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COMPARATIVE NUMIC ETHNOBIOLOGY.

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COMPARATIVE NUMIC ETHNOBIOLOGY

By

Catherine Louise Sweeney Fowler

A.B., University of Utah, 1962

M.A., University of Pittsburgh, 1966

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This dissertation was presented

by

Catherine S. Fowler

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and approved by

Dr. R. T. Hartman

Dr. G. P. Murdock

Dr. J. M. Roberts

Dr. E. A. Kennard Chairman

PREFACE

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Several persons have also contributed most generously of their time, energy and materials to see this project to completion. These include: E. A. Hoebel, Wick Miller and Alfred Whiting, who provided me with materials from their unpublished lexical files; Mary Haas of the Survey of California Indian Languages, University of California, Berkeley, who allowed access to materials on file there; William Jacobsen, Sven Liljeblad and Joy Leland, who willingly discussed the various theoretical and methodological problems reported; Edward A. Kennard, who served as my dissertation chairman and major advisor during my years at the University of Pittsburgh; George P. Murdock, John Roberts and Richard Hartman, who,

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Last, but by no means least, my husband, Don Fowler, served as my intellectual and emotional companion and helpmate throughout this and all other stages of my graduate career. This thesis is dedicated to him with affection.

Reno, Nevada, 1972 Catherine S. Fowler

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I. INTRODUCTION

A. Review of the Literature

Within the past decade, certain types of ethnographic and linguistic studies have come to occupy an important place in the anthropological literature. These are the formal semantic investigations of selected cultural domains, such as kinship systems, color categories, property-space relationships, residence rules, ethnobotanical classifications and others.[1] The aim of these studies in "semantic ethnography" has been to produce more accurate, relevant and predictive statements about cultural phenomena, by applying a rigorous methodology designed to systematically explore the relationship between certain linguistic forms, namely lexemes,[2] and their referents (Conklin 1955; 1962; Frake 1961; 1962; Goodenough 1957). The techniques of investigation, derived principally from descriptive linguistics, are designed to discover organizational principles for these phenomena in ways analogous to the linguist's discovery of phonological and grammatical rules. Semantic ethnographers, like linguists, hope for a unique relevancy, free of *a priori* biases.

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[1]See bibliographies in Sturtevant (1964), Hammel (1965) and Colby (1966) for applications to studies of color categories, kinship terminologies, residence rules, disease, ethnobiology, psychology, etc.

[2]A lexeme, as defined by Conklin (1962:121) is . . . "a meaningful form whose signification cannot be inferred from a knowledge of anything else in the language."

Semantic ethnography has been hailed by some as a giant step forward for descriptive anthropology. Sturtevant (1964:101), for example, states that "ethnoscience shows promise as the New Ethnography required to advance the whole of cultural anthropology . . . " as it " . . . raises the standards of reliability, validity and exhaustiveness in ethnography." Others are less optimistic, noting that the results thus far are more programmatic than explicative. Some question not only the techniques of investigation, but also the validity of some of the basic assumptions of the approach. Burling (1964) for example, is concerned with assumptions made about the relationship between linguistic elements and cognitive processes. Harris (1968) feels that the implied stress on informants' verbal statements will lead to idealistic as opposed to realistic descriptions of cultural phenomena. And Berreman (1966) fears that the lure of this new "scientific" method may overshadow the contributions still being made by more traditional approaches.

Despite these criticisms and others (see Kay, 1970), people are continuing to work in the field of formal semantics, to expand and refine its methods and to suggest new applications. Some are concerned with additional linguistic approaches to ethnography (Casagrande and Hale 1967; Perchonock and Werner 1969); others with linguistic approaches to analysis (Buchler and Selby 1968; Friedrich 1970; Tyler 1969b). A few are beginning to look for universal semantic patterns in these new data (Berlin 1972; Berlin and Kay 1969; Berlin, Breedlove and Raven n.d.; Ullmann 1963). Linguists themselves show a renewed interest in developing a theory of formal semantics and in strengthening its position in general linguistic theory (Chafe 1970; Chomsky 1965; Katz and Fodor 1963; Lamb 1964b; 1966; Weinreich 1966). Semantics has again become the focal point for those interested in language as human behavior and in human behavior as catalogued by language.

One of the new areas of research that has been suggested for formal semantics is that of historical studies. Tyler (1969a:18) sees an approach to the reconstruction of meaning through the analysis of the organization of whole semantic domains as of particular importance. He feels that historical linguistics has made little progress in semantic reconstruction because of its preoccupation with linguistic forms and the idea that basic meaning is somehow represented in the most frequently occurring glosses. He cites his own work (Tyler 1965) and that of Voorhees (1959) as indicating that the reconstruction of at least some domains--in this case kinship systems--is possible without reference to constituent morphemes or lexemes (see also Romney 1967). Tyler (1969a:18-19) notes further that the "structure of the rules which transform one genetically related system into another constitutes a description of historical process." And, he adds: "An interesting feature emerging from these studies is that the semantic structure of such systems display [sic] a remarkably conservative nature. The parameters of the system are relatively impervious to change despite the fact that individual lexemes denoting semantic categories frequently undergo rapid and dramatic change" (Tyler 1969a:19).

Tyler's suggestion that semantic systems may have a perceptible time depth and may be amenable to historical analysis is not entirely new. Indo-Europeanists in the last century were concerned with developing "laws" for dealing with semantic change through time (Ullmann 1963:172). These and other comparativists have long noted the tendency for certain sets of related lexical forms to be retained through time while others undergo more rapid change and replacement. Most of the early genetic classifications of languages were based on the assumption that items from core or basic vocabulary areas such as terms for parts of the body, kin relationships, geographic features, etc., would be retained over long periods of time (Fowler 1971; Haas 1969). This same assumption was basic to the development of lexicostatistics and glottochronology as quantitative approaches (Gudschinsky 1956; Swadesh 1951). More recently, Elmendorf (1958; 1962) and Kroeber (1961) have attempted to analyze time depths for related languages while taking into account differential rates of retention for various semantic sets. Elmendorf 1958; 1962) has suggested some specific historical reasons for different replacement rates in the Yukian languages of native California and in Salish dialects of the Northwest Coast.

What is new about Tyler's thesis, however, is the suggestion that the parameters, principles of organization and the semantic components of these systems may also be amenable to historical analysis, perhaps within the framework of culture history or some broader evolutionary scheme. This type of analysis, necessarily comparative, would go beyond discussion of the retention of individual lexemes or lexeme sets and attempt to discover historical roots for the semantic principles that organize these systems. The growth and development of the lexicon for a particular semantic domain could then be viewed as part of the larger, sociocultural system of a particular group or groups of peoples. Its patterns of change could be discussed in terms of the specifics of sociocultural change. This type of approach would allow not only for substantive discoveries about individual systems but also for findings about the nature of semantic systems generally. Particularly, it would help to determine what types of influences are initiating and/or sustaining forces in semantic development. Methodologically, it would have to combine ethnography, historical linguistics and whatever other lines of inquiry were deemed relevant to investigating the particular semantic systems involved.

It is this dynamic aspect of the study of semantic systems that will occupy us here. Specifically, we will attempt to describe the growth and development through time of a particular set of semantic networks that presently occurs among certain of the Numic-speaking Indian groups in western North America. The networks are those surrounding native views of the nature and interrelationships of plants and animals, particularly as these views are expressed in Numic systems of biotaxonomic classification. Through an examination of the ecological, cultural and linguistic features of these systems, we will attempt to show that they have their origins in three sets of factors: 1) in observations of concrete similarities and differences among the naturally occurring biotic forms in this region; 2) in cultural interpretations of the significance of these observations, as expressed in attitudes toward exploitation, but also as at least partially synthesized in mythology; and 3) in certain historical influences that have been operative on these groups for the past 3,000 years. We will further attempt to describe the development of these systems with reference to a particular theory of Numic prehistory, that of Sydney Lamb (1958a), who suggests that these groups are relatively recent migrants into the Intermontane Great Basin, entering the area within the last millennium from somewhere to the south, possibly from near Death Valley, California.

The purposes of this thesis will be thus both substantive and theoretical. They will be substantive in that we will be investigating the history of a particular set of semantic systems in a particular set of languages and cultures. They will be theoretical in that we will attempt to demonstrate the effect of certain specific factors on the growth and development of the Numic ethnobiological systems, and perhaps on ethnobiological systems generally. These factors are environmental contingencies, particular cultural patterns and certain historical circumstances. Numic ethnobiological systems will be viewed as rooted in nature and natural observations, but also as culturally and historically conditioned. We hope that some of the points raised may contribute generally to our understanding of the interrelationships of language, culture and culture history.

B. The Problem

The Great Basin region of western North America offers some rather unique opportunities for testing various hypotheses relative to the history and development of semantic systems, particularly in ethnobiology. In this region, prior to major disruption by Euro-American incursions in the middle of the last century, lived numerous, relatively small and culturally homogeneous, hunting and gathering groups. They have been designated by a variety of names in the historical and anthropological literature, including Northern Paiute, Paviotso, Bannock, Shoshoni, Panamint, Chemehuevi, Southern Paiute, Ute, and a host of others. Their name for themselves derives from the term for "person," or "native speaker," which is variously /nɨmɨ́/,[3] /nɨ́mɨ/ or /nɨŋʷɨ́/, depending on language and area (see Map 1).

In order to survive in the seemingly harsh environments of the semi-arid Great Basin, these people developed a non-specific, or variety oriented, exploitative system, one requiring detailed knowledge of the habits and habitats of

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[3] Transcriptions of native terms in this thesis have the following values: 1) terms given in brackets [], particularly the Northern Paiute, Southern Paiute and Shoshoni field data, are transcribed broadly phonetically, with most translations provided by informants; 2) terms given in slashes / / are transcribed phonemically, following the usages and solutions of the various authors cited; and 3) terms underlined, or segmented by series of dashes are for the most part from older and less reliable works. Their phonetic/phonemic status is questionable.

Study Areas: 1. Reno
2. Pyramid Lake
3. Owyhee
4. Richfield
5. Cedar City
6. Kaibab
7. Las Vegas

MAP 1: GREAT BASIN TRIBAL DISTRIBUTIONS

the numerous biotic forms that are native to the region. This pattern had many similar aspects and foci, so that with a few exceptions, we may describe the area as generally homogeneous as to subsistence base. Variations that did occur can be tied to peculiarities in local environmental conditions and/or to historical circumstances that led to changes in orientation. As the food quest was of primary concern, environmental contingencies also conditioned many other features of culture (Steward 1938).

With one notable exception, i.e. the Washo, Great Basin groups spoke closely related languages, forming the northernmost or Numic branch of the widespread Uto-Aztecan stock. Linguists have suggested that the Numic branch contains six languages, divided into three sub-branches of two languages each. These are designated Western Numic, with languages Mono and Northern Paiute; Central Numic, with languages Panamint and Shoshoni; and Southern Numic, with languages Kawaiisu and Ute (Miller 1966). Phonological, grammatical and lexical differences among the sub-branches and languages are slight, leading linguists to postulate divergence from some parent source at less than 2,000 years ago (Hale 1958-59; Lamb 1958a). Archaeological and linguistic evidence suggests that between this time and ca. A. D. 1,000, speakers of Numic dialects began to expand into the Intermontane Great Basin region. The point of origin for Numic migrations has been variously placed as in the vicinity of Death Valley, in southern California (Lamb 1958a); and generally, Hopkins (1965), southeastern Utah-northern Arizona

(Gunnerson 1962), and an unspecified locality in the northeastern Great Basin (Taylor 1961). The fate of the previous occupants of the region and their relationship to the Numic speakers, if any, has also been the subject of some speculation (see Chapter II, C).

Given the degree of cultural and linguistic homogeneity that exists in the region, as well as specific proposals accounting for its linguistic pre-history, we are able to examine several hypotheses relative to factors influencing the growth and development of Numic ethnobiological systems.

1. By examining the structure of a single domain (ethnobiology) in a number of closely related languages (Numic), we should be able to determine if these semantic systems have any perceptible language specific, or perhaps language branch specific, characteristics. Given the degree of homogeneity among the various languages, we would expect similarities in the structures of systems, as well as the forms themselves.

