station
14. Indian Hospital

Legal Facilities

1. Safety Office
9. Legal Aid
11. Police
Probation & Parole
Tribal Court

Other Facilities

7. First State Bank of Zuni
8. Post Office
10. Manpower
11. Game & Fish Program
Daycare
12. Fire Stations
18. Zuni Air Corporation
19. Zuni Conservation Enterprise
21. Zuni Rentals
22. Archeological Conservation Office
23. Housing Authority
24. Zuni Building Company
25. Zuni Salt Lake

Commercial Spaces

The major commercial area was located along Highway 53 (Figure 22, p. 217) but it did not form a concentrated, homogeneous area, for several commercial facilities were spread out in other parts of the community and Highway 53 was dotted with residences and open space areas as well. Commercial facilities included restaurants, a post office, a few franchise take-out stands and stores of several types (a trading post equivalent to a small town general store, a furniture store filled with Western-style furniture, crafts stores for tourists, and turquoise outlets), a branch of the First State Bank and several gasoline stations. Proposed commercial facilities included a shopping centre. A list of these facilities and their location are shown in Figure 22 (p.217).

Residential Areas

Aside from the historic area, there were five residential areas (Chambers & Campbell, 1966) consisting of detached dwellings, usually of HUD approved design. Only one house of modern pueblo style was found and it was outside the historic area. Along the major roadways were older houses of more traditional styles, as well as mobile homes. New residential areas resembled contained suburbs, consisting solely of dwellings. The location of residential areas is shown in Figure 23 (p. 219).

Industrial Spaces

Little of an industrial nature was found with the exception of an airport designed to serve the Zuni community (Figure 23, p.219). It provided charter and air taxi service on a small scale.

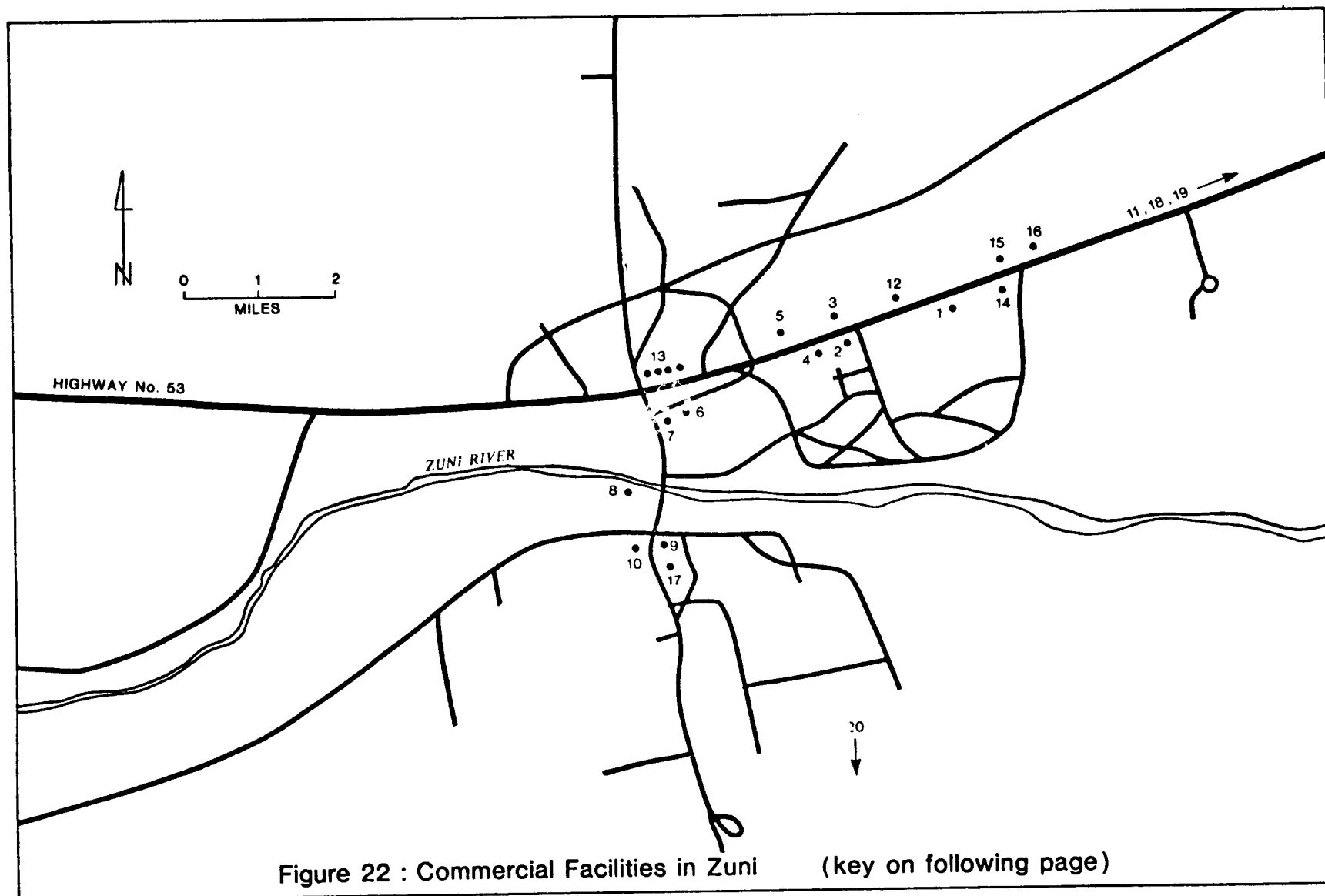


Figure 22 : Commercial Facilities in Zuni (key on following page)

Key to Figure 22

1. Craftsmen Cooperative Association
2. Pat's Chili Parlor
3. Zuni Restaurant
4. Zuni Trading Post
5. Hawikuh 7-11

6. Mary's Stand
7. Homer's Stand
8. Zuni Home Furnishings
9. Halona Plaza
10. Zuni Launderette

11. Site of Future Plaza
12. Vanderwagon Arts & Crafts
13. Various wholesale and retail traders
14. Eat & Go Drive-In
15. Lionel Texaco Station

16. Malco Gas Station
17. Zuni Pottery Project
18. Zuni Candle Company
19. Tribal Fairgrounds
20. Zuni Salt Lake

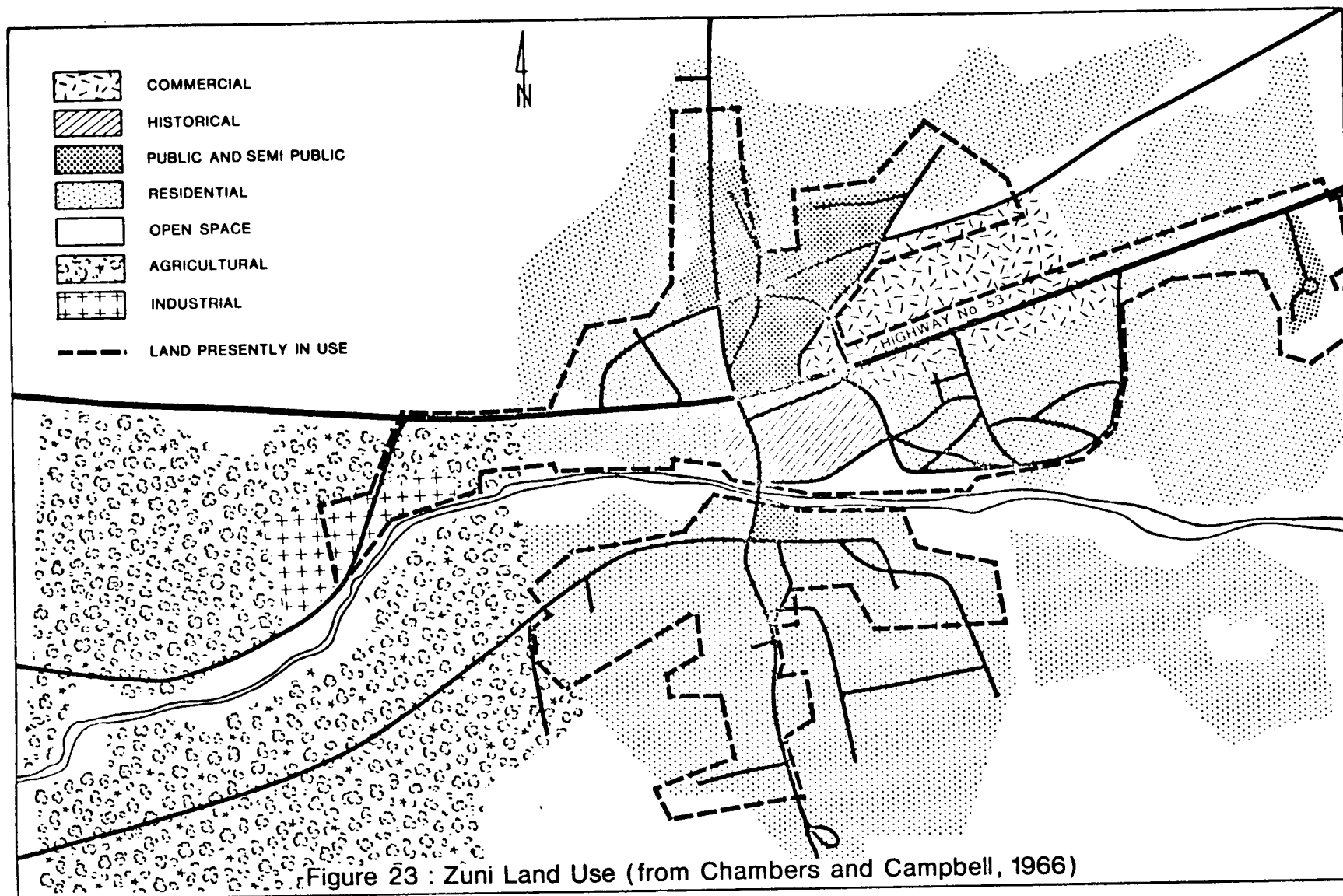


Figure 23 : Zuni Land Use (from Chambers and Campbell, 1966)

Agricultural Spaces

Agricultural land was located far from the town in Pescado, Ojo Caliente and Nutria (Figure 19, p. 208). All buildings in these towns were traditional and the area had not physically changed since the base time period, according to consultants (Figure 23, p. 219). However, patterns of use had changed. "Today, to the south, the orchards have long since been laid waste, and to the west, there still stand a few fruit trees, cared for by the old men who live at their orchards year round" (Zuni People, 1972, p. 16).

Open Spaces

Parks are part of the official plan (Chambers & Campbell, 1966) but in the summer of 1976, open spaces consisted mainly of vacant areas, the tribal fair grounds and camping sites for tourists (Figure 23, p. 219).

Summary

In summary regarding the several land uses, agricultural and open space areas were relatively unchanged (since the archival period) and although some of the physical features of the historic area changed, its general configuration was remarkably similar to that of 1917. The increasing number of land uses was concomitant with changes in economic base from one that was primarily agricultural in the archival period to one that could attract secondary and tertiary industries. At the time of the study, unemployment was high and most of those with jobs were self-employed silversmiths or held government jobs (see also Lewis, 1966). The various changes in residential, industrial and public land use areas seemed to indicate basic changes in settlement pattern. These changes will be examined in relation to their fit with traditional epistemology.

Settlement Pattern and Traditional
Epistemology

The settlement pattern of Zuni was compared to the traditional epistemological premises of oneness, interdependence, harmony, and order interpreted from a nonhuman focus. In most cases, the traditional fit between epistemology and environment was not in evidence. The change in fit became more apparent when the town was compared to the historic area. The latter has remained a unified whole, as a series of interconnected structures with a definite centre and definite perimeter and thus exemplified a unity consistent with the traditional premise of oneness. The Shalako houses and kivas, totalities in themselves, continued to be present and the entire community remained relatively united by interconnecting doors. The transformation of the Roman Catholic Church (which by 1917 had become the physical centre of the town) into a Zuni structure, incorporated it into the rest of the community. In the modern town, oneness was not shown in the traditional manner for there were two town centres, the religious centres of the historic area and the governmental one. Instead of interconnected structures grouped around these centres, the new pattern consisted of detached buildings or groups of buildings spread about vacant spaces.

Similarly, the traditional manifestation of interdependence, equal groups of dwellings organized around a kiva, had no modern counterpart. Indeed there seemed to be a trend toward independence of land use areas. For example, new residential areas were solely residential, new educational areas solely educational. Organic harmony was apparent in the sense that various parts of the town were in stages of growth, renewal

and decay. But with the sense of oneness lacking in the modern town, it did not seem representative of an organic being; whereas the historic area could be considered as a living entity unto itself. While surveying the historic area, its organic nature became apparent for there were structures in various stages of growth, decay and renewal. It was noted in Chapter 3 that this resulted in considerable change over time in detail but not in basic form. The evolution of the Roman Catholic church from debris to restoration (funded by the Zuni Tribe, Catholic Church and National Park Service) and its symbolic transformation by its interior murals to something Zuni is a case in point, for the murals depicted growth and regeneration.

Some evidence of the premise of nonhierarchic order was apparent, in the sense that there were no "good" or "bad" areas of town; but no underlying principle of organization was found to tie all these areas into a whole, in spite of the new town centre.

Finally, there was a trend toward a change of town focus, for the new and expanding centre was the Tribal Headquarters. This symbolized a shift from the sacred to the secular.

In summary, there was consistent fit between the historic area and traditional Zuni epistemology. There was little difference in configuration between Zuni circa 1880 to circa 1925 and the historic area of 1976. Consistency of fit between the historic built environment and traditional epistemology had not changed. However, in terms of Zuni 1976 as a whole, there was considerably less fit with traditional epistemological premises.

Explanations of the Change in
Relationship Between Environment
and Traditional Epistemology

What has accounted for the change in fit is difficult to answer because it is complex. The reasons are interrelated and include:

- (a) the decrease in the sacred power base and the increase in the secular;
- (b) the influence of Anglo-American culture;
- (c) the increase of money and the subsequent change in priorities; and
- (d) the Zuni desire for self sufficiency.

Each of these need to be elaborated in order to understand the nature of the changes.

The change in power base has evolved over centuries and is marked by three time periods. First, there was the period of the Great Kivas (1300) during which priestly power was at its height. Second, with the coming of the Spanish, a form of Tribal Council whose members were elected by the priesthood, was introduced as a liaison between the two cultures. Finally, in 1934, the Indian Reorganization Act provided for a tribal government and the Zuni chose to adopt a modified version of the former kind of governmental organization consisting of a Governor, Lieutenant Governor, six Tenientes (Tribal Council members), an Executive Assistant and a Secretary, elected every four years by the Zuni people. This has remained as the government officially recognized by the United States. As originally conceived by the Zuni, the Tribal Council kept extra-tribal organizations and people from interfering with tribal affairs but as interaction with Anglo society increased under the auspices of the BIA, so did the responsibility of the Tribal Council.

Over time this has been shown in the physical environment with the disappearance of the great kivas and the advent of the Zuni Tribal Headquarters, the new centre of town. The shift from sacred to secular power is further reflected in the attitudes of the sacred and secular power groups to the future.

The following prophecy illustrates the traditional view.

Cities will progress and then decay to the ways of the lowest beings. Drinkers of dark liquids will come upon the land, speaking nonsense and filth. Then the end shall be nearer.

Population will increase until the land can hold no more. The tribes of men will mix. The dark liquids they drink will cause the people to fight among themselves. Families will break up: father against children and the children against one another....

But the people themselves will bring upon themselves what they receive. From what has resulted, time alone will tell what the future holds for us (Zuni People, 1972, p. 3).

But it is for our children to decide and work for. We cannot tell them of the way our people survived, for they would not believe us. We must just hope they, too, can survive what lies before them (Zuni People, 1972, p. 31).

This attitude of resignation signifies the passing of the elders. Still, their influence outweighs their numbers and they exude power (BIA, 1973). However, it seems to be acknowledged that the future belongs to the young for over half the population of Zuni was under 25 years of age (BIA, 1973).

The attitude of youth is toward progress, as voiced by the secular power base.

My people fully realize that we are at what is called "the point of no return". We can never go back to the old ways in line of what many people would call "the good old days".... like many Tribes, my people are just now taking the first step in progress, and one must say, almost reluctantly. Not because they are afraid, just realization that, all of a sudden, the transition period is upon us, and adjustments have to be made....

The Zuni people stand ready to put their shoulders to the wheel of progress and put forth their greatest effort, physically and financially, in order to move ahead. We will do our part, this can be depended upon! ...

The desired end result is to create a typical American community with an atmosphere of normal economy (Lewis, 1966, pps. 3 - 16).

With the shift from the sacred to the secular, lack of fit between the traditional epistemology and the built environment can be explained, for the epistemological premises were firmly grounded in Zuni religion. Thus lack of fit reflects in part the decrease of the sacred power base. But epistemology is robust over centuries (Thompson, 1945) so this explanation cannot fully account for what has transpired.

The second possibility is related to the influence of Anglo-American culture, for there have been concerted efforts to educate and convert the Zuni to the lifestyle of mainstream America. The success of such measures is far from clear. For example, Zuni children were sent to school because the adults believed that learning to read and to figure was useful. The children virtually ignored subjects such as history and relied on tribal versions of this information (McFeat, personal communication, 1976). In addition, Zuni World War II veterans who had adopted aspects of the Anglo lifestyle reverted to former mores upon their return to Zuniland due to social pressure (Adair & Vogt, 1949). These were instances in which new ways were learned outside Zuniland and then

brought back and for the most part rejected. However, it is also evident that the Zuni did in some cases slowly accommodate and assimilate extra-cultural elements. This is illustrated by the Roman Catholic Church described in the foregoing section, initially rejected, then forming the pueblo centre and now a nationally recognized (and restored) monument. In addition a continually significant Anglo impact is tourism, for in order to attract tourist dollars, things must be "up to Western standards". Thus services must be provided or improved to encourage this industry. To this end a motel was being planned at the time of this study. In addition, during an interview with the Governor, Mr. Laselute, he expressed a strong desire that the historic area be recognized as such by the U.S. government so that funding would be granted for its renovation as an historic site.

Moreover there is considerable concern with a general clean up of the area to make it visually appealing to the Western sense of aesthetics. For example, a clean up of the Zuni River and the provision of landscaping and parks along its shores, befitting its cultural significance, has been recommended (Chambers & Campbell, 1966). In addition, the government has been eager to replace outhouses with indoor plumbing and has made a concerted effort to encourage tribespeople to remove the animals that were grazing nearby. Moreover, the Governor, Mr. Laselute, (personal communication, 1976) voiced concern about the array of mobile homes. According to several informants, it is primarily the younger more acculturated people who purchase these homes, for they want a dwelling by the quickest possible method. The traditional house takes a long time to construct and is very expensive considering the ceremonial obligations during the Shalako. The government assisted houses have waiting lists,

slow delivery and are expensive. The option of building a home by themselves is not pursued because it requires time away from their jobs and also because it is impossible to obtain bank loans to build on reservation land. However, the bank will grant loans for the purchase of a mobile home. These homes are sited according to personal preference on clan land. Due to temporal constraints, it was not possible to determine during this study whether they were oriented in line with Zuni philosophy. They were usually located alongside the house of a close relative, concomitant with a tendency to rely on the immediate family for friendship and assistance, as well as a preference to maintain a separate dwelling for the nuclear family. This manner of siting was not orderly according to Western standards and not visually appealing. Thus the Governor hoped that a building code would be the beginning of the implementation of order. Thus American standards are influencing the Zuni, as is the ethic of rapid progress.

Rapidity led to a preference for Western building practices and western contractors, for the traditional Zuni work ethic is unsuitable. A government report indicated that for this reason the Turnkey method of housing delivery works better than Mutual Help because it ensures that the house will be completed (BIA, 1973). Similarly when asked why the Tribal Headquarters was not made of traditional materials, the Governor replied that it would have never been built using tribe labour within the time constraints.

Integrally related to Anglo influence is the effect of money on the tribe, as a result of the flourishing turquoise industry. Thus Zuni has changed from a relatively poor tribe to one which is relatively affluent. Money and the things it buys have increased. There is evidence that much of this wealth has been spent on Western amenities. For example,

the number of telephones had increased to 1,100 in 1974 from 35 in 1962 (Social Services, Pueblo of Zuni, 1975). Instead of going to the expense of hosting the Shalako to get a new home, Western housing has been acquired.

Young people especially prefer mobile homes or those of cinder block. Government buildings similarly are of prefabricated construction again for the purpose of quick delivery at affordable prices. But this method is not without its costs. While a home or building can be made in record time it is less than comfortable to be in. Without going to the expense of insulation, it is extremely warm in summer and very cold in winter.

There is a high priority placed by the Zuni tribal government on progress, on advancing in a cost-effective, efficient manner and Zuni development is now evaluated in economic terms (Chambers & Campbell, 1966; Lewis, 1966; Laselute, personal communication, 1976; Napetcha, personal communication, 1976).