2. By holding the influences of language relatively constant, i.e. by working with systems in a single Numic language, we should be able to investigate the effects of such non-linguistic features as environmental differences and variations in subsistence orientations on semantic growth and development. If these features are important, we would expect systems within a single language to exhibit variations in line with these various contingencies.

3. By examining all systems in a comparative linguistic framework, we should be able to see the influences of various historical factors, such as the proposed Numic expansion into the Great Basin area, various associations with neighboring groups, etc. We would also expect these factors to influence systems along certain predictable lines, given the present and proposed locations for Numic populations vis-a-vis surrounding groups at various points in time.

4. Lastly, and in part related to point 3 above, given that the data being considered form ecological sets and paradigms, we should be able to use them to better decide the location of a homeland for Proto-Numic. We would expect forms that can be reconstructed as Proto-Numic to give us certain ecological clues to points of origin for this linguistic branch and perhaps others closely related to it.

In order to test these various hypotheses, we conducted field investigations and other comparative studies with Numic-speaking groups in several Great Basin areas. To consider the first question, we gathered taxonomies for plants and animals in three Numic languages, each representing a different Numic sub-branch. These are: Northern Paiute (Western Numic), as spoken at Reno and Pyramid Lake, Nevada; Shoshoni (Central Numic), as spoken at Owyhee, Nevada; and Ute (Southern Numic), as spoken at Las Vegas, Nevada, Cedar City and Richfield, Utah, and Kaibab, Arizona. Findings suggest that there are certain formal similarities between branches and among languages that may have originated in some cognate semantic structures and principles in Proto-

Numic.[4] However, findings also show that language-specific semantic features are difficult to demonstrate conclusively, as they can be easily confused with similarities arising for other reasons; i.e. because of cultural and ecological pressures, and perhaps even because of general evolutionary trends in the ethnobiological vocabulary building. The Numic systems should next be compared to non-Uto-Aztecan systems for groups in similar cultural and ecological settings to establish these language-dependent factors.[5]

In order to examine the second postulate, i.e. the importance of certain non-linguistic factors on taxonomic growth, we investigated structures in the Ute language from groups in several different environmental areas and of different subsistence orientations. These include the Chemehuevi and Las Vegas Southern Paiute groups in the "hot deserts" of southern Nevada, the Cedar City Southern Paiutes in the "cold deserts" of the eastern Great Basin, and the Kaibab Southern Paiutes in the higher elevations of the Colorado Plateau. Indications are that ecology plays a very important role in semantic development in ethnobiology, often

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[4]We here interpret semantics as an integral part of language, capable of being described in at least some aspects by formal analysis (Katz and Fodor 1963; Chafe 1970; Chomsky 1965).

[5]Bright and Bright (1965) attempted a study of this type in certain northern California Indian languages, with somewhat inconclusive results. They found some differences among the Yurok (Algonkian), Karok (Hokan) and Hupa (Athabascan) biotaxonomies, but were uncertain as to the causal factors. They also noted more actual similarities in groupings than differences.

leading to the emergence of specific taxonomic groups, as well as to varying definitions of cognate lexemes in different areas. With reference to the influence of differences in subsistence orientations, we also gathered taxonomies from horticultural (Chemehuevi, Kaibab) and non-horticultural (Cedar City) groups of Ute speakers. These factors are also seen as causing some major realignments in the systems. We thus conclude that Numic systems are highly adapted to local environmental and cultural circumstances.

The remainder of our analysis is concerned with additional comparisons for the historical purposes outlined in points 3 and 4. By comparing the Numic systems with certain others in related languages, we attempt to describe semantic growth as reflected in cognate forms in the lexicon. These comparisons give us some keys to the historical influences that have been operative on Numic speakers since before their suggested expansion into the Great Basin region. Specific lexical comparisons are made between the Northern Paiute, Ute and Shoshoni data collected in the field and materials from the literature on these languages and their sister languages, Mono, Kawaiisu and Panamint. Broader comparisons are also made with certain other northern Uto-Aztecan languages, including Hopi, Tubatulabal, Luiseno, Cupeno, Cahuilla and Serrano. All of these suggest that we can reconstruct certain semantic features of Proto-Numic ethnobiological systems, as well as a substantial portion of the lexicon. They also help to further substantiate origins, bringing into focus certain relationships between languages and branches that have historical implications. Relationships seem particularly close between the Southern Numic languages and Hopi and the Southern Numic languages and Tubatulabal, suggesting that these particular groups may have been in geographic proximity for some time.

As a further consideration of Numic historical problems, we also examine the lexical data derived from these various comparisons for additional clues to possible Proto-Numic environmental features and homelands. Findings from these comparisons seem to add additional strength to proposals for a homeland in southern California, perhaps somewhere near the southern tip of the Sierra Nevada.

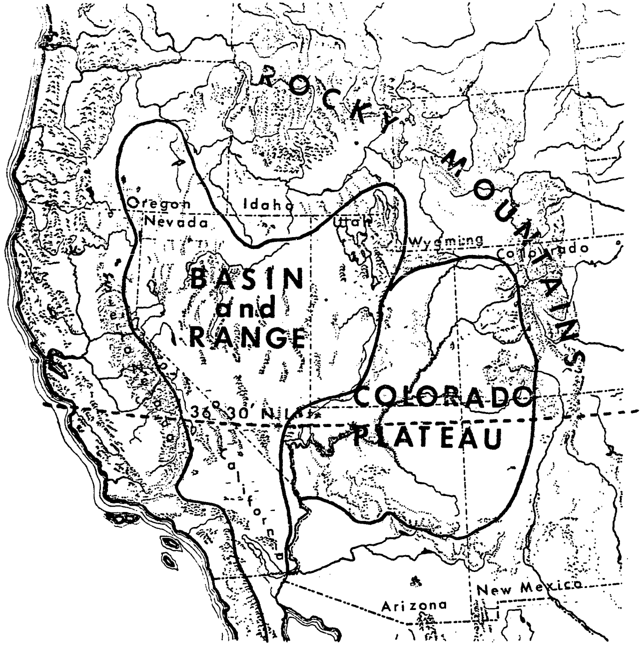
In the chapters to follow, we will examine more thoroughly these various questions as well as the data. Specifically, in Chapter II, we will outline in more detail the pertinent features of the environmental, cultural and linguistic situations in the Numic region, as well as review specific theories of Numic origins. In Chapter III, we will describe the biotaxonomic systems of the Northern Paiute, Shoshoni and Southern Paiute groups tested, noting features relative to the various hypotheses stated above. In Chapter IV, we will review the comparative literature on biotaxonomies and principles of classification for these and the other northern Uto-Aztecan groups of historical concern. In Chapter V, we will attempt to reconstruct as much as possible of the Proto-Numic biotaxonomic nomenclature, tracing the development of certain categories with their lexemes to the present. And, in Chapter VI, we will compare inter-branch cognates for further indications of historical relationships and for evidences of proto-environmental situations and locations. We will also summarize our findings with reference to the utility of semantic studies emphasizing the structural aspects of domains to historical questions and investigations.

II. THE GREAT BASIN

A. The Environmental Setting

The Numic-speaking peoples, at the time of contact and disruption in the early part of the last century, occupied a region of some 400,000 sq. mi. in the semi-arid interior of western North America. This vast region, much of which can be classed as upland or desert steppe, extended from the volcanic plains and plateaus of the Snake River country on the north to the deeply dissected canyons of the Colorado River on the south, and from the mountain chains of the Rockies System on the east to the sharp uplift of the Sierra Nevada on the west. Today, it covers most of the states of Nevada and Utah, as well as portions of Oregon, Idaho, Wyoming, Colorado, Arizona and California (see Map 2).

The western two-thirds of this region, or that formerly occupied by Northern Paiute and Shoshoni groups, falls within the Basin and Range Physiographic Province (Fenneman 1931:326). It is characterized topographically by numerous semi-arid and broad basins, separated by isolated and roughly parallel mountain ranges. The ranges are the result of faulting and folding in the parent strata, generally on a north-south axis. They therefore trend in this direction. The basins between the fault lines have been built up by erosion from the ranges until many have nearly level floors (Plate 1:a, b). Many basins are long, paralleling the ranges for 100 mi. or more (Fenneman 1931:333f).



MAP 2: PHYSIOGRAPHIC AREAS OF THE WESTERN UNITED STATES

In the north, in the so-called Great Basin, the base elevation for basins and ranges is relatively high, ca. 4,000 ft., and the area is characterized by internal drainage. This drainage pattern has resulted in the formation of several permanent and slightly to highly saline lakes, as well as to numerous ephemeral playas or sinks on the basin floors. Lakes such as Pyramid, Winnemucca, Walker, Honey, and Humboldt and Carson sinks in the west, and the Great Salt Lake, Sevier, Utah and Bear lakes in the east, created various biotic communities. The streams that fed them were among the few permanent water courses in the region (Map 2). Many of the playas are filled with runoff water each spring, but dry to hard, alkali pans by mid summer, when precipitation decreases to 1 in. or less per month (Brown 1960). These pans are a striking feature of the region and contribute to the impression that much of the area is true desert (Plate 1:c, d).

In the south, base elevation decreases to 2,000 ft. or less and playas are less common. In isolated cases, e.g., in Death Valley, base elevation dips to below sea level. Also in the south, basins are larger and the intervening mountain ranges less extensive. Some of the water courses in the southern portion enter streams that flow to the sea, while others, because of general features of aridity, evaporate before reaching outlets (Fenneman 1931:326).

In the north, basins and the lower margins of the ranges support various "cold desert" or semi-desert biotic communities. North of 36°30' No. Lat., which traverses southern Nevada and southern Utah (see Map 2), the "shadscale-kangaroo rat-sagebrush biome" occupies much of the region, including portions of the adjacent Colorado Plateau Physiographic Province. Vegetation consists of several types of low-growing shrubs, the most common being big sagebrush (Artemesia tridentata)[6] and shadscale (Atriplex confertifolia) (Shelford 1963:260). Cottonwoods (Populus Fremontii, P. trichocarpa), tules (Scirpus acutus), cattails (Typha latifolia), willows (Salix spp.) and associated species also occur on valley floors along permanent and some intermittent streams and around springs and seeps (Plate 2:a, b).

The slopes of the ranges in this northern area support sparse to dense coniferous growth, depending on conditions. Common species at intermediate elevations include nut pines (Pinus monophylla, in the west; P. edulis in the east) and junipers (Juniperus osteosperma, J. scopulorum), with an understory of sage and grasses (Oryzopsis hymenoides, Elymus spp., Poa spp., Stipa spp.). Other conifer-dominated communities are found at higher elevations. Canyons, especially those with permanent stream flow, support various berry-producing species, including chokecherry (Prunus melanocarpa), elderberry (Sambucus melanocarpa), and currants (Ribes spp.) (Plate 2:c, d).

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[6]Authorities for binomials of plants cited herein may be found in Munz and Keck (1963) and Kearney and Peebles (1960). Those for mammals may be found in Hall and Kelson (1959) and those for birds in Peterson (1961).

Large and small mammals, birds and other forms are found in most of these communities, from the valley floors to the crests of the ranges. Population density for fauna is somewhat low in comparison to some other areas of North America, although speciation is high (Hall 1946). Rodents, rabbits, hares and lizards are most abundant on valley floors, while at higher elevations, larger forms are more common.

In the south, in extreme southern Nevada and portions of Utah, southern California and Arizona, basins and ranges support more heat- and draught-resistant species, typical of "hot desert" areas (Shelford 1963:373). Cacti, yuccas and related forms are more common, and creosote (Larrea divaricata), mesquite (Prosopis juliflora), boxthorns (Lycium spp.) and other forms dominate (Plate 3:a, b). Clumps of cottonwoods (Populus Fremontii) and desert willows (Chilopsis linearis) occur adjacent to springs and seeps, and salt marshes support a variety of other forms. Large mammals are rare except at higher elevations. Many of the smaller mammals, particularly rodents, are nocturnal (Shelford 1963:373f).