Finally, there is the Zuni desire for self sufficiency. The Zuni people want to be an independent, functioning community (Lewis, 1966). Until recently this was viable by having the Governor stave off the Anglos so that impact to the culture was minimal. However, with increasing contact, the Zuni have been actively phasing out all BIA and U.S. government programs in favour of Zuni operated enterprises (Social Services, Pueblo of Zuni, 1975). The proliferation of such services in the last 15 years is immense. Consider the building industry: There are a variety of programs and offices responsible for building modern Zuni, most of which were founded between 1969 and 1973. They are listed

in Table 13 (p. 230) and will be briefly described in terms of their purpose:

- (a) the Economic Development Office, founded "to establish and program economic development services that are useful and pertinent to the accomplishment of alleviating conditions of excessive unemployment and/or underemployment";
- (b) the Home Improvement Program founded "to improve housing conditions for all eligible Zuni people by bringing homes to a standard condition defined as 'decent, safe and sanitary'";
- (c) the Housing Authority founded "to provide safe and sanitary houses for the Zuni people";
- (d) the Universal Telephone Company founded "to provide telephone services for Zuni";
- (e) the Utility Authority founded "to supply the community with water, gas, sewer and solid waste pickup services". The Division also heads Engineering, Buildings and Grounds, Safety and Sanitation;
- (f) Roads Construction which "began operating as a roads maintenance organization.... [and later] included construction of new roads as its major purpose";
- (g) the Division of Programs founded to coordinate and assimilate BIA programs into the Tribal Organization;
- (h) the Zuni Building Company founded "to repair, remodel and build structures within the Zuni community";
- (i) the Zuni Conservation Enterprise founded "to control land and earth movements, construct roads and increase job availability in Zuni";

Table 13

Organizations and Programs Concerned
With the Zuni Built Environment

Organization	Founding Date	Purpose
Economic Development Office	1967	Economic development
Home Improvement Program (HIP)	1969	Improves housing
Housing Authority	1967	Provides homes
Universal Telephone Company	1962	To provide telephone services
Utility Authority	1970	Supplies water, gas, sewer and solid waste pickup services
Roads Construction	1971	Constructs roads
Division of Programs	1972	Coordinates and assimilates BIA programs into tribal organization
Zuni Building Company	1971	Repairs, remodels and builds structures in Zuni
Zuni Conservation Enterprise	1971	Controls land and earth movements
Zuni Rental Enterprise	1972	Rent", leases and maintains tribal property
Zuni Tribal Council	1934	Tribal government

- (j) the Zuni Rental Enterprise founded "to rent, lease and maintain property owned by the tribe . . . and . . . as a future goal the construction of additional homes"; and finally
- (k) the Zuni Tribal Council headed by the Zuni Governor who is the key person responsible for tribal government (Social Services, Pueblo of Zuni, 1975).

Underlying this proliferation of organizations is the implicit premise of independence, i.e. the sooner the tribe can function in a bureaucratic manner the sooner it will be left to manage its own affairs. But the critical question is: According to whose standards is "adequate functioning" defined? It seems obvious that U.S. government agencies will remain until the Zuni are able to demonstrate the ability of the tribe to function in an efficient, cost-effective manner. Thus paradoxically in order to remain Zuni the tribe must become "Americanized"!

All of the four possibilities are interrelated. There is no single cause to which lack of fit could be attributed. Whatever the possible causes or explanations, there are a variety of opinions about future development.

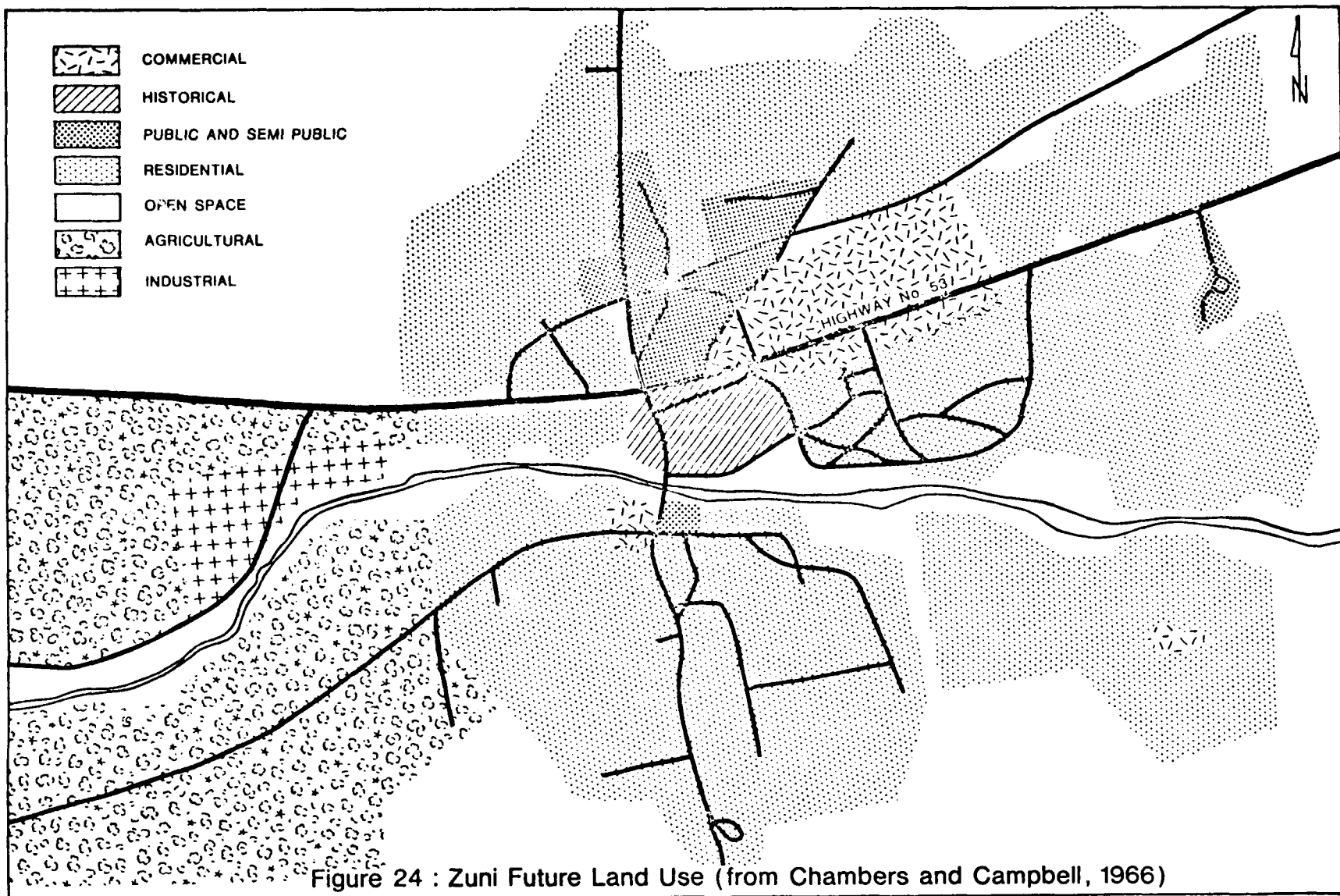
Attitude to Development

The attitude of these people to the changes in their community is mixed according to consultants. There were people eager to push Zuni into the 20th century and make it into a thriving American town. There were people who wanted to remain in the traditional lifestyle. And there were those who were caught in the middle, knowing they could never go back and yet not quite certain about how to go forward.

One senses in many a feeling of discomfort yet a resignation to the inevitable, for Zuni of the future very likely will continue its break with traditional epistemology and plan according to a Western planning model of land use. Consultants were hired to prepare such a report (Chambers & Campbell, 1966). The consultants raised the question: "Is the Zuni pueblo a city and should the Zuni pueblo become or be transformed into the contemporary American community?... With only minor qualifications this consultant has answered yes..." (Chambers & Campbell, 1966, p. 2). Thus, they recommended the division of Zuni into seven land use areas: (a) an historic area renovated for use as a tourist attraction; (b) public and semi-public areas; (c) commercial facilities mainly along Highway 53; (d) residential areas; (e) an industrial park; (f) agricultural spaces; and (g) open spaces. Each area would have distinct boundaries and each would be relatively separate (Figure 24, p. 233). The Governor stated that Zuni is developing according to this plan, with few modifications. One modification was the mapping of all sacred areas so that development would not violate shrines. Thus Zuni of the future will resemble an American town.

Summary

The Zuni built environment which, over the period of 100 years, changed from being closely related to traditional epistemology to increasingly reflect a lack of fit. This lack of fit was attributable to several kinds of impacts on components of the cultural fabric including: level of acculturation, changes in familial relationships, the preponderance of youth compared to the total population changes in economic base, the rise of the turquoise and tourist industries, the rise of the tribal government, cost and accessibility of material goods and the tribal government policy of Americanization in order to maintain self-sufficiency.



At the turn of this century,

the Pueblo itself was basically one large building, at some points rising four or five stories, quite a feat considering there was only wood, stone and adobe to build with....

By 1910 the Zuni Pueblo was no longer a many-storied structure. Also in the first decade of the twentieth century the first telephone line was run to the pueblo. In 1913 the first automobile was seen on the reservation... but the people as a whole were somewhat slower to take to the new machines. It was reported in 1902 that there was only one spoked-wheel vehicle on the reservation.... It was not until the mid-1930's that Coleman lamps replaced kerosene lanterns and a modern water supply was installed.

It was not until 1950 that electricity was introduced into the Pueblo and not until 1955 that most families had switched to the use of automobiles. But today there is a modern water supply, electricity, paved roads, telephones, automobiles, and television (Pueblo of Zuni, 1973, p. 24).

A Western planning model has been selected for future development. By implication then, a break between traditional epistemology and the physical environment has been chosen though there was no evidence that this was a conscious choice. It seemed that the governmental position is that there are simply no other options.

CHAPTER 6

DISCUSSION OF RESULTS

"We have our homes; we are men again" (McLuhan, 1971, p. 74).

This chapter will briefly summarize the results of these studies, discuss them in terms of the concept of fit and comment on the implications for the planning of built environments.