The eastern third of the Numic region, or that formerly occupied by Southern Paiute and Ute groups, is part of the larger Colorado Plateau Physiographic Province (see Map 2). The province as a whole is characterized by nearly horizontal sedimentary strata rising from a base elevation of 5,000 ft. Unlike the neighboring Basin and Range where strata are folded, tilted beds here occur only in a few great monoclines and at the borders of local uplifts. Also, unlike the contiguous Basin region, the results of erosion here are steepness rather than leveling, brought about largely because of the strength of the parent strata (Fenneman 1931:274).

Within this region are hundreds of step-walled canyons. These have been cut into the sedimentary strata largely by stream action. The largest of the canyons is formed by the Colorado River and its main tributary streams, the Green and San Juan. From these, side canyons occur in every direction and range in depth from a few hundred feet to well over 1,000 ft. Many of these canyons are so steep that access to water and stream-side flora and fauna is severely limited. In the main stem of the Colorado itself, Cataract, Glen, Marble and Grand canyons cut most deeply. The Grand Canyon reaches a depth of 6,000 ft. from the surrounding plateaus and a lateral extension at the top of more than 15 mi. (Fenneman 1931:286).

In addition to canyon lands, many of which support only sparse vegetation and limited animal life typical of both "cold" and "hot" desert areas, this region is also characterized by numerous and more luxuriant plateaus. Some of these have been isolated by stream erosion, canyon formation and minor faulting. Others rise steeply from the surrounding level plain as a result of major faulting. In the central portion of the area, in Utah and northern Arizona, faulting in the sedimentary layers has been so marked that a series of "high plateaus" has been produced, rising as much as 5,000 ft. from the floor of the surrounding country. Subsequent faulting has cut these plateaus in several directions and caused them to dip to the north so that their exposed escarpments form a series of giant stairs from the rim of the Colorado River canyon toward the north. These "high plateaus" are usually well-watered and support numerous biotic communities typical of woodland and brushland areas. Common dominants are, again, pinyon (Pinus edulis) and juniper (Juniperus osteosperma, J. scopulorum), as well as mountain mahogany (Cercocarpus spp.), manzanita (Ceanothus spp.) and oak (Quercus gambelii). True coniferous zones with ponderosa pine (Pinus ponderosa), aspen (Populus tremuloides) and other species are also found throughout (Plate 4:a).

Plateaus not within the "high plateaus" system rise table-like from the surrounding country and occur at all altitudes from 5,000 ft. to well over 11,000 ft. (Fenneman 1931:299). These are generally less well-watered, except for the highest, and have some areas of exposed rock and poor soil development. Many areas in the canyonlands generally are characterized by expanses of "slick rock," almost barren of vegetation and animal life. Even within the canyonlands, however, stream-side communities of cottonwoods, willows, oaks and other forms are well developed. They shelter deer, beaver, foxes and numerous smaller mammals (Plate 4:b, c).

Fringing Numic territory on all but its southern side are major mountain chains, all of which were frequented by Numic groups in the pre-contact period. These contribute to the overall character of the region and particularly to its aridity, as they prevent moisture-laden storms from reaching much of the area. In the north and on the east, the Rocky Mountain System forms one of the major physiographic features of all of North America. It consists of vast, closely-spaced chains of mountain ranges, plateaus and parks that together form a wide, high and continuous ridge from western Canada southward across the states of Montana, Idaho, Wyoming, Colorado and New Mexico. The mountainous barrier separates the Great Plains on the east from the Colorado Plateau, Basin and Range and other areas on the west. The mountains range in elevation from 8,000 to 10,000 ft. in the north and south, while attaining heights of 13,000 ft. and above in the central area in Colorado (Fenneman 1931:93). Structurally the ranges are great anticlines that have been heavily eroded by glacial action. They are often steep and rugged, and contain numerous areas of exposed rock. They support many different biotic communities from base to crest. Common dominants at higher elevations are Engelmann spruce (*Picea engelmanni*), subalpine fir (*Abies lasiocarpa*), bristlecone pine (*Pinus aristata*), limber pine (*P. flexilis*), lodgepole pine (*P. concorta*) with an understory of dwarf bilberry (*Vaccinium caespitosum*), black currant (*Ribes lacustre*), soapberry (*Shepherdia canadensis*), willow (*Salix nuttallii*) and others (Shelford 1963:164).

Within the central and southern sections, there are also large parks, or open, nearly treeless depressions between the mountain chains. The largest of these are North, Middle and South Parks in Colorado, once favorite summer headquarters for various Ute groups. North Park covers nearly 1,000 sq. mi. and has a base elevation of 8,000 ft. (Fenneman 1931:126). The other large parks are similar in extent and elevation. In addition to these, there are numerous smaller parks, scattered throughout the Rockies, most of which are relatively flat meadowlands, flanked by timbered foothills and peaks. They are generally well watered by the surrounding ranges and frequented by many types of game animals.

The western border of Numic aboriginal territory is formed by the great Sierra Nevada chain and extensions of the Cascade Range. Together, these form a single mountainous area that separates the Pacific valleys from the Great Basin. This great chain is approximately 1,000 mi. long and averages 50 mi. to 60 mi. in width. The general crest height is variable, with peaks in the southern Sierra rising to 12,000 and 14,000 ft. The elevation of the mountain chain from the floor of the adjacent Basin and Range averages from 2,000 to 5,000 ft. in the north, especially in Oregon and northern California, and from 5,000 to 10,000 ft. in the south, in western Nevada and parts of southern California (Fenneman 1931:396). The western slopes of the Sierra-Cascade support luxuriant mixed coniferous and deciduous forests and a wide variety of animal species. The eastern slopes tend to be drier, as they are within the rain shadow of the mountains (Brown 1960), and fewer life forms occur. Jeffrey pine (Pinus jeffreyi), whitebark pine (Pinus albicaulis), and aspen (Populus tremuloides) are common, with manzanita (Arctostaphylos spp.), mountain mahogany (Cercocarpus ledefolius), ceanothus (Ceanothus spp.) and other forms found in association. Oaks (Quercus spp.), especially the larger varieties, are rare to absent on the eastern slopes. Those that do occur are largely confined to the southern part of the range.

As can be seen from the foregoing brief treatment, the environmental situations against which the Numic peoples adapted their technological and other skills were many, and they varied across the region. Basins and adjacent ranges, plains and plateaus, mountains and meadows all offered different and somewhat unique opportunities for resource exploitation, often within a lateral extent of a few miles. Microhabitats, such as specific stream sides, marshes, canyons, lakesides and others provided by the vertical relief were all important, and contributed to diverse patterns. Overall similarities in major biome formations, however, led to some commonalities. Everywhere, variety was a key characteristic, and an orientation to the varied conditions became one of the hallmarks of Numic culture.

B. The Cultural Setting

Numic culture for the immediate pre-contact and post-contact periods has been fairly well described by several writers (d'Azevedo, et al. 1966; Harris 1940; Kelly 1932; 1964; Lowie 1909; 1924; Opler 1940; Steward 1933; 1938; 1955; 1970). All agree that the Numic speakers shared a general cultural pattern based on hunting and gathering the diverse natural food resources that occur in the region. The pattern described is similar to that termed "Archaic" by archaeologists, and it is one that has been characteristic of western

North America for the last 10,000 years (Jennings 1964).

Numic groups exploited the region for food with a minimum of organization and a simple yet efficient technology. Their basic exploitive unit was a relatively small, quite mobile and almost universally bilateral kin group. It was most frequently the same as the habitual residence unit, which has been defined variously as a nuclear family (Steward 1938:239), a camp group (Harris 1940:46), or a kin clique (Fowler 1966:62). The latter concept is perhaps the most expressive of the overall situation.

The exact size, make-up and the degree of inner- and intra-group cooperation of kin cliques varied from area to area, from season to season and from task to task. No one unit size or composition was really "typical" of the entire Numic region except perhaps in an areal or seasonal sense. Most groups underwent processes of almost continual fission and fusion. True nuclear family units, consisting of father, mother, children and perhaps a grandparent or two, foraged separately during some seasons, but were joined by other families for communal hunts, occasional harvests with associated festivities and winter camps. This pattern was particularly common in the central Great Basin where Steward (1938; 1955) has described the "socially fragmenting effect" of the environment on certain Northern Paiute, Shoshoni and Southern Paiute groups. Plant and animal resources here were particularly varied and scattered so that small, mobile family clusters were highly efficient as exploitative units. Furthermore, gathering seeds, roots, berries and other plants and hunting most of the small and large animals in the region did not require cooperative efforts--given Numic technology. Only antelope, mountain sheep, rabbits, mudhens and occasionally deer were taken by communal efforts. Reasons for so doing varied from animal to animal, but most depended on observations of particular habits. Drives involving several family units were conducted when and where the populations of these species were sufficient.

In other areas of the region, and particularly where local resources were relatively abundant, larger camp groups, small villages, and, in more recent times, horse-using bands were also found. In Owens Valley (California), Reese River Valley (Nevada) and select other locations, larger groups were able to sustain themselves for longer periods and develop semi-permanent villages. In Owens Valley, resources were sufficient to allow families to supply their subsistence needs within a radius of a few miles from a fixed village site. This was brought about by the immediate proximity of mountain ranges on both east and west (the White Mountains and the Sierra Nevada, respectively), as well as conditions in the lush valley itself. Numerous biotic communities with exploitable resources occurred throughout the area. Villages of 100 to 300 persons were located in Owens Valley on the banks of permanent streams and near irrigated wild seed patches (Steward 1930; 1933:247).

There were also semi-permanent villages in the Reese River Valley in central Nevada, another well-watered area and one with a "vertical" concentration of biotic communities.

The Reese River Shoshoni groups also supplemented their food supply by broadcast-sowing wild seeds, as did a few other central Basin groups (Steward 1938:104; Downs 1966).

In the south, Southern Paiute camp groups of 3 to 10 families, either related or "friends," foraged separately or together from fixed sites at springs and along water courses. Kelly (1964) has noted the patrilocal tendency of some of these groupings, particularly for the Kaibab Southern Paiute. Among the Kaibab, a father and his sons and their families, or siblings (usually brothers) and their families often camped together. Some Southern Paiute and Chemehuevi groups, especially those located at large springs or along the Colorado River and its tributaries, tended small garden plots of Southwestern cultigens--a practice they may have learned from the Hopi, Pais or other Yumans to the south or west (Kelly 1964). Tending fields did not necessarily restrict their movements, however, as they frequently left their camps, returning only periodically to check and water the crops until harvest time.

In the north and east, in Northern Paiute, Shoshoni and Ute territories, the spread of horses and horse culture in the immediate pre-contact period made larger groupings possible. As Steward (1938:48) has noted, the post-horse "bands" that developed in these areas were not the result of greater population density, but of increased mobility provided by the horse. Larger units were able to exploit more territory for food resources on horseback, and thus remain together. Mobility was also an artifact of horse culture here as on the Plains (see Oliver 1962). In order to provide forage and water for their animals, Northern Paiute, Shoshoni, Bannock and Ute bands were almost continually on the move (Murphy and Murphy 1960). The predatory aspect of some of the Northern Paiute mounted bands may have developed in the post-contact period as yet a further adjustment in the subsistence cycle. Natural resources were severely depleted in many areas of western Nevada in the post 1850's (Steward and Voegelin 1954).

Relative autonomy of localized groups in much of Numic territory resulted from a combination of social and environmental pressures as well as from the rather loose system of political control (Steward 1938). Leadership in much of the region was confined to persons of influence rather than authority, and tended to operate only within the particular residence unit involved. Among most groups, local headmen would give advice, occasionally direct daily subsistence activities and, even less frequently, act as arbiters in intra-familial disputes. They rarely imposed decisions on the parties involved, however (Steward 1938).

From time to time, especially in the central Basin area, other persons would be called upon to take charge of communal subsistence efforts, such as rabbit or mudhen drives, antelope hunts, etc. Such individuals were chosen for a variety of reasons, including hunting and organizing abilities, luck, power with the particular species involved, or, as in the case of rabbit drives, because they owned large rabbit nets. These were temporary leaders for "task groups"

(Anastasio 1955) who, depending on conditions may or may not be chosen in another year or for another event.

Somewhat more complex leadership patterns were found among the mounted bands where persons exercised more authority. Some Northern Paiute, Northern Shoshoni and most Ute bands in the immediate pre-contact and post-contact periods had leaders who, in turn, had spokesmen to convey their messages to the people. Alliances within the band even in these cases remained somewhat fragile. Persons left the group when the leader could no longer command respect or when personal disagreements resulted (Murphy and Murphy 1960). Steward and Voegelin (1954) maintain that leadership among most of these mounted groups was a post-contact phenomenon, brought about by white pressures for spokesmen.

In many areas of the region, and especially where residence units were small, as in the central Great Basin, networks of kin relationships were created as an artifact of marriage patterns. Prohibitions for marriage were commonly extended to all blood relatives (Steward 1938). This often required people to look beyond the local group or area for marriage partners, as suitable individuals were usually not available in the small kin based residence groups. Communal hunts, harvests and the associated festivities and other occasions provided good opportunities to meet persons from other areas. Kin networks functioned in times when local resources failed to extend hunting and gathering privileges, possibly as an aspect of patterns of intra- and inter-familial sharing. These networks often crossed dialect and even language boundaries (Miller 1970 ; Steward 1938; 1970).

Exceptions to the extension of marriage prohibitions to cousins existed in several Great Basin areas. Cross-cousin marriage was preferred among the Gosiute and some other Shoshoni and Northern Paiute groups. It has been reported by Steward (1938:140) as perhaps preferentially patrilateral among the Skull Valley Gosiute. Pseudo cross-cousin marriage, or marriage with father's sister's or mother's brother's stepchild, has also been reported as an alternative arrangement, as has brother-sister to sister-brother exchange. In some Northern Paiute and Shoshoni groups, pseudo cross-cousin marriage was permitted while marriage between real cross-cousins was prohibited. Pseudo cross-cousin marriage also had a patri bias in some areas (Steward 1938:194, 245).

Post-marital residence and descent patterns for the region have been the subjects of renewed interest in recent years. According to Steward (1938; 1970), all Numic groups were bilateral, but residence patterns varied. There was an idea of initial matrilocality as a form of bride service among many Western Shoshoni and some Northern Paiute groups (see also Park 1937). This was probably the result of the relative importance of women in subsistence pursuits. After this period, but occasionally not until after the birth of the first child, the couple was free to choose a residence site, either a new one or one with either set of parents. Individual preferences, personalities, resource availability, and other factors influenced these decisions (Steward 1938: 243). Residence ties may also have changed several times throughout a person's lifetime. This factor also fostered a variety of extra-group contacts.

Service (1962:94-9) and Owen (1965) oppose Steward's views on residence and descent, claiming that the Numic groups in the pre-contact period were probably patrilineal and patrilocal. Service feels that the patterns obtained by Steward represent the post-contact disintegration of patrilineal-patrilocal conditions. He cites various types of evidence, including Steward's own data on cross-cousin marriage, historical descriptions of territorially based "bands," etc., to support his position. He sees patrilineal-patrilocal band organization as characteristic of hunting and gathering populations in relatively harsh environments in other areas of the world, and thus postulates the early dominance of this type of organization in evolutionary perspective. Owen's (1965) position is derived in part from that of Service, but he also stresses that such situations tend to produce culturally and linguistically hybrid groups, a point even Steward (1965) feels is worth pursuing, and one to which we will return in the section on languages, below.

Fowler (1966:67f) has reviewed Service's position and criticized it, particularly in terms of Service's use of the historical literature. He concludes that Service's contentions cannot be demonstrated, at least from the sources he cites. Steward (1970) has also answered Service at some length, restating his position on residence and descent among the Numic peoples. He recognizes the complexities in the region, but still feels that his data reflect the pre-contact situation and are in line with the environmental contingencies of the region. The issue should probably not be further debated here, except to note that, given all of the evidence, Steward's position seems the most readily defensible. However, the important point is that the varied character of the social situation, no matter what its ultimate basis, may have had some important influences on the development and maintenance of linguistic relationships in the region.

C. The Linguistic Setting

Lamb (1964a) has recently reviewed the history of the development of a classification for the Uto-Aztecan languages, including the Numic family. Lamb (1964a), Miller (1966) and Goss (1968) have also evaluated the present status of that classification, including speculation on its inner- and intra-stock relationships. All three are in substantial agreement that Uto-Aztecan has a number of distinct families or branches. These are (after Lamb 1964:109-110): Numic, Tubatulabalic, Luisenic [or Takic (Miller 1964)], Hopic, Pimic, Coric, Aztecic, Taracahitic [Miller (1966) lists Tarahumaric and Cahitic separately], and Giaminic (listed as separate only by Lamb) (see Map 3). Each is seen as an independent unit, although possibilities of genetic connections at a supra-branch level have not been ruled out [see Voegelin, Voegelin and Hale (1962) for proposals relative to Sonoran, Shoshonean and Aztec supra-branches, and Miller (1966) for evaluation].

MAP 3: LINGUISTIC DISTRIBUTIONS: NUMIC, TUBATULABALIC, HOPIC, TAKIC, PIMIC

The Numic branch or family is the northernmost Uto-Aztecan grouping, and is confined to the Great Basin region and its immediate vicinity. It has three main subdivisions, each with two languages. The names for the subdivisions and the languages have changed through time, beginning with the early terminological proposal made by Kroeber (1907) and continuing to the current systems proposed by Lamb (1964a) and Miller (1966). At present, Miller's terminology seems to be gaining favor (see also Goss 1966; 1968) and it will be followed here. Miller designates the subdivisions of Numic with geographic reference as Western, Central, and Southern.

Western Numic contains two languages, Mono and Northern Paiute. Of the two, Northern Paiute covers the largest geographical area. It was, and still is, spoken by people from the Mono Lake basin in southern California through western Nevada and into eastern Oregon and western Idaho. The people known historically as Bannock, now resident at Fort Hall, Idaho, but who once ranged from eastern Oregon to western Wyoming (Stewart 1970), are Northern Paiute speakers. Mono is confined to the area of Owens Valley, California, and its immediate vicinity and to a small area on the western slope of the adjacent Sierra Nevada (see Map 3). The Owens Valley Paiute are Mono rather than Northern Paiute speakers.

Liljeblad (1966) sets up two primary dialects for the Northern Paiute language: a northern dialect and a southern dialect. He places the isogloss separating the two between the Pyramid Lake and Walker River areas in Nevada (see Map 3). Speakers of the northern dialect are now found at Pyramid Lake, Summit Lake, Fort McDermitt and Miller Creek (Owyhee) reserves in Nevada, at Fort Bidwell and Susanville, in California, at Burns and Warm Springs, in Oregon, and at Fort Hall, in Idaho (Bannock). Speakers of the southern dialect are found at Walker River, Fallon and Coleville, in Nevada, and as far south as Bridgeport and Lee Vining in California, where they are in contact with Mono speakers. Liljeblad distinguishes these two dialects on differences in lexicon, some features of grammar and on the presence in the southern dialect of an additional subset of consonant phonemes. In addition to the fortis/lenis contrast in consonants characteristic of all of Northern Paiute (and most of the other Numic languages as well), the southern dialect has both a voiced and voiceless subseries within the fortis stops (Liljeblad 1966:22). In addition to these two primary dialect areas within Northern Paiute, Liljeblad also recognizes a number of sub-dialects localized in different geographic areas.

Lamb (1958b) classifies the Mono or Monache language into three "superdialects," comprised of seven dialects. These are: A. The Northwestern Mono superdialect, including the San Juaquin and Kings River dialects, each of which in turn has two subdialects; B. The Northeastern superdialect, with three dialects, two in the northern part of the area drained by the Owens River and the other in the east in Deep Springs and Fish Lake valleys; and C. The Southern superdialect, with two dialects, one extending from Big Pine southward to Owens Lake and the other centering in the Kaweah

River drainage. Lamb (1958b:15) adds that "it is safe to say that mutual intelligibility prevailed between any two points in the area, although a good deal of difficulty in understanding could be encountered between speakers from widely separated points."

The Southern Numic sub-branch also has two languages, Kawaiisu and Ute. Kawaiisu, like Mono, was confined at the time of contact to a relatively small geographic area, while Ute spanned a very large one. Kawaiisu was, and still is, spoken by peoples at the southern tip of the Sierra Nevada and its immediate environs. Its characteristics are poorly known at present (Klein 1959; n.d.; Zigmond n.d.). Ute extended from the deserts of southern California and Nevada across much of southern Utah and Arizona north of the Grand Canyon into western Colorado. It is still spoken by people from various reservations and colonies throughout that area. The Chemehuevi and various cultural subunits known as the Southern Paiute are Ute speakers.

Goss (1966; 1968) has made some preliminary inquiries into Ute dialectology. He sets up four dialect areas within the Ute language (including the Ute and Southern Paiute cultural divisions). These are: Northern Ute, Southern Ute, Kaibab (Southern Paiute) and Chemehuevi. He provides the following summary (Goss 1968:19):

> Limited comparative work seems to indicate that the Ute-Southern Paiute-Chemehuevi dialects are all very closely knit. Kawaiisu to the west seems to be markedly different, both phonologically and grammatically, than even its closest Yutish neighbor, Chemehuevi. The structural differences of Kawaiisu seem to show structural affinities to

> Tubatulabal. Southern Ute, at the eastern extreme of Yutish distribution shares features of phonology with the neighboring Shoshonish Comanche. Within the Ute-Southern Paiute-Chemehuevi continuum the relationship may be very complex, rather than uni-directional. Northern Ute and Kaibab (Southern Paiute) may have been closer to one another than Northern Ute and Southern Ute, sometime in the past. The linguistic situation may be at variance with the cultural situation.

Goss sets up the Kaibab and Chemehuevi dialects within Southern Paiute admittedly on limited evidence. Sapir (1940) worked only with Kaibab, and there is little available on Chemehuevi (Hill 1969; Kroeber 1907) and even less on other Southern Paiute groups. My limited inquiries in several Southern Paiute areas tend to substantiate Goss's differentiation of Chemehuevi and Kaibab. I would tentatively include within Chemehuevi the Las Vegas Southern Paiute, but leave the question of Moapa affiliations open for the present. There are also some differences in phonology within cognate terms between Kaibab and the Cedar City area, and others between Cedar City and the Richfield area. The people now resident at Richfield, Utah, and formerly on the Koosheram Reservation, have always been difficult to place culturally (Kelly 1938; Euler 1966). The area is best described as a mixed one, perhaps a buffer zone between Pavant and other central Ute and Southern Paiute.[7] Evidence now at hand may

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[7]Aboriginal differences between Ute and Southern Paiute hinged largely on the former's use of horses and adaptations to Plains culture, while the latter continued more traditional hunting and gathering pursuits. Individuals are uncertain about linguistic differences at this point in time. People in Cedar City say that those at Richfield and Koosheram are "more like Utes," but suggest that differ-

warrant setting up a Cedar City dialect area, possibly a second for the central Ute-Southern Paiute hinterland, and perhaps others. Since several of the precontact "bands" described by Kelly (1938) are now extinct, we will probably never be sure of the early dialect patterns.

There is little published work on the Kawaiisu language (Kroeber 1907; Klein 1959), so that dialect determinations within this grouping are difficult to make. Zigmond (1938:635), in a footnote to his brief description of Kawaiisu territorial boundaries, indicates that there are dialect variants for some of the terms he recorded, but does not locate dialect groups within the area. Klein (1959) makes no mention of dialects. Both Klein's (n.d.) and Zigmond's (n.d.) linguistic field notes are as yet unpublished, although Zigmond is in the process of preparing some of his data for publication (Maurice L. Zigmond, personal communication, 1970).

Both the language and the dialect situation within Central Numic has been open to question for some time, primarily for lack of data. Lamb (1958a), admittedly on scant evidence, proposed that there were two languages within this unit, Panamint and Shoshoni, and that their geographic distribution paralleled that of Western and Southern Numic, i.e. one language, Panamint, being confined to a small area in southern California near Panamint and Death valleys, while

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ences are slight. Intermarriage and attendance at common dances, funerals, etc., is common.

the other, Shoshoni, extended from just north of that area through eastern Nevada, adjacent western Utah, into Idaho and western Wyoming. Miller, Tanner and Foley (1971), on the basis of a recent survey of Shoshoni dialects, tend to agree with Lamb on the question of the independence of Panamint, but they also note that the differences between the two languages are slight. They describe a dialect continuum with few perceptible breaks from the Panamint country to western Wyoming. The Comanche, who in historic times occupied an area of the southern High Plains, are Shoshoni speakers who moved from the northern Basin region sometime around 1700 A.D. (Casagrande 1954:142). They are the only Shoshoni group evidencing a sharp dialect break. However, the difference between Comanche and Wind River Shoshoni is no greater than that between Wind River Shoshoni and some Shoshoni areas in Nevada (Miller, Tanner and Foley 1971).