The results described in the previous chapters have offered some evidence in support of the three hypotheses postulated in Chapter 2. First, Chapter 3 presented evidence that in the Navajo and Zuni cultures there was a consistent relationship between the traditional epistemology and each of the traditional dwelling unit, traditional ceremonial unit and traditional settlement pattern, in support of the hypothesis that in different cultures there will be differences in the physical environment which reflect and are reflected in different epistemological positions. Second, Chapter 4 cited data revealing instances of consistent and inconsistent relationships between the traditional epistemology and the modified traditional dwelling unit in these cultures, and a predominantly inconsistent relationship between the imposed dwelling and the traditional epistemology of the Navajo and Zuni. The description of Zuniland in 1976 suggested that there was a consistent relationship between the built environment of the historic area and traditional epistemological premises; but there was a lack of agreement between the physical environment of the rest of the town and traditional epistemology. This is likely to continue as a direct result of choosing a Western planning concept on which to model future development. The interpretation of

consistency used in this study and its implications for future work merit considerable elaboration.

Consistency has been interpreted as a general trend rather than a one-to-one correspondence between the built environment and epistemology. When the environment-epistemology relationship was addressed at the societal level, internal contradictions were found within the built environment, the epistemological premises and in the relationship between the two. For example, the Navajo premises of nonhuman superiority, anthropocentric focus and human intimacy with deity could be viewed as somewhat contradictory. Yet it was not the premises per se but their interpretation in relation to each other which brought them into focus as a coherent unit exemplifying a particular epistemological position. This is in accordance with interpreting a particular cultural epistemology as a position along the tm : fm continuum. Each position must be considered as a mixture of both tendencies and thus it is possible to have evidence of each. Even though premises may appear to be contradictory, they are manifestations of the concurrent operation of these two forces which generate each other and exist in varying ratios. Thus it is not surprising that evidence for both tendencies was found in both cultures, for these forces are part of any epistemological position and thus should be manifest in any medium in which the epistemological message is carried. Another perspective on the study of mergence tendencies is recognizing that it may be more a matter of individual experience than overt expression in any medium.

Only one medium, the built environment, was considered in this study. It is possible that under various conditions the level of evidence within the medium may shift (e.g. from the behavioural to the symbolic). For example, when a built environment form is imposed upon a culture (as in

Study 3) what seemed to be almost complete misfit at the level of physical description, may be adapted in a consistent manner through changes in behaviour and uses of space. This warrants further investigation as documentation of this possibility is lacking. It may also be the case that evidence of an epistemological position shifts in the media through which it is expressed under varying conditions. For example, presently at Zuni the epistemological message may be carried in a medium other than the built environment. As has been shown in Study 4, a variety of factors resulted in the choice of a Western planning model and precluded consistent expressions of epistemological view. A concurrent study of various media would be fruitful in explicating this issue.

Whether or not a cultural epistemological position may shift as a result of various impacts has not been considered in this study. Robustness of epistemology has been assumed. The question itself may be a function of the time period under study, for 100 years is relatively short in the history of a culture. It may be too short a period in which to place trends and changes in the cultural fabric into perspective. Periodic misfit and the role of particular sources of influence may have been overemphasized. Ethnographic concern with the topics of deviation and innovation may have contributed to the focus on change. In contrast, when pueblo architecture was examined over 1500 years consistency of pattern was amply demonstrated (McFeat, 1960).

At the present stage of conceptual development, it is not possible to delineate an epistemological position along with the tm : fm continuum with great precision. It would seem that cultural positions are best understood

when analyzed comparatively from the perspective of their particular epistemologies. It is the general orientation of the epistemology that is indicative of the nature of the relationship between tm and fm, allowing the judgment to be made that one particular position is more tm - or fm - oriented than another. Thus although epistemology has been assumed to be independent of built environment or any other medium through which its message may be carried, there may be an interdependence that was not recognized. Further, refinement and articulation of tm and fm tendencies may enable a more direct and independent formulation of built environment criteria, rather than having to rely on the epistemology of the culture in question.

Another approach for future study which would help clarify the nature of the environmental and epistemological interrelationships, would be one using two levels of analysis, the individual and societal. This might allow an understanding of the origin of individual differences and shed some light on the process of change.

In addition to the concepts of consistency and tm : fm tendencies, the notion of fit has been used to describe the relationship between the built environment and traditional epistemology. This study has provided some evidence that the built environment is the result of several factors including cost and accessibility of materials, technology, economics, social pressures, isolation and acculturation, as well as epistemological position.

For much of this chapter the environment- epistemology relationship will be considered in terms of the concept of fit. What is meant by goodness of fit, the continuity of fitness and the maintenance of fit will be described.

The Concept of Fit

The concept, goodness of fit, refers to

the ensemble comprising the form and its contents. Good fit is a desired property of this ensemble which relates to some particular division of the ensemble into form and context.... The symmetry of this situation (i.e., the fact that adaptation is a mutual phenomenon referring to the context's adaptation to the form as much as to the form's adaptation to its context) is very important.... We may even speak of a culture itself as an ensemble in which the various fashions and artifacts which develop are slowly fitted to the rest... (Alexander, 1969, p. 43).

Thus fit refers to harmony. It was already stated that there was a consistent relationship between selected components of the built environment and epistemology, in terms of Studies 1 and 2. In these cases, there was harmony between the context or cultural epistemology and the form, the conceptualization, organization and use, of the selected components that were examined. Thus the results of Studies 1 and 2 indicated goodness of fit. It should be noted that fit refers to harmony among all societal components and thus is not confined to the built environment and epistemology. Over time, various ways of maintaining fit were noted in terms of the choice of features "borrowed", behaviour in and conception of the structure. First, features were chosen by the Navajo and Zuni which did not significantly violate the environment-epistemology consistency (e.g. windows). Second, behaviour was modified to ensure fit. For example, when expensive features were adopted in the hogan, family members near death were taken to the hospital (Landgraf, 1950). In this way, the hogan would not have to be abandoned in the case of death and hence

the taboo about inhabiting a dwelling possibly infested with evil from the corpse was avoided. Similarly in Zuni, when windows were adapted for use in kivas, they were painted over so passersby would not look in and thereby violate its sacred nature (Bunzel, 1932). Traditionally one would never look in at sacred places or meetings. If such an instance occurred the trespasser was initiated into the group. With the use of windows and the increasing acculturation of individual Zuni, such instances were more frequent. As a solution, they were painted over. Presently with the influx of tourists whose customs include careful scrutiny of all sites, the windows were boarded over. There were cognitive resolutions of fit as well. For example, some Navajos stated that traditional norms and taboos applied only to traditional dwelling structures (Sadalla et al., n.d.). Similarly, Zuni leaders disavowed their responsibility for regional development in their prophecy -- it was for the children to decide (Study 4). Thus compartmentalization was used, dividing forms into traditional and progressive structures, each under a different set of rules. Therefore it seems that fit can be maintained as the structures evolve in at least four ways: (a) by avoiding the incorporation of features which directly threaten consistency; (b) by adapting behaviourally; (c) by adapting cognitively, and (d) by adapting the structure.

The Maintenance of Fit

The results of the studies suggest certain factors of potential importance to the maintenance of fit, in terms of the likelihood of incorporating an environmental element in a manner consistent with epistemological context:

- (a) options regarding built environment forms;
- (b) attitude;
- (c) similarity between form imposed and existing form;
- (d) similarity between epistemological context of form imposed and existing epistemological context;
- (e) environmental meaning; and
- (f) environmental awareness;
- (g) temporal framework.

Each will be briefly elaborated on, based on the results of this research.

Options

The options members of a culture have about environmental features merits consideration, as highlighted by the results of Studies 2 and 3, for one of the major differences between the modified traditional and imposed dwelling forms were the options the Navajo and Zuni had about the features. In the former case it was a matter of suitability and in the latter, a matter of regulations (taking into account economics, technology, etc.). There are countless examples of the kinds of trade-offs where seemingly minor environmental features become major issues and narrow the options considerably. As an illustration consider the use of a fireplace. In traditional Zuni Shalako houses, there was a fireplace for the preparation of food. The Zuni builder could choose to include or exclude a fireplace if s/he decided to build a Western-style house, or could choose one or both of a stove and a fireplace. It was up to the preference and economic situation of the individual. This is not the case with the imposed dwelling for the inclusion of stove in the kitchen is assumed. Furthermore, a fireplace is not allowed in government-assisted housing because it considered a luxury

rather than a necessity. Thus with the imposed dwelling one has the choice of a Western-style house with a stove, or none at all (i.e. a structure built without government assistance). This situation is more constraining than the simple choice of stove versus fireplace, especially considering tribal financial status.

A further example is the difficulty that all pueblo Indians have experienced in obtaining HUD approval of adobe as an appropriate building material. Apparently after years of negotiation, HUD approved it as long as insulation and a structural steel frame was added, which missed the point of using the material in the first place (Committee on Interior and Insular Affairs, 1975). Again one has the choice of living in a HUD approved structure or not. Owing to the expense of insulation, many Zuni have chosen homes of cinder block which are very cold in winter and hot in summer.

A further indication of constraints concerns Navajo housing. HUD is building houses on the Black Mesa to alleviate a critical housing shortage. They are of HUD approved design but are on sacred land in direct violation of the traditional Navajo respect for nonhuman property rights. Thus the people have a choice between living in HUD approved housing on sacred land or living elsewhere in structures financed by themselves. There are those who would prefer HUD-approved housing but not on sacred land, or government assisted structures of other forms but not on sacred land. They have a choice, but the range of choice is narrow.

Attitude

One can speculate that the attitude of an individual or group toward the incorporation of an element may affect their receptivity to its adoption, and consequently if it was imposed, their willingness to fit form to context through behavioural or conceptual adaptation. For example, traditional Navajo have refused to comply in any way with attempts to introduce Anglo-American housing (Akwesasne Notes, 1976a) on the grounds that it violates sacred law. In contrast, the Zuni government decided to have a modern American community (Lewis, 1966).

Similarity Between Form Imposed and Existing Form

It seems reasonable to assume that one basis of compatibility between forms is similarity. Consider the Western-style house in relation to the Zuni Shalako house and the Navajo female hogan. On the one hand, the exterior of the Zuni Shalako house very much resembles a Western-style house for it has doors, windows and a rectangular shape. Thus in terms of adopting windows, doors or materials such as cinder block which is conducive to building rectangular shapes, it is assumed that there would be little difficulty in the Zuni accepting these features. On the other hand, the Navajo hogan is quite different in exterior shape from the house. In fact, it would be difficult to conceive of a rectangular, traditional hogan. However, since both the hogan and the house required doors, it is not difficult to envisage the adoption of the Western-style door by the Navajo. Thus similarity in features between an imposed environmental form and those existing in the culture is a possible factor in the adoption or "borrowing" of features between cultures.

Similarity Between Epistemological Context of Form Imposed and Existing Epistemological Context

The relationship between epistemological context and built form has been shown in Studies 1 and 2. On this basis, it is speculated that in cultures with similar epistemological positions there would be less difficulty in imposing or exchanging forms from one to another, than would be the case in cultures with different epistemological positions.

It should be noted that with respect to these two assumptions, similarity of form and similarity of context, epistemological or environmental determinism is not implied. It is possible to conceive of environmental similarities which exemplify different epistemological positions and vice versa. What is suggested is the easing of cultural interchange on the basis of similarity.

Environmental Meaning

The significance of a built structure to an individual or group could be important in assessing its evolution. For example, the kiva changed from a round to a rectangular shape and Mindeleff (1895) suggested this was a way of avoiding religious persecution by choosing to make the form similar to the dwelling. The round shape would have been more consistent with Zuni wholism but deliberate misfit was selected to preserve the existence of the sacred structure.

Awareness

The degree to which the built environment is a focus for an individual or group might influence the maintenance of fit, in that those aware of fit may try to maintain it.

For example, consider the staunch refusal of traditional Navajo to live in housing sited on sacred land because it violated its sanctity. The

presence of this housing was further interpreted as disruptive to the inherent relationship between nonhuman and human elements. There was a relationship between human and nonhuman that was expressed in the siting of human environments and it was viewed as important to maintain. A cognitive shift whereby one incorporates new elements unaware that they deviate from the norm (Roberts, 1951) may be considered a manifestation of lack of awareness regarding fit.

Temporal Framework

Alexander (1969) suggested the evolution of fit within a "feasible time period". If the evolution of the use and form of the Catholic Church at Zuni, mentioned in Chapters 3 and 5, is a typical cast, it may take over a century. Within any time periods there seemed to be a limit to the amount of fit which could be achieved. Indeed even in the archival period when consistency appeared to be at its height (in terms of the time frame of this study) not everything in the built environment could be said to closely fit with the traditional epistemological premises. Thus what is important to note is that fit refers to a general trend, rather than a point-by-point matching of environmental elements and epistemological premises. This suggests the importance for this study and also for the study of fit, of researching environmental features and components across time, and in that way ensures that the degree of fit was not specific to a particular, brief time period. In this study, the environments of concern were examined in time slices; yet within these slices the environment was not a frozen entity. It was shown that the introduction of a new element could be responded to differently by different members of the culture (i.e. acculturated and non-acculturated) indicating that much more than a straight environment-epistemology relationship was operating. A longitudinal study in which

change and evolution could occur is desirable, as was the case in our research, for only then was it possible to ascertain the changes in consistency. Thus, the historical perspective was shown to be valuable, for in spite of discrepancies and gaps in available information, patterns and trends were discernible. Moreover, the time frame enabled an evaluation of the more recent works in the longterm perspective, giving further evidence of the importance of a temporal framework. It was interesting that since 1895, when Mindeleff rued the disappearance of the Navajo hogan, this same opinion has been voiced over and over again. The predicted changes of each researcher with regard to this structure are the same, but few of them seemed to be aware (or at least acknowledge the fact) that their research findings were far from new. And the Navajo hogan continues to be the most widely used dwelling form of the Navajo, in spite of researchers predicting its imminent demise. Moreover, research findings such as the increase or decrease of a certain phenomenon or feature are relative to the context and/or time period in which they are noted. In this study, there were no systematic measures across time, making it difficult to discern whether changes have occurred. For example, Sadalla et al. (n.d.) noted the seemingly surprising finding that some Navajo dwellings violate the eastern orientation, which Mindeleff had noted in 1895. Since certain forms of a structure deviate from the cultural norm, it is difficult to discern when a feature is a deviation from the cultural standard and when the cultural standard itself may have changed. This reinforces the importance of longitudinal research as one means of putting findings in perspective. It also underlines the need to validate information from as many sources as possible. In that light quantitative data gathered over long periods of time, in addition to qualitative findings are useful. For example, in terms

of the violation of the eastern orientation in certain Navajo dwellings it would be useful to know: How many dwellings violated this out of the total dwelling stock? In what regions? By whom and for what reason? And it would be of value to have this information across time to get an indication of whether the phenomenon was actually decreasing, increasing, the same or transforming. Without the longitudinal perspective, the framework from which to evaluate degree of fit within a culture is lacking. For adequate assessment, quantitative and qualitative data are required.

If within a time period and over time, the environmental and social milieu is regarded as a system, then it is not surprising that changes in one area reflect and are reflected in some way by changes in other areas, though not necessarily at the same time. The focus of concern is the general readjustment of constituent parts to an element of impact which is part of a larger system of impacts. Under such circumstances, it is difficult to demonstrate the magnitude and direction of impact or response to it, because there are a multiplicity of variables involved which adjust and readjust at different times. The implication is, therefore, that the notion of environment as process, shaping and being shaped by social milieu is more appropriate to an examination of this nature than to regard the environment as a static entity which has single, unidirectional impacts.

It seemed obvious that the cultures are presently undergoing periods of misfit. However it is likely that at some point in the future, the amount of innovation introduced in response to impact from Anglo-American culture will level off, and then the possibility that a greater degree of fit can be achieved may actually occur. If it indeed is the case that the

system will eventually readjust and achieve a homeostatic balance, then the question might arise as to the reason for such concern about the present degree of shifting, since it seems to be endemic to the situation and part of an overall growth process. Closely related to this issue is the question: At what cost does this degree of reorientation or re-establishment of balance take place? The issues seem important to address in a future study, taking into consideration individual and societal viewpoints of both the impacted and the impactor.

Although a number of variables influencing fit are proposed, it should be noted that all other constituent influences and orientations of the social groups, such as acculturation, are influences as well. With the process of acculturation, the cultural base shifted too; perhaps the environmental epistemology so closely based on religious tenets was compartmentalized and thus not made to apply in the overall systemic way it traditionally had.

Implications for Planning

Up to this point, the focus has been on fit, describing the relationship between form and context and speculating about the ways in which it is maintained and the factors which contribute to it.

This has implications for planning situations in which one culture attempts to plan for the other -- as in impact or acculturative situations. This is particularly the case when Western plans and planners act on behalf of another culture.

Despite the rhetoric which heralds the call for new development paradigms, and notwithstanding the insistence on popular or local participation in decision making, it is our contention that most ... rural development models remain

mortally flawed by ... arrogant "up-down" relationships ... western biases and ethnocentricity.... No new approach to rural development will succeed unless it clearly manifests a thorough understanding of traditional human ecosystems which it intends to change, and the so-called client population's values, aspirations, mores, and perceptions of the biophysical environment (pps. 311 -312). [There is] an inability to describe ecological processes and environmental relations which affect a people without their being aware of them (Ruddle & Chesterfield, 1976, p. 315).

Thus fit is the result of systemic interaction. The shift in viewpoint from environment as product to environment as process has important implications for the construction of planning models, indeed for construction processes themselves. If environment is not just a physical product or a given, but part of a process influencing and being influenced by the social context with which it transacts, perhaps a change in priorities is in order with an increasing emphasis on a more participative process of "product" delivery. In this light, a number of planning approaches are suggested and evaluated, as possible models for dealing with fit under impact conditions.

Six strategies will be considered: (a) the American model; (b) the abridged American model; (c) the Fred Harvey model; (d) the cultural model; (e) the abridged cultural model; and (f) the transformational model.

The American Model

This refers to the imposed Western-style structures and models elaborated previously (Studies 3 and 4) in which no attempt is made to utilize features or structures of the environment of the impacted culture; only the forms and features of the impacting culture are used, hence the

direct placing of the form of one culture on the context of another. It is assumed that the members of another culture have the same wants and needs as the rest of Americans, and therefore want and need exactly the same design solutions, a seemingly homogeneous and therefore egalitarian solution. There is little attention to the need or want of others or recognition of diversity within impacted groups. The HUD code on Indian housing is an example for almost no mention is made that native Americans are not all the same and it is assumed that the same design solutions are appropriate. It reinforces the idea that the design solutions of the impacting culture are superior to those of the impacted culture. Hence this may result in resentment toward and/or rejection of the form.

The Abridged American Model

This strategy refers to the incorporation into design of elements particularly appropriate to the impacted culture. Thus salient features are extracted from the form of one culture so that environmental analogs of these features can be provided from another culture. For example, if the Zuni are able to convince HUD that a fireplace is a traditional necessity and not a luxury item, the incorporation of the fireplace into HUD housing for the Zuni could be considered an example of the abridged American solution. Note however, that this kind of fireplace refers to a Western-style fireplace; not one built in native fashion. This solution reflects a degree of sensitivity to the impacted culture, to the fact that the needs and wants of its members may be different from those of others. However, it also indicates that the needs and wants of people from other cultures are not sufficiently different from Anglo-American culture to warrant a drastically different design solution, but rather

the incorporation of a perfectly acceptable and familiar element of the impacting cultures. It may be interpreted by some as a purely cosmetic solution.

The Fred Harvey Model

This model is named after Fred Harvey, who set up a series of trading posts and tourist facilities in the southwest, the most famous of which are located on the South Rim of the Grand Canyon (Waters, 1975). Harvey was extremely interested in preserving and/or utilizing native culture in a manner suitable for tourism and so decided to incorporate, wherever possible, native elements in an effort to present and preserve the authenticity of the surrounding area and its peoples. In terms of the built environment, native craftspersons were hired to construct buildings using traditional materials in the traditional way. Thus in this model traditional form is rigidly adhered to but its context and function changes. This does not allow for native-generated evolution of form responsive to and responded by context, but rather stresses authenticity of previous form; its emphasis is on the past and the preservation of the past, rather than the evolution of the present in terms of native architecture. The stress in terms of the native is on the job of building a finished product; however, natives are not necessarily a part of its function. From another viewpoint, it could be interpreted that the real evolution is in terms of utilizing the form for extra-cultural purposes. The incorporation of features of a culture in this manner, reflects a degree of cultural sensitivity and infers a respect for the worth of native architecture. However, it can also be interpreted as emphasizing the quaint, "touristy", different aspects of native cultures, which could be seen as purely cosmetic. The fact that such architecture has

not found a place outside of the region noted for it implies that its relevance is in terms of the tourist trade, i.e. that it is appropriate to have tepees in "Indianland" but they would look incongruous in the suburbs.