In 1958, applying Edward Sapir's (1916) classic Time Perspective . . . model, Sydney Lamb (1958a) proposed that the Numic speakers intruded into the Great Basin region in relatively recent times. He placed the geographic center of gravity for their dispersion as somewhere in the vicinity of Death Valley, California. He cited the following to support his contentions: 1) the distribution and geographic extent of the languages, with Mono, Panamint and Kawaiisu all occupying small areas in close proximity to each other, while the other three, Northern Paiute, Shoshoni and Ute spread over vast areas (see Map 3); 2) the little perceived dialect diversity in Northern Paiute, Shoshoni and Ute as compared to their sister languages; 3) the close proximity to this geographic center of Tubatulabal, the closest linguistic relative of Numic [the Takic languages, also closely related, are nearby as well (see Map 3)]; 4) lexicostatistic counts that seem to show a divergence of Numic from Tubatulabalic at about 3,000 years ago, and the break-up of Numic about one millennium later; and 5) further counts that indicate the internal divergence of the northernmost languages of the three Numic sub-branches (Northern Paiute, Shoshoni and Ute) from the others at about 1,000 years ago.

Lamb (1958a:99) describes the situation in terms of the gradual divergence of dialects rather than any sharp cleavages. He postulates that around 5,000 years ago, Proto-Uto-Aztecan was beginning to separate into a number of dialects, perhaps somewhere near the Arizona-Sonora border. Those that moved north began to further diverge about 3,000 years ago. Among these were Numic and Tubatulabalic. He feels that before the split of Tubatulabalic and Numic, Numic may have already shown some internal dialect differences, so that the area near Death Valley at about 3,000 years ago may have had for a time a set of mutually influencing dialects. By about 1 A.D., three Numic dialects or languages were distinct, but still occupying an area in close proximity. One of these, Proto-Kawaiisu-Ute (Southern Numic), may have remained under the influence of Tubatulabal for a slightly longer period. Later, and for some unknown reason, the three Numic groups began to spread northward, apparently independently, until they came to occupy their present positions.

He dates this spread at about 1,000 years ago, but states that linguistics apparently does not provide clues as to why it occurred. He does suggest that perhaps the distribution of bison, shown by Steward (1938:37) as extending into the Great Basin, may have provided the impetus.

Lamb's interpretation has been supported by several of his colleagues (Goss 1968; Hopkins 1965; Jacobsen 1966; 1968; Miller 1966). Taylor (1961) and Gunnerson (1962), both archaeologists, have argued against this view from perspectives that attempt to account for Great Basin linguistic prehistory to a greater time depth. Taylor (1961) wants to see Uto-Aztecan and particularly Numic dispersions as coming from the north rather than the south. He suggests that prior to 5,500 years ago, the Great Basin and much of the West and Southwest, were occupied by Hokaltecan (Hokan-Coahuiltecan) speakers. After this time, a period Taylor sees as roughly paralleling the internal divergence of Hokaltecan, he further suggests that the proposed Hokaltecan distribution was broken by intrusions of Penutian and Uto-Aztecan speakers from the north. He sees present Numic distributions as the result of a later divergence within an enclave of Uto-Aztecan speakers that remained in the northeast. Taylor (1961:78) adds:

> I can see no more reasons to propose Death Valley as the homeland for Numic divergence, on the sole grounds of multiplicity of present-day languages, than to identify, for example, the British Isles as a homeland of the Celtic languages! We know that Celtic-speaking peoples of the British Isles represent a pile-up at the end of a long migration--why not California Numic?

Had geographic distributions been the sole basis on which Lamb (1958a) made his proposal, Taylor's observations with reference to Numic might have had more validity. However, as Miller (1966) correctly notes, the dialect distributions for Numic argue against any theory of pile-up in the south. Miller (1966:92-93) observes:

> If the Numic moved down from the North they would have had to be gathered in a wide arc from southern Idaho to central Colorado. Then they would have moved simultaneously in the direction of Death Valley as though they were taking part in a gigantic rabbit surround. As they funneled into the southwest corner, it would have taken careful planning for placing the dialects so as to avoid a pile-up. It is unlikely that the Basin saw such carefully planned migrations until the days of Brigham Young.

Gunnerson (1962) also an archaeologist, attempts to account for Great Basin linguistic prehistory by tying some specific archaeological complexes to the various Numic subbranches. Specifically, he (1962:44) suggests that at about 550 B.C., Proto-Numic speakers arrived in the northern drainages of the Colorado River, in what is now southwestern Utah, northwestern Arizona and southeastern Nevada. There they developed _in situ_ the Virgin Branch of the Anasazi or Pueblo tradition. At about A.D. 950, they began a general expansion to the north and east, with Proto-Southern Numic developing into the Fremont culture of northeastern Utah, Proto-Central Numic developing into the Sevier culture and Proto-Western Numic remaining in the Virgin Branch homeland. Gunnerson (1962:44) suggests that post A.D. 1200, all groups gave up horticulture because of environmental contingencies (draught) and returned to hunting and gathering. They then continued to migrate and expand primarily to the north and west until they reached their present locations.

Schroeder (1963), Euler (1964) and Fowler (1965) have all answered Gunnerson, suggesting that his interpretations are not in line with the archaeological evidence. Their views tend also to support Lamb's hypothesis, and they cite data from excavations as evidences of in-migrations into the Anasazi region rather than cultural degeneration of indigenous practices. More recent archaeological work seems also to be supportive, noting hiatus periods in the archaeological record from A.D. 1200-1400 in such widely separated Great Basin areas as in northwestern Nevada, in cave sites within historic Northern Paiute territory (Donald Tuohy, personal communication, 1971) and in southeastern Nevada, in rock-shelter sites within historic Southern Paiute territory (Fowler, Madsen and Hattori 1972). Artifacts above these levels in both areas have been identified as Northern Paiute and Southern Paiute, respectively.

Thus, the two leading alternative proposals to Lamb's (1958a) southern California homelands thesis have been subject to considerable criticism. However, they remain as possible, although unlikely, suggestions as to origin points for Numic dispersals. However, before we can apply our comparative data to this and other questions of history, one additional point with reference to the Numic linguistic situation needs to be further emphasized. It involves the possible influence of the Numic cultural situation on communicative interchange.

As noted above, Lamb (1958a) bases some of his claims to the relative recency of Numic dispersals on the little observable dialect diversity in Northern Paiute, Shoshoni and Ute today. Owen (1965) and Miller (1970) have both suggested that this feature may have been influenced by the linguistically and socially hybrid character of Numic groups. Communicative interchange, marriage and economic patterns may well have led to some leveling of differences, at least in vocabulary. Opportunities for lexical borrowing are everywhere apparent. Miller (1970) also reminds us that the Numic situation may be an important example of Swadesh's (1959) "mesh principle," characterized by many intergradations lexical, phonological and grammatical features rather than by sharp cleavages. Much of the data we will present in later chapters support these conclusions.

However, before we can return to this discussion which is also pertinent to the history of Numic biotaxonomic systems, we must first examine the data on classifications in some detail. In Chapter III, we present the Northern Paiute, Shoshoni and Southern Paiute plant and animal taxonomies, and test various of our hypotheses concerning semantic growth and development in these areas.

III. NORTHERN PAIUTE, SHOSHONI AND SOUTHERN PAIUTE BIOTAXONOMIES

A. Introduction

The biotaxonomic classifications presented in this chapter were elicited from speakers representing each of the three sub-branches of Numic: Western, Central and Southern. They have been drawn from one language within each of these three, in such a way as to test the environmental, cultural and historical postulates stated in Chapter I. In each case, we attempted to work with speakers who had lived in the particular areas of concern for long periods of time, and who were, as near as can now be determined, descendants of the original inhabitants. However, whether their materials represent pre-contact and immediate post-contact linguistic and cultural conditions is difficult to determine with certainty at this point in time.

Materials are from the following languages and areas: 1) For Western Numic, data were elicited from speakers of the "northern dialect" of Northern Paiute (Liljeblad 1966), as spoken at Pyramid Lake and at Reno, in west-central Nevada.[8] Environmentally, this is a Great Basin "cold desert" area, but one near the eastern slope of the Sierra

[8]The Reno area is on the border between Liljeblad's (1966) "northern" and "southern" dialects, so that all forms recorded cannot be strictly placed in one or the other. Terms recorded with geminated voiced stops fit most closely the patterns of the "southern" dialect.

Nevada. A discussion of the Northern Paiute data, along with some methodological comments, has already appeared (Fowler and Leland 1967). 2) For Central Numic, data are from Shoshoni speakers at Owyhee, Nevada, a higher "cold desert" region, and one further to the north than the Pyramid Lake Northern Paiute area. 3) For Southern Numic, taxonomies are from three different dialect areas within the Ute language, all representing the Southern Paiute cultural division. These are: a) from Southern Paiutes near Cedar City, Utah, who live between the "cold deserts" of the eastern Great Basin and the western high plateaus of Utah; b) from Kaibab Southern Paiutes at Moccasin, Arizona, who formerly occupied the high plateaus and canyon lands of northern Arizona and who still frequent these areas on occasion; and c) from Chemehuevi-Las Vegas Southern Paiutes at Las Vegas, Nevada, who live in "hot desert" country and who once ranged through parts of the southern Great Basin and along the margins of the lower Colorado River. Ancestors of the latter two groups, i.e., the Kaibab and the Chemehuevi and Las Vegas peoples, were horticultural in the immediate pre-contact period (see Chapter II). Cultural and environmental differences, as possible influences on taxonomies, should be maximized within this particular set (see Map 1 for above locations).

B. Methods

The Numic biotaxonomies were elicited according to some of the suggestions made by ethnoscience methodologists as well as through other approaches. The technique of gathering "folk definitions" of important forms as described by Casagrande and Hale (1967) was particularly useful, as was eliciting longer native language and English texts. Some of the techniques of formal "frame analysis," however, posed certain problems. These may be related, in part, to some specific language influences.

Formal "frame analysis," at least of the type described by Conklin (1962), Frake (1962) and Metzger and Williams (1966) is based on principles of class inclusion vs. exclusion. As such, it is basically taxonomic; i.e., phenomena can be described in terms of a classical taxonomic tree diagram, in which forms (in this case, lexical items) at any one level can be said to be mutually exclusive, or contrastive, while those at different levels can be said to include each other in a hierarchy of relationships. Techniques for arriving at taxonomic trees include questions of the type "Is X a 'kind of' Y?" and, if so, "What other 'kinds of' Y's are there?" Each question constitutes a single "frame," while each response forms the basis for a new "frame."

In the Numic languages, the "kind of" relationship basic to this technique is often difficult to express in a simple sentence. In Northern Paiute, for example, the native sentence most frequently offered as equivalent to English "is X a kind of Y" is "is X 'like' Y," /-waʔniʔyu/. This is not always satisfactory for class inclusion interrogation, as "like" can be ambiguous in Northern Paiute, as it is in English. Things may be "like" each other for different reasons; i.e. because of color, taste, smell, techniques of preparation, etc., and these may change from item to item and informant to informant. Difficulties such as these can be surmounted by circumlocation, but the overall efficiency of the technique is often impaired. Formal frame analysis was used in these investigations, but only as supplemental to the other approaches (see Table 1 for a Northern Paiute example).

Native texts and "folk definitions" provided a much wider range of information, including data on taxonomic relationships. Texts were recorded in the form of discussions focused around specific plants and animals. Bilingual interpreters, instructed to ask questions of their choosing, led native-language discussions. Taxonomic and other classificatory information was later extracted from context and rediscussed.

Pressed and fresh plant specimens served as focal points for discussions on plants. Large samples of fresh specimens were collected in the field, primarily under the direction of native informants and shown to others. When this was not practical, a "traveling herbarium" of pressed specimens from other areas was used. In most cases, informants were able to identify materials satisfactorily from pressed specimens, not only by distinctive appearance, but by smell.

The collections of plants from the various Numic areas should be fairly representative of the current native-known resources. The numbers of identified specimens by study area are as follows: for Northern Paiute, 216 species; for Shoshoni, 137 species; and for Southern Paiute (all

Table 1: Data Derived Through Formal Frame Analysis (Metzger and Williams Technique). (One Northern Paiute Case Represented.)

Q. [hɨ́i tuʔíhi kadɨ́ipɨgubagweitɨ]

What is everything on or above the earth?

A. [tidɨkásan·a] — Things we eat

Q. [him·ádɨwazu] — What else?

A. [tidɨhóaweisan·a] — Things we hunt

Q. [him·ádɨwazu] — What else?

A. [padúhatɨ] — Things under the water

Q. [him·ádɨwazu] — What else?

A. [yozɨ́dɨ] — Things that fly

Q. [him·ádɨwazu] — What else?

A. [óʔnosaba] — That's all

Q. [hɨ́i tɨkásan·a] — What is eaten?

A. [akɨ́, tɨbá, kuhá, acá, kam·ɨ́,]. . . . . .

Sunflower, pine nut, blazing star, tansy mustard, rabbits, . . .

Q. [hɨ́i tɨhóaweisan·a] — What is hunted?

A. [tɨhɨ́ʔya, kóipa, tɨn·á] — Deer, mountain sheep, antelope

Q. [hɨ́i yozɨ́dɨ] — What flies?

A. [huzíba, pɨhɨ́, páanosa, wohɨ́tya]

Birds, duck, pelican, swan

Q. [hɨ́i padúhatɨ] — What is under the water

A. [agái, kuyúi] — Trout, cui-ui

Q. [him·á sunɨ́mɨ kái tɨkásan·a] — What don't the Indians eat?

A. [togóg·wa, mugúzu, pamógo, soáda, pipúzi, tɨb.óca, kagwɨ́duhuʔu

Rattlesnake, lizard, frog, spider, stink bug, lizard, mountain lion

. . . . . .

areas) 367 species. The Shoshoni sample lacks several important "spring" plants, as the study was made in late summer. Tentative identifications of some of these have been made from other sources (Hoebel 1934; Shimkin 1947; Steward 1938).

The correlation of Numic lexemes with common English animal names, and in a few cases with genus-species designations, was accomplished largely by showing informants pictures of these forms in books. In a few cases, actual field identifications were made, but as no attempt was made to collect and catalog animal specimens, all of these should be regarded as tentative.

C. The Northern Paiute Classification

Northern Paiute informants questioned segregated the natural phenomena of the world, glossed "from people (Indians) on down, everything on or above the earth" [nɨmɨwáimanag^{w}an.a tu?íhi kadíipɨgubàg^{w}aitɨ] into three major categories: (1) *things that are eaten* (as food), (2) *things that are used*, and (3) *things that are not used*. The corresponding Northern Paiute terms are, in order, [nadɨ́kadɨ], [nahán.idɨ] and [kái nahán.idɨ]. The taxonomies of each of these are given in Figures 2-7. The overall scheme is presented in Figure 1.

In addition to the usual vertical arrangement common to taxonomies, the Northern Paiute data also seem to present an arrangement from left to right (as indicated by arrow, Figure 1). The category *things that are eaten* [nadɨ́kadɨ] is always discussed first by informants, even in highly structured eliciting situations such as suggested by Metzger

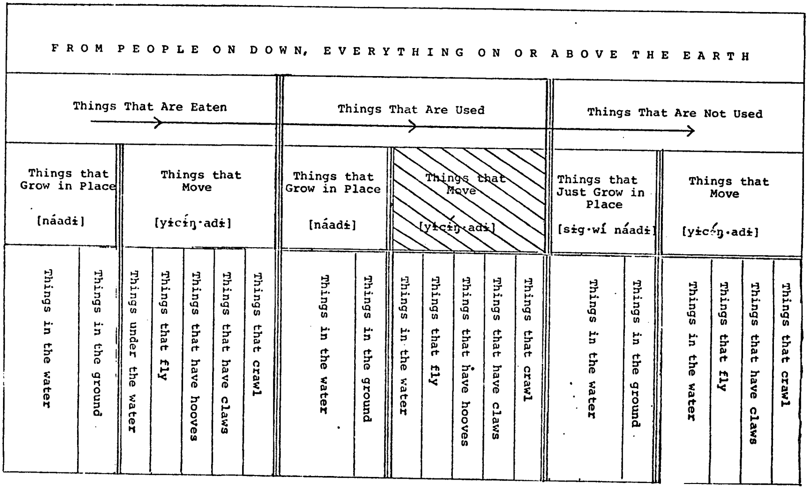

Figure 1: From People on Down, Everything on or Above the Earth

and Williams (1966) (see Table 1). The other two categories are of less importance, with things that are used perhaps operating more covertly than overtly (Fowler and Leland 1967).[9] This tends to reinforce the view that categories based on use are of primary importance. These intersect with categories based on biomorphology, habitat, etc., as we proceed through the schemes.

1. Things That Are Eaten

The major category things that are eaten has two primary subdivisions: things that grow in place [náadɨ], literally "growers," and things that move [yɨcɨ́ŋadɨ], literally "movers" (see Figure 2). These designations bear some relationship to the English concepts "plant" and "animal," as defined in the most inclusive sense; i.e. a plant, to quote Webster (1964:1110) is "any living thing that cannot move voluntarily, has no sense organs, and makes its own food by photosynthesis; vegetable organism" and an animal is "any living organism typically capable of moving about, but not making its own food by photosynthesis" (Webster 1964:58). Informants recognize this mobile vs. immobile distinction, as

[9]Some informants hesitated in placing things that move in the category [nahán.idɨ]. All agreed that pelts, feathers, hooves, etc., are used, and that one could say in Northern Paiute "the deer is used," but they did not offer the categorization freely. This section of the taxonomy has been marked with diagonal lines to indicate their hesitancy. Since most of the forms indicated are also hunted as food, the "used" materials may be little more than the natural by-products of hunting activities. The term [nahán.idɨ] also translates as "things that are taken," perhaps further implying that forms "taken" are also "used."

<table>
<tr><td colspan="7">Things That Are Eaten [nadɨ́kadɨ]</td></tr>
<tr><td colspan="6">Things that Grow in Place [náadɨ]</td><td rowspan="2">Things that Move [yɨcɨ́ŋ·adɨ]</td></tr>
<tr><td colspan="5">Things in the Ground [tíipɨnatɨ]</td><td>Things in the Water [páaweitɨ]</td></tr>
<tr><td>seeds [apúi]</td><td>berries [kam·ádɨ]</td><td>greens [puináadɨ]</td><td>roots [atɨná]</td><td>flesh [atukú]</td><td></td><td></td></tr>
<tr><td>[acá] tansy mustard</td><td>[ciábui] wild rose berry</td><td>[ɨ́ɨzˀi] <u>Allium</u> sp.</td><td>[hun·íbui]</td><td>[tuhú] "Indian Asparagus"</td><td>[pibúpɨ] Unidentified</td><td></td></tr>
<tr><td>[akɨ́] mule's ears</td><td>[hub·ú] elderberry</td><td>[kam·ɨ́ s·igí]</td><td>[yapá] Indian potato</td><td>[nɨmɨ́ n·aká] mushrooms</td><td>[sáibɨ] tule</td><td></td></tr>
<tr><td>[kóogi] sego lily</td><td>[hun·ábi] huckleberry</td><td>[padɨ́zi] wild onion</td><td>[yadɨ́ci]</td><td></td><td>[tóibɨ] cattail</td><td></td></tr>
<tr><td>[kuhá] blazing star</td><td>[húupui]</td><td>[síigi] <u>Allium</u> sp.</td><td>[kaŋɨ́tya]</td><td></td><td></td><td></td></tr>
<tr><td>[tɨbá] pinenuts</td><td>[tɨábui] Sarvis berry</td><td></td><td>[kóogi] sego lily</td><td></td><td></td><td></td></tr>
<tr><td>[wáada] seep weed</td><td>[tóˀisabui] chokecherry</td><td></td><td>[payapá]</td><td></td><td></td><td></td></tr>
<tr><td>[wái] rice grass</td><td>[wíapui] buck berries</td><td></td><td>[tam·áciwa] nut grass</td><td></td><td></td><td></td></tr>
<tr><td>[wía] acorn</td><td></td><td></td><td>etc.</td><td></td><td></td><td></td></tr>
<tr><td>etc.</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Figure 2: Things That Are Eaten (A)

well as a difference in ingestion, although things that grow in place are thought to "feed" themselves on water taken in through their leaves and roots. The animate vs. inanimate distinction, noted by Mathiot (1962) as implicit in Papago (but see also Pilcher 1967), is not wholly appropriate here, although informants hesitate to label things that grow in place as "living."

Things that grow in place are or two major types: those found in the water [páawaitɨ] and those found in the earth [tíipɨnatɨ] (implying rooted in the earth). To designate "plants" specifically, as opposed to "animals," rocks, etc., the terms [tíipɨnanaadɨ] and [páawainaadɨ] can be used.

The plants that grow in the ground are grouped at this level according to the part of the plant that is eaten: seeds [ʔapúi], roots (tuber or expanded stem) [ʔatɨ́na], berries [kam.ádɨ], greens [púinaadɨ] and flesh [ʔatukú]. Seeds [ʔapúi] has the largest number of indivual plant members. The presence of a hard outer layer for all of its members and similarities in methods of preparation seem to be the unifying features of the class rather than size, general appearance of the parent plant, or some other criterion. The used portion of the plant is the focus of attention rather than its overall physical or morphological characteristics. Common seeds include: tansy mustard[10] [acá], wolley mule's

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[10]In this chapter, in the interest of space and simplicity, plants and animals will be identified by common name only. Binomial identifications for some of these are provided in the cognate sets, Chapter V.

ears [akɨ́], blazing star [kuhá], seepweed [wáada], rice grass [wái], acorn [wiyá], pine nut [tɨbá], etc. (see Figure 2).

The category berries [kam.ádɨ] also contains several members, some with the common morpheme [-p/bui] "eye, seed" used as a suffix. Included are [tóˀisabui] chokecherry, [wiyápui] buckberry, [ciábui] wild rose berry, [tɨábui] service berry and [acábui] raspberry. In addition, there are also [hub.ú] elderberry and [hunábi] huckleberry, designates that do not end in the morpheme. One of the members of the grouping roots also contains [-p/bui]: [hun.ípui] a biscuit root, Lomatium sacrocarpum. Dependence on linguistic criteria alone might lead one to group the root with the other berries containing the common morpheme, thereby introducing possible confusion. It is, however, interesting to note possible linguistic criteria in grouping plants (see Frake 1962:179).

The category greens includes several onion-like plants whose tops were eaten, such as [ɨɨ́ziˀ], [síigi], [síi], [padɨ́zi], etc., and a leafy green [kam.ɨ́ s.igí], Glyptopleura marginata. The name for this plant has an obvious etymology, the literal meaning being "rabbit's intestine," derived from the convoluted appearance of the leaves. The botanical name has a parallel reference: Greek glyptos, "carved," and pleura, "side," referring again to the sculptured appearance of the leaves (Munz and Keck 1963:1300).

The category flesh [ˀatukú] includes two prominent members: the parasitic Orobanche [tuhú], whose fleshy stalk was roasted and eaten, and mushrooms [nɨmɨ́ n.aká], literally "person's ear." There does not seem to be great elaboration within the designate "mushrooms" in this particular area of Northern Paiute territory. Lamb (1958b) reports several named varieties of mushrooms for Mono, on the western slope of the Sierra. Other Numic groups also recognize and name more than one type of mushroom, as will be noted below. Environmental features and cultural food preferences are doubtless of importance here.

The water plants [páawaitɨ] in the eaten category are not further subdivided, and include named varieties, such as cattail [tóibɨ], tule [sáibɨ], and others.