An example of this model is the suggestion by the BIA (1973), Governor of Zuni, and consultants (Chambers & Campbell, 1966) for, what may be termed, frozen Zuni, the national recognition of historic area of Zuni restored to what it looked like circa 1700. According to the BIA (1973) report, tourists could wander about and watch piki bread being made; native crafts could be sold. It is being suggested as a method of attracting tourism, a valuable resource for the Zuni, and also a way of maintaining a cultural planning model, by having it preserved as something from the past (Chambers & Campbell, 1966). The utility of maintaining a planning model which bears no relationship to the official plan may be suspect. This kind of restoration may be viewed as a form of historical preservation or adaptation. On the one hand, form will be rigidly imposed and exteriors strictly maintained in a manner that has no traditional precedent. On the other hand, the context of this area differs from its historical one by becoming a tourist town. Whether this can be interpreted as adaptive preservation is difficult to ascertain. Historical authenticity of form or context may not be relevant. The restored area may acquire a new, positive meaning and significance to the Zuni. It may become a sign of accomplishment; it may localize extra-cultural contact and act as a barrier to prevent Anglos from invading other areas of Zuniland; it may become a meeting place. If it serves a positive function to the Zuni people, i.e. one that is sympathetic to their lifestyle, it may be considered as adaptive preservation.

The Cultural Model (Traditional)

This refers to the use of traditional native forms where possible and appropriate for the purposes they were intended to fulfil. Form and context are matched and thus it is usually appropriate, culturally significant and perfectly acceptable. It can become unacceptable to acculturating members of the impacted culture. For example, a native child who is taught Western-style aesthetics may find native dwelling forms unsavoury. This model does not imply preservation of form but rather its constant use and thus allows for its evolution; this can be a lengthy process.

The Abridged Cultural Model (Modified Traditional)

This model would use traditional cultural components along with whatever features of the impacting cultures sympathetic to the philosophy of the members of the impacted culture, as explicated by several examples in Chapter 4. It may be considered similar to the traditional borrowing of the past. It does allow choice and for the process of acculturation; however, it is likely to be a lengthy process.

It should be noted that a potential difficulty with the cultural and abridged cultural models is related to the levels of integration. As previously stated, the term levels of integration is used in the sense in which Steward (1963) used it, referring to the political complexity of a culture. The Navajo and Zuni had few levels of integration compared to mainstream U.S. culture, and this had a major environmental implication -- that they did not have concomitant environmental forms to match those of the impacting culture, on several levels (e.g. schools, government buildings). The members of the impacted cultures had few options regarding imposed forms. They could either accept or reject them; there has been little possibility of attempting to utilize their own form and/or to transform it

in terms of acculturative use. How then do the members of a culture arrive at an integrative design solution when they do not have concomitant environmental forms to match those of an impacting culture? A transformational model is proposed.

Transformational Model

In this model there would be an attempt to acknowledge the essence of the design problem and seek a solution appropriate to the problem within the cultural context, that is, to integrate the forms and contexts. For example, the Navajo hogan has been criticized by public health officials as unclean (e.g. the floors gather dust, lighting is poor). The solution to date has been to encourage the Navajo to live in Western-style housing. A synthesizing design approach would attempt to evaluate the features of the hogan that were important and how health standards could be improved within the context for it seems feasible that flooring and lighting can be improved within a relatively traditional hogan model. There are many levels of synthesis and transformation. What is essential to this approach is the recognition of epistemological context as a variable, shaping and being shaped by environmental form. It requires knowledge of cultural epistemology -- sensitivity to the theory in addition to the physical feature and/or behavioural norms of its design. In this sense then, levels of integration, become a false issue, because forms of environment concomitant with the impacting and impacted culture can be developed. However, the difficulty of the task cannot be underestimated.

Not only would it require individuals from both cultures who were aware of context and were able to translate it into a design program,

they must also be sufficiently aware of the variety of possible solutions and options feasible. It also requires that cultural significance and meaning be considered in determining economic feasibility and there is a major assumption that synthesis is valuable. This may be extremely difficult to recognize if the cultures in question have different epistemological viewpoints. If, as has been indicated, the built environment carries an epistemological message, then it could be perceived as very threatening to an impacting culture, to have members of an impacted culture continue to refine built environment components that carry contrary environmental messages, or it can be a matter of ignorance. Moreover, it may be that the epistemological positions under consideration are irreconcilable.

Thus of the planning strategies described, only the transformational model recognizes epistemological context as a variable, shaping and being shaped by environmental form.

The systemic relationship between form and context has been documented in this study. Note particularly the relationship between normative building codes and epistemological premises. A direct link between epistemology and building code has been shown such that, in essence one can say that environmental epistemology of a culture is its environmental planning theory, from which flows its building code.

This theory can be discerned from the epistemological premises and is consistent with a normative building code. When these premises are applied to the environment, the term environmental epistemology is used. Environmental epistemology is an implicit set of assumptions about how to build, use and view the built environment. It is based on a theory of knowledge of how the built and nonbuilt, human and nonhuman environment

is defined and put together. Thus environment in the context of culture is an epistemological statement or position. It is possible that the same statement may be made in different geographical locations and would look different. It is possible that two built environments may look similar but reflect different epistemological positions. This is not meant as a deterministic statement, but rather to state that environment evolves in a consistent manner with epistemology both shaping and being shaped by it. It is the consistency or fit which is important. This fit is of cultural definition and can be considered "a sense of place" -- a way of being grounded.

APPENDIX I

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Table A
HRAF Categories Surveyed to Determine
Existence of Appropriate Built
Environment Components

		<u>Existence of Structure in Culture</u>	
File	Category	Navajo	Zuni
275	Drinking establishments		
342	Dwellings	xx ^a	xx
343	Outbuildings	xx	xx
344	Public structures	xx	xx
345	Recreational structures		
346	Religious & educational structures	xx	xx
347	Business structures		
348	Industrial structures		
349	Miscellaneous structures		
361	Settlement pattern	xx	xx
364	Sanitary facilities		
365	Public utilities		
366	Commercial facilities		
367	Parks		
368	Miscellaneous urban facilities		
529	Recreational facilities		
547	Night clubs & cabarets		
631	Territorial hierarchy		
632	Towns		xx
633	Cities		
634	Districts		
635	Provinces		
636	Dependencies		
712	Military installations		
743	Hospitals & clinics		
778	Sacred objects & places	xx	xx

^a xx's indicate presence of structure in the culture.

Table B

Results of Survey of HRAF on Navajo Culture

Regarding Selection of Appropriate Built

Environment Components

HRAF	Environment Component	Conceived by Natives	Constructed by Natives	f ^a	Cultural Significance
342	Dwellings				
	- female hogan	x	x	6	major bldg
	- brush shelter	x	x	5	temporary
	- other	some	x	9	not prevalent
343	Outbuildings				
	- sweathouse	x	x	2	religious
	- storehouse	x	x	2	support structure
	- corrals	x	x	2	support structure
344	Public struc- tures (see 346)				
346	Religious & educational structures				
	- male hogan	x	x	7	major religious structure
	- Yeibichai hogan	x	x	8	religious structure
	- sweathouse (see 343)				
347	Business structures - trading post				<u>not</u> native
361	Settlement pattern - cluster	x	x	10	basis of settlehent
366	Commercial structures (see 347)				
631	Territorial hierarchy (see 361)				
778	Sacred places	x		1	great religious significance

^a Relative frequency of occurrence, implied from HRAF

Table C
Results of Survey of HRAF on Zuni Culture
Regarding Selection of Appropriate Built
Environment Components

RAF	Environment Component	Conceived by Natives	Constructed by Natives	f ^a	Cultural Significance
42	Dwellings				
	- Shalako house	x	x	3	important religious function
	- pueblo house	x	x	3	dwelling
43	Outbuildings				
	- ovens	x	x	2	support structure
	- corrals	x	x	9	support structure
	- wood racks	x	x	3	support structure
44	Public structures (see 342, 346)				
46	Religious & educational structures				
	- kiva	x	x	8	important religious function
	- fraternity ^b	x		6	religious
	unction house				
	- clan house ^c	x		7	religious
	unction				
61	Settlement pattern				
	- pueblo	x	x	11	only one, basic to pattern
	- summer 'towns'	x	x	10	support above element
78	Sacred places	x		1	great religious significance

^a Relative frequency of occurrence, implied from HRAF

^b A dwelling used for fraternity meetings

^c A dwelling used to house clan fetish

Table D
HRAF Categories Selected Based On
Possibility of Containing Relevant Information

HRAF	Category ^{a,b}	Reason for Selection
000 ^c	Material not categorized	General information
10	Orientation	General information
11	Bibliography	Methodology
12	Methodology	Methodology
13	Geography	General information
131	Location	General information
132	Climate	General information
133	Topography & geology	General information
136	Fauna	General information
137	Flora	General information
154	Adjustment processes	General information
16	Demography	General information
161	Population	General information
162	Composition of population	General information
166	Internal migration	General information
17	History & culture change	General information
18	Total Culture	General information
33	Building & construction	Built environment component
34	Structures	Built environment component
35	Equipment & maintenance of buildings	Built environment component
351	Grounds	Built environment component
352	Furniture	Built environment component
353	Interior decoration & arrangement	Built environment component
356	Housekeeping	Built environment component
358	Maintenance of nondomestic buildings	Built environment component
36	Settlements	Built environment component
42	Property	Built environment & epistemology
51	Living standards & routines	Built environment component
52	Recreation	Built environment & epistemology
551	Personal names	Epistemology
552	Names of animals & things	Epistemology
553	Naming	Epistemology
591	Residence	Built environment component
592	Household	Built environment component
619	Tribe & nation	Built environment component

62	Community	Built environment component
621	Community structure	Built environment component
63	Territorial organization	Built environment component
67	Law	Epistemology
671	Legal norms	Built environment & epistemology
672	Liability	Built environment & epistemology
68	Offenses & sanctions	Built environment & epistemology
688	Religious offenses	Built environment & epistemology
689	Social offenses	Built environment & epistemology
75	Sickness	Epistemology
76	Death	Epistemology
77	Religious beliefs	Epistemology & built environment
80	Numbers & measures	Epistemology
81	Exact knowledge	Epistemology
82	Ideas about nature & man	Epistemology
85	Infancy & childhood	Epistemology
867	Transmission of cultural norms	General information
868	Transmission of beliefs	Epistemology
87	Education	Epistemology
88	Adolescence, adulthood & old age	Epistemology

- a Numbers cross-indexed with those selected were excluded (e.g. 54, entertainment was excluded because it is redundant with 52, recreation).
- b Built environment component categories excluded were based on results in Table A.
- c Regarding HRAF numbers, two digits refer to major categories and three digits to subsections. Where a major category is not followed by a subsection of it, the entire category was searched.