The category things that grow in place contrasts with things that move (see Figure 3). Things that move [yɨcɨ́ŋadɨ] is divided into things that crawl [nuyúadɨ], things that have claws [sidúkaʔya], things that have hooves [tosɨ́gɨgaʔyu], things that fly [yozɨ́dɨ], and things under the water [padúhatɨ]. Means of locomotion and common morphology seem to be the common elements subdividing this category, but this is not entirely clear from a consideration of the designates.

The category things that fly [yozɨ́dɨ] includes two primary subdivisions: [huʒíba] birds and [muíbig^{w}aʔnìʔyu] or fly-like things. An alternative term for fly-like things is [tɨtɨ́gɨcɨʔyu yozɨ́dɨ] "tiny fliers," indicating that size is a criterion for division. The category birds includes, for most informants, the English taxonomic designation "birds" as well as bats, and has two subdivisions according to flight pattern and habitat: [paʔág^{w}aitɨ], "high location fliers," and [tíipɨnag^{w}aitɨ], low or ground location fliers."

Things That Are Eaten [nadɨ́kadɨ]							
Things that Grow in Place [naadɨ]	Things that Move [yɨcɨ́ŋ·adɨ]						
	Things that crawl [nuyúadɨ]	Things that have claws [sidúkaʔyu]	Things that have hooves [tosɨ́gɨgaʔyu]	Things that fly [yozɨ́dɨ]			Things under the water [padúhatɨ]
				birds [huziba]		fly-like things [muibigwaʔniʔyu]	
				high [paʔágweitɨ]	low [tɨ́ipɨnagweitɨ]		
	[áadakwa] grub	[cag·wɨ́dɨ] porcupine	[kucú] buffalo	[nag·ɨ́ta] geese	[huzí] sagehen	[kɨ́a] locust	[agaí] cutthroat trout
	[nizú]	[huná]	[kóipa]	[páanos·a] (noho) pelican eggs	[cidáan·u]		[kuyúi]
	mormon cricket	badger	mountain sheep		snowbird		cui-ui
	[pabáʔyu huída nohó]	[ikwɨ́]	[pakúcu]	[pɨhɨ́]	[sáaya]		[musúi pag·wí]
	egg of big ant	California ground squirrel	moose	duck	mud hen		catfish
		[kam·ɨ́]	[patɨhíd·ya]	[wohítya]	[sɨkígi]		[tocíbag·wi]
		jack rabbit	elk	swan	mountain quail		minnow
		[kid·yɨ́]	[tɨhɨ́ʔya]				[ʔaʔwágu]
		ground hog	deer				sucker
		[kɨ́ɨba]	[tɨn·á]				
		ground squirrel	antelope				
		[tabúʔu]					
		cottontail					

Figure 3: Things That Are Eaten (B)

Birds that spend most of their time on the ground and fly for only brief periods at low altitude are grouped in the ground category. Those that spend more time in high flight, or off the ground and in the trees are classed as high fliers. One informant said that birds called low fliers "can't get up more than 20 or 30 feet off the ground." High fliers include ducks [pɨhɨ́], swans [wohítya], geese [nagɨ́ta], etc. The edible ground birds include sage hen [huʒí], mountain quail [sɨkígi], mud hen [sáaya], etc. Mathiot (1962:156) has noted a similar high vs. low distinction for birds in Papago, and the concept also operates for Southern Paiute. An alternative based on size is also noted below (see "Other Northern Paiute Classifications").

The category fly-like things [muíbig^{w}aʔniʔyu] includes small flying creatures such as locusts [kɨ́a]. In the major division things that are not used, the category has other subdivisions (see Figure 7).

The edible [padúhatɨ] or things under the water include several types of native fish, such as cutthroat trout [agái], Pyramid Lake's cui-ui [kuyúi], catfish [musúipag.^{w}i], sucker [ʔáʔwagu], etc. The boundaries of this category have not been fully established as yet, in that I am not sure whether such things as fresh water mussels, crayfish and others would be included here. Except for crayfish, other "water creatures" are relatively rare in this particular area of Nevada. The names for two of the fish have obvious etymologies: [musúibag.^{w}i] (catfish) or "moustache fish" and [tocíbag.^{w}i] "shiny or transparent fish." The latter term is applied to schools of minnows.

2. Things that Are Used

The category things that are used contrasts with that of things that are eaten and things that are not used as illustrated in Figures 4-5. The groupings are the same to the level things in the ground/things in the water for plants, and through comparable morphological sections of animals. Plant categories will be stressed and [yɨcɨ́ŋ.adɨ] or things that move merely outlined. The same procedure will be followed for the category things that are not used, except where contrasts are particularly meaningful for later discussions of other Numic systems.

As compared with things that are eaten, the organizational principles for plants that are used are different below the level of things in the ground and things in the water, the segregates being based on a mixture of use, appearance, growth associations and other criteria. The divisions shown are illustrative, not exhaustive, and do not form contrast sets in all details, e.g. see the subdivisions under medicine.

Two divisions at this level are made according to use. The first is medicine [natɨ́sua] and the second is gum [sanáko?o]. The gums include several named types, the name usually being followed by the term for the appropriate part of the plant yielding the gum, such as [sawábono?o] "sagebrush balls" (actually galls) and [sɨŋábi pui] "cottonwood (tree) seeds." Medicines are grouped according to how they are prepared and administered to the patient, i.e. chewed

<table>
<tr><td colspan="12">Things That Are Used [nahán·idɨ]</td></tr>
<tr><td colspan="11">Things that Grow in Place [náadɨ]</td><td rowspan="6">Things that Move
[yɨcɨ́ŋ·adɨ]</td></tr>
<tr><td colspan="10">Things in the ground [tíipɨnatɨ]</td><td>Things in the water
[páaweitɨ]</td></tr>
<tr><td colspan="7">medicine [natɨ́sua]</td><td>willow
[sɨ́ɨbi]</td><td>forest
[wogópi]</td><td>grass
[wahábɨ]</td><td>gum
[sanákoʔo]</td><td rowspan="4">[páahi]
moss
[tóibɨ]
cattail
[sáibɨ]
tule
[wokókobɨ]
cane
[sóiʔwipɨ]
<u>Equisetum</u>
[payágopɨ]

[pawáhonibɨ]</td></tr>
<tr><td>things that are chewed</td><td>things that are liquified to make a poultice</td><td>things that are sprinkled to baptize</td><td>things that are sucked</td><td>things that are smoked</td><td>things that are drunk</td><td>...</td><td rowspan="3">(see text)</td><td rowspan="3">(see text)</td><td rowspan="3">(see text)</td><td rowspan="3">(see text)</td></tr>
<tr><td>[nɨgɨ́-ʔwayadɨ]</td><td>[nabádudɨ]</td><td>[naʔbámusia-dɨ]</td><td>[namúgudɨ]</td><td>[nabámuidɨ]</td><td>[nahíbidɨ]</td><td>etc.</td></tr>
<tr><td>[sawábi]
<u>Artemisia</u>
[tóozaʔa]
<u>Leptotaenia</u></td><td>[akɨ́pɨ]
[tóozaʔa]
<u>Leptotaenia</u>
[nagágibɨ]
<u>Veratrum</u>
[pasógobɨ]
death camas</td><td>[híiwobi]
<u>Hermidium</u>
[kanígiaʔa]
[sawábi]
sage
[tóozaʔa]
<u>Leptotaenia</u></td><td>[mugútuhupi]
<u>Dalea</u>
[pagágibɨ]
<u>Veratrum</u>
[pasógobɨ]
death camas</td><td>[púibahmu]
<u>Nicotiana</u>
[tóozaʔa]
<u>Leptotaenia</u></td><td>[mugútuhupi]
<u>Dalea</u>
[canábi]
desert peach
[hɨnábi]
bitter brush
[kataábi]
fir
[pawápi]
juniper
[tɨ́agono-gibɨ]
<u>Rumex</u>
etc.</td><td></td></tr>
</table>

Figure 4: Things That Are Used (A)

[nɨgɨ́ʔwadɨ], liquified to make a poultice [nabádudɨ], sprinkled to asperge [nabámusiadɨ], sucked or dissolved in the mouth [namúgudɨ], smoked [nabámuidɨ], drunk [nahíbidɨ], etc. Several alternative classifications were suggested for medicines (Fowler and Leland 1967:401). This seems to be an area where specialized knowledge influences constructs. Since many medicinal plants can be used in various ways and for various purposes, some are listed under more than one subdivision. The plants do not form contrast sets; it is the uses that contrast. More common medicinal plants include: big sagebrush [sawábi], Indian balsam [tóozaʔa], death camas [pasógobɨ], Hermidium sp. [híiwobi], bitterbrush [hɨnábi], juniper [wáapi], dock [tɨ́akonogibɨ], etc.

The category forest [wogópi] is defined for the growth association of a number of tall, woody-stemmed plants or trees perceived to grow together in Sierran environments. The forest designation does not include understory plants, such as manzanita, found in the same environment. The members include only the tall trees, such as fir tree [katáabi], cedar tree [pawáapi], oak tree [wiyá], aspen tree [sóobi], and [wogópi], here used at a different level of contrast to refer to long-needled pine trees and specifically to jeffrey pine. Pinyon [tɨbápi] and juniper [wáapi] are excluded from the forest category because, informants say, they grow apart from the other trees mentioned and are scattered on the hillsides--a valid habitat observation. They are also viewed as closely related to each other because of this growth association. Cottonwood trees [sɨnabi] and large willow trees [sagapi] also fall outside this grouping. The term for cottonwood tree can include the willow tree at one level, and can also be used in popular speech today for any deciduous tree. Trager (1939) has also noted this feature in the Southwest, where, as in the western Great Basin, the cottonwood is the most prominent native deciduous tree. We will return to a discussion of this point when we consider the processes of category development in the Numic biotaxonomic systems (see Chapter V).

The category grass [wahábɨ] groups together a number of plants on the basis of physical or morphological character. The member species have slender parallel-sided leaves and grow in clumps. Part of the Linnaean taxonomic family Graminae is included here, in the things that are used category, but in the things that are not used category, small rushes (Juncaceae) and other slender-stemmed plants are also included.

One other grouping of plants at this level is that of [sɨ́ɨbi] or willows. This classification has several named types, not nearly as specific as the taxonomic species designations. Only certain willow species were valued for basketry. The close connection of the term for willow with "basketry fiber" in other areas will be discussed later in Chapter V.

In addition to the groupings of plants just reviewed, there are several other plants that do not fall under any subcategory designation (except for use contrast). These named varieties include rose bush [ciábui] and chokecherry [tóʔisabui], used for baby basket frames and pipes, greasewood [tonóbi] for the hard tips of foreshafted arrows, hemp [wiha] for cordage and string, etc.

The used plants classed as things in the water [páawaitɨ] are individually named varieties which are used in many ways but form no apparent subgroupings. These include algae [páahi], equisetum [sóiʔwipɨ], cattail [tóibɨ], tule [sáibɨ], cane [wokókibɨ], etc. They are used for mats for houses, blankets for cradle baskets, arrow shafts, whistles, etc.

The used things that move [yɨcíŋadɨ] are classified in the same way as things that are eaten; i.e., into things that crawl, things that fly, things that have hooves, things that have claws, and things in the water. The clawed animals have a further subdivision covering felines [tuhúʔu]. The names applied to individual feline members are compounds of this term plus a descriptive (see Figure 5). [tuhúʔu] is also the term for wildcat.

The things that fly in this category include only high flying birds. The other subdivisions are not represented, according to data gathered thus far. Birds are used primarily for feathers, talons, etc., and include eagle [k^wiʔnáʔa], owl [muhúʔu], hawk [nakáʔi], woodpecker [aʒábanaʔa], etc. The used things in the water include minnows [tocípagwi], for fish bait, the cui-ui [kuyúi] (bladder used for glue), etc.