Table E
Data Organization Format for Information about
Built Environment Components

Built Environment Component	Organization	Function	Conceptualization
Component: _____			
Structure A: _____			
Physical features			
a. _____			
b. _____			
Social features			
a. _____			
b. _____			

Notes on Archival Data Collection Form

The collection form was designed to cover the topics relevant to the hypothesis of Study 1. In particular, it dealt with: (a) components of the built environment, specifically those selected for the study, in terms of conceptualization, function, organization and physical appearance; and (b) cultural epistemology, including its relation to the nonhuman environment in general. These topics are reviewed and the questions and headings on the forms which deal with them are listed below.

1. Environment components (Section A), including:

the kinds of components (Section A, #1);
physical appearance (Section A, #2);
organizational appearance (Section A, #3);
conceptualization (Section A, #5, #6, #7, #8, #9, #10, #11,
#12,
#13, #14, #15);

2. Epistemology (mainly Sections B and C):

the limits of and methods of knowing and verifying knowledge (Section A, #10, #11, #12, #13; Section B, #2, #3, #4, #5);
extent of harmony between knower and (un)known (Section A, #9; Section B, #2);
signs and symbols representative of worldview (Section A, #6; Section C, #2);
extent of subjectivism (Section C, #1, #4, #5);
extent of objectivism (Section A, #8; Section B, #6; Section C, #3);
conceptualization of nonhuman environment in general (Section A, #5, #6, #7, #8, #14, #15; Section B; Section C, #1, #4, #5).

The headings and subheadings on the form were to aid the rater in finding the appropriate area for cataloging a passage as easily as possible.

Instructions for Cataloguing the Passages

I need assistance in working out a system for cataloguing material. To do this, several people including yourself, are being asked to read passages and then catalogue them according to the following instructions.

Please read the form carefully NOW, noting the headings and sections. If you have any questions about the meaning of a word or phrase on the form, please ask.

Cataloguing Procedure

As you know from reading the form, there are three sections. Section A deals with the physical components of the environment. These physical components are listed in Section A, Number 1. Section B deals with the environment in general. Section C deals with the culture in general.

Read the first passage (Number One). Then fill out the ARCHIVAL DATA COLLECTION FORM marked Passage Number One. When you catalog the passage USE ONLY THE WORDS MENTIONED IN THE PASSAGE. DO NOT PUT IT INTO YOUR OWN WORDS. Please refer to the passage as often as you like, when you catalog it.

Note that in Section A, physical components of the environment, each component is to be catalogued on a separate ARCHIVAL DATA COLLECTION FORM. If you need additional forms to catalog a passage, please use one from the pile marked Extra Forms. Remember to make the Passage Number and your initials at the top of all the pages on any extra forms you use.

You may want to put the same information under more than one heading and/or under more than one section. Feel free to do so.

If a part of a passage is totally irrelevant, do not catalog it.

If an entire passage is irrelevant, put an X through the ARCHIVAL DATA COLLECTION FORM for that Passage Number. If an entire passage applied to one category number just write the words, "Entire Passage" in the category space.

If you run out of space, please use the back of the page. Remember to identify it with the Section (A, B, or C) and the number of the topic, heading or question.

When you are finished with Passage Number One, go on to the next, until all have been catalogued. If you have any questions about this procedure, please ask.

On the following pages are samples of cataloguing. Please read them before you begin cataloguing.

Archival Data Collection Format

Passage Number

Culture

1. Navajo; Zuni
2. Area file code

Location

1. Village(s) where research was undertaken

Bibliographic Source

1. HRAF complete source
2. HRAF number
3. Occupation of researcher
4. HRAF evaluation of quality of research
5. Period of field work

Methodology

1. Purpose of research
2. Who gathered data
3. Methods used
4. Reliability (any measure of)

Physical Components of the Environment

as on Archival Data Collection Form

The Environment in General

as on Archival Data Collection Form

The Culture in General

as on Archival Data Collection Form

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Coder's Initials: _____

SECTION A

PHYSICAL COMPONENTS OF THE ENVIRONMENT

Identification of Component

1. Identify the physical component mentioned in the passage (please check one). REMEMBER to fill out a separate sheet for each component mentioned in the passage.

- a. _____ natural environmental setting (e.g. a landscape, plains, canyons, plateau).
Specify: _____
- b. _____ built environmental setting (e.g. dwelling, architectural structure, city, settlement).
Specify: _____
- c. _____ natural environmental element (e.g. water, river, heat, mountain, a direction such as north).
Specify: _____
- d. _____ things to eat or drink (e.g. drinking water, food, alcohol, narcotics).
Specify: _____
- e. _____ animate element (i.e. living according to us; e.g. animal, plant but NOT human).
Specify: _____
- f. _____ object (e.g. clothing, totem, utensil).
Specify: _____
- g. _____ human body.
Specify part: _____

FILL IN THE FOLLOWING FOR THE COMPONENT YOU HAVE IDENTIFIED

Appearance of the Component

2. Physical Appearance (i.e. what does it look like* specifically: colour, shape, size, location of component; materials of which it is made; subcomponents and their physical appearance).

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Coder's Initials: _____

- 3a. Organizational Appearance (i.e. what gives an orderly structure to it? how is it arranged? how do the parts relate to the whole? is there a system or pattern?).

- b. Is there a lack of order? If yes, please check ____.

Function of the Component

- 4a. How is it used? What is its function or purpose?

- b. When is it used? _____

- c. Where is it used? _____

- d. By whom is it used? _____

Ideas about the Component

5. Conceptualization of this component (How is it formulated? What are the theories or beliefs about it? What is its cultural significance?)

- 6a. Is this component a sign or symbol of a theoretical principle, cultural theme, belief, axiom? (Please check): Yes ____; No ____.

- b. If yes, what does it represent? _____

7. Is this component sacred? (Please check): Yes ____; No ____.

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Coder's Initials: _____

8. Degree of discreteness of component

- a. Is this component seen as bounded and separate, or does it merge with or become a part of something else?

- b. If it merges, with what does it merge? _____

Relationship Between this Component and the Human Being

9. What is the relationship between this component and the human being? (please check):

- a. _____ harmony
- b. _____ disharmony, with the human superior to the component
- c. _____ disharmony, with the component superior to the human
- d. _____ other. Specify: _____

Knowledge About the Component

10. Who can know about the component? _____

11. What can the human know about this component? _____

12. How much can the human know about this component? _____

13. How can the human find out about this component? _____

14. How will the human know that what s/he finds out about this component is correct?

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Coder's Initials: _____

Rules and Regulations Regarding this Component

15. Norms, standards, customs, mores (etc.) dealing with this component:

16. Laws (e.g. legal norms, offenses, sanctions, etc): _____

Other

17. Anything relevant to this section but not appropriate to any of the above headings or questions:

SECTION B

THE ENVIRONMENT IN GENERAL

1. What is the relationship among the elements in the world, in this culture's world view?

a. _____ harmony. Specify: _____

b. _____ disharmony.

i. Is one element or group of elements superior to another?
(Please check): Yes ____: No ____.

If yes:

ii. Which is superior? _____

iii. To what is it superior? _____

iv. Is one element or group of elements different from another?
(Please check): Yes ____: No ____.

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Codefs Initials: _____

If yes:

v. Specify element and/or groups involved: _____
_____vi. In what way do these elements and/or groups differ?

c. _____ other. Specify: _____

Knowledge about the World

2. Who can know about the world? _____

3. What can the human know about the rest of the world?

_____4. How much can the human know about the rest of the world?

_____5. How can the human find out about the world? _____
_____6. How will the human know that what s/he finds out about the world is correct?

_____Discreteness of Environmental Elements7a. Are the elements or groups of elements in the environment seen as bounded and separate, or do they merge with or become a part of something else?

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Coder's Initials: _____

b. If they merge, with what do they merge? _____
_____Rules and Regulations8. Norms, standards, customs, mores (etc): _____

_____9. Laws (e.g. legal norms, offenses, sanctions, etc.): _____

_____Other10. Anything relevant to Section B but not appropriate to any of the
above headings or questions:

SECTION C

THE CULTURE IN GENERAL

Theories1. Theories (principles, elementary propositions, cultural themes,
beliefs, axioms, dogma, truths, attitudes):

_____2a. Is there a sign or symbol of a theory (principle, etc)?
(Please check): Yes _____; No _____.

If yes:

b. What is it? _____

ARCHIVAL DATA COLLECTION FORM

Passage Number: _____

Coder's Initials: _____

c. What does it represent _____
_____Discreteness of Elements3a. Are the elements seen as bounded and separate, or do they merge with or become a part of something else?

_____b. If they merge, with what do they merge? _____
_____Rules and Regulations4. Norms, standards, customs, mores (etc): _____

_____5. Laws (e.g. legal norms, offenses, sanctions, etc): _____

_____Other6. Anything relevant to this section but not appropriate to any of the above headings or questions:

Letter Requesting Permission to Conduct Research in Zuniland

May 9, 1976.

Mr. Edison Laselute, Governor,
Pueblo of Zuni,
P.O. Box 338,
Zuni, New Mexico.
U.S.A. 87327

Dear Mr. Laselute:

My friend and I would like permission to visit Zuni this year, before the summer is over.

I am a student and am working on my doctoral degree. My interest is in Zuni buildings and whatever connection they have to the way the Zuni view their world. For this reason, I would like to visit Zuni and make notes about what the outsides of buildings look like. My friend has artistic talent and would like to make sketches of the outsides of buildings. These notes and sketches would be included in the paper I am writing for my doctoral degree. In exchange, we would like to give you a copy of this final paper to use as you wish.

At present we would like to visit on a daily basis, for up to four weeks -- during the last half of June and the month of July. In reading a pamphlet from the New Mexico tourist board, I noted that photography and sketching are permitted with a permit from your office. Are additional documents needed for what we would like to do?

If you require additional information about the purpose of our visit or our intended length of stay, please do not hesitate to ask. Enclosed is a stamped, addressed envelope for your convenience.

Thank you very much. We eagerly await your reply.

Respectfully,

Natalia M. Krawetz

Topics Discussed at Zuni

1. Specific plans for development.
2. Preferences regarding traditional and western environments.
3. Changes noted over the past 20 years.
4. Changes in built environment noted over the past 20 years.
5. Changes to come in the next 20 years (either that individual was aware of or thinks will occur).
6. Changes in built environment to come in next 20 years (either that individual was aware of or thinks will occur).
7. Attitude to these changes: a) past; b) future; c) regarding environment; d) other.
8. Historic area: preferences regarding it and perceived problems.
9. Housing delivery.
10. Any other topics of interest to respondent.

BUILDING SURVEY CODE*Age Segregated Buildings

1. orphanage
2. old age home
3. other (specify)

Commercial Facility

4. general store
5. grocery store
6. department store
7. restaurant
8. other (specify)

Dwelling

9. hogan - traditional
10. hogan - revised
11. log cabin
12. pueblo
13. mobile home
14. modern, wood-frame
15. modern, brick
16. cement block
17. small apartment (less than 10 apts.)
18. larger apartment
19. other (specify)

Educational Facility

20. school
21. other (specify)

Government Building

22. post office
23. jail
24. other (specify)

Medical Facility

25. clinic
26. hospital
27. other (specify)

Recreational Facility

28. community centre
29. cinema
30. playground
31. park
32. other (specify)

Religious Facility

33. church
34. sacred place
35. sweathouse
36. other (specify)
37. industrial structure
38. other (specify)

* Subject to amendment pending archival investigation

NOTES ON BUILDING SURVEY FORMAT

This format deals with three topics:

1. orientation of buildings (3a, 3b);
2. building type (4);
3. building characteristics (5).

Included within these is information on dwelling units (from building type, numbers 9 to 19 on Building Survey Code -- also found in Appendix); their exterior organization (5a) including their surround (5a, 5b).

BUILDING SURVEY FORMAT

1. Location: _____
2. Building Number (from survey map): _____
3. Orientation
 - a. agrees with map: Yes _____; No _____.
 - b. if no, draw it in, in relation to other buildings, on map.

Building Characteristics

4. Kind of building (enter number from SURVEY CODE): _____
5. Exterior markings
 - a. evidence of personalization:
 - i. on doors: Yes _____; No _____. Specify: _____

 - ii. on windows: Yes _____; No _____. Specify: _____

 - iii. on structure: Yes _____; No _____. Specify: _____

 - iv. on grounds: Yes _____; No _____. Specify: _____

 - b. landscaping: Yes _____; No _____.
 - c. fencing: Yes _____; No _____.

If yes,

- i. where (check):

a. around whole structure	_____
b. front only	_____
c. back only	_____
d. front & one side	_____
e. front & both sides	_____
f. one side	_____
g. both sides	_____

specify: _____

- less than 3 feet
- 1 to 3 feet
- 3 to 10 feet
- over 10 feet

a. open fencing _____
b. semi open _____
c. complete
visual
obstruction _____

APPENDIX II: RELIABILITY

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Procedures for Analysis of Reliability

Reliability regarding the placement of parts of the passage into sections of the ADCF. This analysis was undertaken using Chi-square. It was decided that the expected frequency of a passage being coded into any of the three major sections of the ADCF was 2.5 (out of five raters). The expected frequency of a passage being coded into a specific section (A, B, or C) of the ADCF was calculated on the basis of the number of subsections (out of the total of 55) that it contained. Then the frequency distribution for each word in the passage was determined. The resultant Chi-square was transformed into a z score according to the formula:

$$z = \sqrt{2 \times \chi^2} - \sqrt{2 \times df - 1}$$
 (Ferguson, 1970). Then the mean of these was calculated as a measure of this reliability for all the passages.

Reliability regarding the placement of parts of the passage into subsections of the ADCF. This analysis was undertaken in terms of percentages. There were 55 subsections of the ADCF, to which one was added (to represent the "not coded" category). The number of subsections that all five raters coded in the same way was calculated, out of the total of 56. This was transformed into a percentage. Then the mean of the passages was taken as a measure of this kind of reliability.

Reliability regarding the placement of exact words of the passage into subsections of the ADCF. This analysis was undertaken in terms of percentages. The measure of agreement was determined by the number (out of five) of the raters who coded specific words of a passage into a particular subsection of the ADCF. If all five raters agreed on the subsection into which the word would be placed the agreement was 100%, if 4, 80%, if 3, 60%, if 2, 40%; and if all 5 disagreed, 20%. It

should be noted that the decision regarding disagreement was arbitrary, in keeping with the sliding scale of percentages above. It could just as well have been considered to be zero. However, if no agreement had been considered as a value of 0% using the procedure outlined, it would have implied that agreement between two raters was worth relatively more than agreement on other levels -- which simply was not the case. Thus the use of the shorter range was deemed appropriate. Thus the reader should keep in mind that reliability on this measure has a range from 20% to 100%. The mean for all the words in the passage was taken as a measure of the reliability concerning that passage. And then the mean of the passages was taken as the measure of this kind of reliability.

Reliability Over Time

Procedures for analysis of reliability were the same as in the above study, except for the first case, reliability regarding the placement of the passage into sections of the ADCF. In this case, it was calculated as a percentage. Complete agreement (out of two raters) was 100%; complete disagreement was 50%. Thus this measure has a range from 50% to 100%. This was calculated for each word and then averaged over the number of words in the passage. The mean of the passages was taken as the measure of this reliability.

TABLE A

Reliability Study 1

Placement of Passages into Sections of ADCF

Passage Number	z	Passage Number	z	Passage Number	z
1	2.71**	45	5.98**	90	4.90**
2	1.72*	46	1.50	91	1.87*
3	0.64	47	5.49**	92	6.35**
4	8.50**	48	9.18**	93	12.63**
5	0.23	49	0.00	94	2.55**
6	3.30**	50	6.01**	95	0.55
7	10.09**	51	9.04**	96	2.86**
8	8.31**	52	10.50**	97	8.48**
9	0.85	53	6.03**	98	2.31*
10	6.15**	54	3.76**	99	7.90**
		55	1.32	100	3.43**

*p .05.

**p .01.

TABLE B

Reliability Study 1

Placement of Passages into Subsections of ADCF

Passage Number	%	Passage Number	%	Passage Number	%
1	80.35	45	83.92	90	92.85
2	78.57	46	87.50	91	94.64
3	71.42	47	83.92	92	89.28
4	75.00	48	94.64	93	91.07
5	89.28	49	91.07	94	94.64
6	80.35	50	92.85	95	91.07
7	92.85	51	92.85	96	92.85
8	91.07	52	96.42	97	89.28
9	89.28	53	91.07	98	94.64
10	87.50	54	83.92	99	94.64
		55	83.92	100	89.28

$$\bar{X} = 88.19$$

TABLE C

Reliability Study 1

Placement of Exact Words into Subsections of ADCF

Passage Number	%	Passage Number	%	Passage Number	%
1	69.76	45	60.69	90	72.15
2	70.00	46	62.00	91	60.00
3	62.17	47	62.74	92	83.29
4	59.61	48	60.00	93	55.47
5	62.00	49	59.38	94	40.00
6	68.87	50	73.33	95	66.87
7	77.89	51	60.00	96	80.00
8	84.65	52	73.65	97	65.07
9	68.15	53	58.95	98	76.67
10	67.88	54	50.30	99	60.00
		55	61.78	100	82.59

$$\bar{X} = 66.20$$

Table D

Reliability Study 2. Time 1.

Placement of Passages into Sections of ADCF

Passage Number	%
1	36.30
2	100.00
3	100.00
4	100.00
5	100.00
6	100.00
7	100.00
8	100.00
9	100.00
10	100.00
11	100.00
12	100.00
13	100.00
14	100.00
15	100.00
16	100.00
17	100.00
18	100.00
19	100.00
20	100.00

$$\bar{X} = 96.82$$

Table E

Reliability Study 2. Time 1.

Placement of Passages into Subsections of ADCF

Passage Number	%
1	98.21
2	100.00
3	100.00
4	94.64
5	98.21
6	100.00
7	100.00
8	100.00
9	100.00
10	100.00
11	100.00
12	100.00
13	98.21
14	96.42
15	100.00
16	100.00
17	98.21
18	98.21
19	96.42
20	98.21

$$\bar{X} = 98.84$$

Table F

Reliability Study 2. Time 1.

Placement of Exact Words in Subsections of ADCF

Passage Number	%
1	36.30
2	100.00
3	100.00
4	0.00
5	27.00
6	100.00
7	100.00
8	100.00
9	92.00
10	100.00
11	100.00
12	100.00
13	76.46
14	80.95
15	100.00
16	100.00
17	75.00
18	53.85
19	47.37
20	57.14

$$\bar{x} = 77.30$$

Table G

Reliability Study 2. Time 2.

Placement of Passages into Sections of ADCF

Passage Number	%
1	100.00
2	100.00
3	100.00
4	100.00
5	100.00
6	100.00
7	100.00
8	100.00
9	100.00
10	100.00
11	100.00
12	100.00
13	100.00
14	100.00
15	100.00
16	100.00
17	100.00
18	100.00
19	100.00
20	100.00

$$\bar{X} = 100.00$$

Table H

Reliability Study 2. Time 2.

Placement of Passages into Subsections of ADCF

Passage Number	%
1	100.00
2	100.00
3	96.42
4	94.64
5	96.42
6	100.00
7	100.00
8	100.00
9	100.00
10	100.00
11	100.00
12	100.00
13	100.00
14	100.00
15	100.00
16	96.42
17	100.00
18	100.00
19	96.42
20	100.00
$\bar{X} = 99.06$	

Table I

Reliability Study 2. Time 2.

Placement of Exact Words into Subsections of ADCF

Passage Number	%
1	100.00
2	100.00
3	50.00
4	82.50
5	0.00
6	100.00
7	100.00
8	100.00
9	100.00
10	100.00
11	100.00
12	100.00
13	100.00
14	100.00
15	100.00
16	69.23
17	100.00
18	58.33
19	17.00
20	100.00

$$\bar{X} = 83.85$$

Table J

Reliability Study 2. Time 3.

Placement of Passages into Sections of ADCF

Passage Number	%
1	100.00
2	100.00
3	100.00
4	100.00
5	100.00
6	100.00
7	100.00
8	100.00
9	100.00
10	100.00
11	100.00
12	100.00
13	100.00
14	100.00
15	100.00
16	100.00
17	100.00
18	100.00
19	100.00
20	100.00

$$\bar{x} = 100.00$$

Table K

Reliability Study 2. Time 3.

Placement of Passages into Subsections of ADCF

Passage Number	%
1	96.42
2	96.42
3	100.00
4	100.00
5	100.00
6	100.00
7	100.00
8	100.00
9	100.00
10	94.64
11	92.85
12	100.00
13	100.00
14	100.00
15	100.00
16	100.00
17	96.42
18	100.00
19	92.85
20	98.21
$\bar{X} = 98.39$	

Table L

Reliability Study 2. Time 3.

Placement of Exact Words in Subsections of ADCF

Passage Number	%
1	85.00
2	62.50
3	100.00
4	100.00
5	100.00
6	100.00
7	100.00
8	100.00
9	100.00
10	0.00
11	0.00
12	100.00
13	100.00
14	100.00
15	100.00
16	100.00
17	84.09
18	100.00
19	0.00
20	81.25
	$\bar{x} = 80.64$

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