Things That Are Used [nahán·idɨ]							
Things that Grow in Place [náadɨ]	Things that Move [yɨcíŋ·adɨ]						
	things that have hooves [tosɨgɨga ʔyu]	things that have claws [sidúka ʔyu]		things that crawl [nuyúadɨ]		things that fly [yozɨ́dɨ]	things under the water [padúhatɨ]
			cats [tujuʔu]	(snakes)	medicine [natɨ́sua]	birds [huzíba]	
						high [paʔagweitɨ]	
	[tɨhɨ́ʔya] deer	[wodáʔa] squirrels	[kakwíduhuʔu] mountain lion	[togóg·wa yaganubɨ] rattlesnake rattle	[aní] ant	[kwiʔnáaʔa] eagle	[kuyúi sonápi] cui-ui bladder
	[kóipa] mountain sheep	[kam·ɨ́] jack rabbit	[tocíʔyu-duhuʔu] lynx		[tɨb·oca yokósana] lizard semen	[muhúʔu] owl	[tocíbag·wi] minnows
	[kucú] buffalo	[tabúʔu] cottontail	etc.			[nakáiʔi] hawk	
	[pakúcu] moose	[huná] badger				[azábana] woodpecker	
	[paatɨ́hid·ya] elk	[pamúsi] muskrat				[pɨhɨ́] duck	
	[tɨn·á] antelope	[páiyuna] otter				[páanos·a] pelican	
		[kohí] beaver				etc.	
		etc.					

Figure 5: Things That Are Used (B)

3. Things that Are Not Used

The last general division of the natural phenomena to be summarized is the class of materials that are not used [kái nahán.idɨ]. An alternative term for this grouping according to some informants is [sɨgʷ.í caʔábɨ] or just trash. Others apply the just trash designation only to things that grow in place, excluding things that move. Plants in this division are called [sɨg.ʷí náadɨ] just growth, comparable to the English designation "just a weed." The land plants are grouped into the following segregates: [sɨgʷ.í tonígaʔa] just flowers, further subdivided according to color or some other distinguishing characteristic such as smell. Examples of the latter are: [iʒáʔa sin.á] "coyote's urine" (prickly poppy) and [pug.ú sin.á] "horse's urine" (cleome), for their strong odor. A second grouping is [sɨgʷ.í wahábɨ] just grass, and includes numerous named and unnamed grasses along with a few that are named but useless, such as [tɨs.íbɨ] salt grass, [poʒídapɨ] clover (also applied to alfalfa and other introduced clovers), and [monópɨ] or fox tail. The term [sɨg.wí sɨ́ɨbi] covers undifferentiated willows. Other terrestrial and water plants can be called by any of the designations, just trash [sɨg.wí caʔábɨ], just growth [sɨg.wí náadɨ], or just green growth [sɨg.wí púinaadɨ]. Thorny plants can also be called [nɨmɨ́ cihídɨ] "people stickers."

The water plants within the division things that are not used [kái nahánidɨ] include a few named varieties and numerous other unnamed types that can be called [páawai náadɨ] or water growth (see Figure 6).

Things That Are Not Used [kái nahán·idɨ]						
Things that Just Grow in Place [sɨg·wí náadɨ] [sɨg·wí ca'ábɨ]						Things that Move [yɨcɨ́ŋ·adɨ]
Things in the ground [tíipɨnatɨ]					Things in the Water [páawaitɨ]	
just flowers [sɨg·wí tonigá'a]	just grass [sɨg·wí wahábɨ]	just willows [sɨg·wí sɨ́ɨbi]	Indian stickers [nɨmɨ́ cihída]	. . . etc.		
[izá'asin·a] prickly poppy [pugúsin·a] other unnamed	[tɨs·íbɨ] salt grass [pozídapɨ] clover [monóbɨ] fox tail other unnamed	[izísɨɨbi] gray willow other unnamed	unnamed		unnamed	

Figure 6: Things That Are Not Used (A)

The category *things that move* has some additional subdivisions not recognized in the other main divisions (see Figure 7). The *crawlers* [nuyúadɨ] are divided into [huída] *ants*, with several types named for the color, size, etc. such as mountain ant [káibahuída], black ant [tú.huída], etc.; *lizards* [tab.íciba?a] which includes black lizard [tuákaki], gray lizard [mugúzu], and small lizard [tɨbóca], etc. Snakes are recognized as a subgrouping but without a consistent designating class label. Some informants applied the term for rattlesnake [togóg.wa] to the entire class, but others preferred to name each form separately. There does not seem to be a major division of snakes based on poisonous *vs.* non-poisonous as in Southern Paiute (see below). Spiders, ticks, beetles and other small *crawlers* are grouped together as [soáda], although the term is generally translated by informants to the English equivalent "spider." There are other crawlers that do not fall into any of these subdivisions, such as grub [wo?ábi], louse [puzí?a], and tortoise [kó?ya].

Fly-like things, a subdivision of *things that fly*, has as one member the designation [muíbi] *flies*, that includes named varieties, such as "big fly" [pabá?yu muíbi] (bottle fly), deer fly, or "gray fly" [iɫímuibi], etc. Other *fly-like things* are named without further subdivisions; examples are mosquito [wɨpóna], yellow jacket [not.á], butterfly [co?ápɨ], and moth [sɨtá?ju co?ápɨ] "ugly butterfly," etc.

The water creatures under *things that are not used* [kái nahán.idɨ] include frogs [pamógo] and unnamed fishes

Things That Are Not Used [kái nahán·idɨ]								
Things that Grow in Place [náadɨ]	Things that Move [yɨcɨ́ŋ·adɨ]							
	things that have claws [sidúkaʔyu]	things that crawl [nuyúadɨ]				things that fly [yozɨ́dɨ]		things under the water [padúhatɨ]
		ants [huída]	lizards tab·ícibaʔa]	(snakes)	spiders [soáda]	birds [huzíba]	fly-like things [muíbi-gwaʔniʔyu]	frogs [pamógo]
						high [paʔágweitɨ]	flies [muíbi]	
	[poŋáazi]	[káiba huída]	[túukaki]	[pahóobɨ]	[túus·oada]	[pakódoba]	[paɓáʔyu muibi]	[honópamogo]
	mice	mountain ant	black lizard	bull snake	black spider	black bird	big fly	
	[tabá]	[haʔínɨni]	[mugúzu]	[togóg·wa]	[nɨbáwoko-daʔa]	[sug·ú]	[izímuibi]	[izípamogo]
	kangaroo mouse			rattlesnake	tarantula	robin	deer fly	
	[poníʔya]	[haʔínabi]	[pasɨ́wɨ-nɨnɨʔɨ		[madábi]	[áŋ·ɨ]	[kwidáyagwaʔa]	[túupamogo]
	skunk		chuckwalla		wood tick	blue bird	gnats	
	[wacíʔa] racoon		[tɨb·óca]		[pipúzi] stink bug	etc.		[pag·wítogoʔo]
	[wydá] bear				[pusíʔa] louse	[pigáhanaʔa] bat		[pamósobɨ]
	[patákaiʔi] ring-tailed cat							[pad·ɨ́bonoʔo]
	etc.							[áapázi]
								[tɨb·ábonoʔo]

Figure 7: Things That Are Not Used (B)

[pak^{w}í]. Several frogs are named for color, as for example "black frog" [túupamogo], "gray frog" [ižípamogo], as well as for other characteristics. The etymology of some frog names is not so easily analyzed (see Figure 7).

4. Other Northern Paiute Classifications

The schemes presented above provides a basic, yet flexible framework within which Northern Paiute speakers can classify the plants and animals of their environment. All informants questioned would generally agree with this type of treatment, although not all would necessarily present their materials in just this way. Some would make additional associational groupings, such as by segregating categories for desert brush (labeled [sawábi] for big sagebrush), thorny desert brush (labeled [canábi] for desert peach) or rabbit brush (labeled [sigúpi] for *Chrysothanmus nauseosis*) from other materials (Fowler and Leland 1967). Figure 8 indicates some of these alternatives. As will be noted in Chapter V, the category rabbit brush is quite widespread, and may be of some historical significance.

Alternatives in designation are also found for some categories. Things we hunt [tɨhóawaisan.a] can be substituted for things with hooves. It can also imply a grouping such as game animals (see Table 1). Legitimate alternatives for the category birds are also provided by the form [kasága?yu] those with wings, and the dual division based on size with labels [k^{w}i?ná?a] large birds (from the term for eagle) and [huʒíba] small birds (of uncertain derivation; see Chapter V). This latter division is also found in other

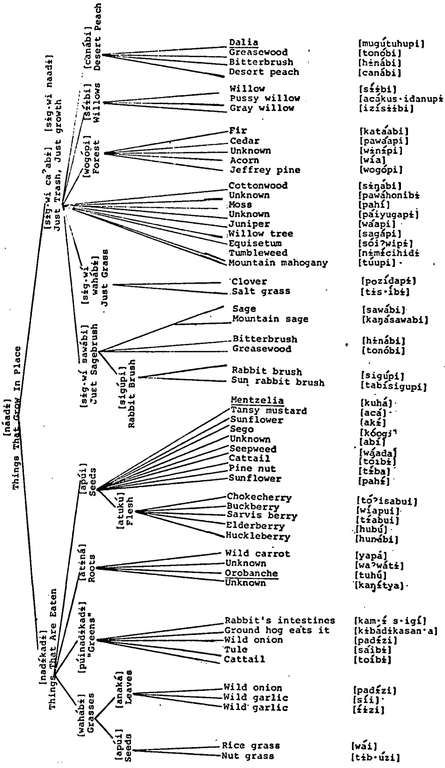

Figure 8: Things That Grow In Place

Numic areas, labeled similarly, as will be noted below.

Yet other informants prefer a dual distinction in the maximal groupings of the taxonomy, into <u>things that are eaten</u> and <u>things that are not eaten</u>. This is opposed to the tripartite division outlined above, as containing these two categories plus <u>things that are used</u>. We have noted in this connection that <u>things that are used</u> may function only covertly, in that most of the forms so discussed are the natural byproducts of food-getting activities (see above, and note 9).

These various alternatives to the categories discussed give a degree of flexibility to the Nothern Paiute system(s). This is further emphasized and facilitated by the presence of several semantic principles for recognizing relationships (use, biomorphology, habitat, habits, etc.). Use of one or more by some individuals may not preclude use of others by other individuals. Yet, from informant to informant, there is substantial agreement (see also Chapter IV). By far the most active and important area of recognition for all Northern Paiute speakers, however, is the most specific; i.e. the level that names individual plants and animals. Individuals are more concerned with recognitions here than with discussing higher level relationships. Intermediate level categories are also more difficult to elicit, particularly when using techniques of formal frame analysis. Lexemes marking many of these are also morphemically complex and etymologically transparent, in contrast to the simple and often root character of those at this level. This level corresponds roughly to the modern biologist's level of genus, a point to which we will return after describing the other Numic systems.

D. The Shoshoni Classification

Keeping in mind some of the features of the Northern Paiute classification, we will now look at the Shoshoni scheme, as elicited at Owyhee, Nevada. It is similar in basic outline to the former, being based on a concept of use, but with certain categories being defined on the basis of morphology, etc. It is less "elaborate" in terms of mid-range categories, although this may be an artifact of limited field time devoted to Shoshoni as compared with both Northern Paiute and Southern Paiute. The classification does illustrate certain features of category elaboration predictable from the environmental position of the Owyhee Shoshoni, i.e. in high, "cold desert" regions. The main features of the scheme are presented in Figures 9-13.

Owyhee Shoshoni informants questioned about plant and animal taxonomic relationships first segregated two basic types of phenomena: things that are eaten [nádɨkadɨ] and things that are not eaten [kíi nádɨkadɨ]. These parallel the basic distinctions made by Northern Paiute informants. The second major division of phenomena within each of these categories was then into groupings of plants [sɨ́haka] or [tɨ́ma sɨ́aŋgɨpɨ] and animals [nɨ́midɨdɨ]. The lexeme [sɨ́haka] apparently derives from the verb stem /sɨa-/ "to grow," specifically "of plants" (see Chapter V). The alternative [tɨ́ma

EVERYTHING ON THE EARTH	Things that are not eaten kii nadɨkadɨ	things that move nɨmidɨdɨ	things with fur	pɨhɨgantɨ
			things that fly	yɨcɨnadɨ
			things that crawl	nuyuantɨ
			birds	hucuʔu
			things in the water	paakupantɨ
		things that grow/plants sɨaka ~ tɨma sɨaŋkapɨ	things that are no good	kii nuzandɨ
			grass	sonipɨ waabɨ
			trees	
			willows	sɨhɨbi
			medicines	natusu
			water plants	puhipoʔnoʔo
	Things that are eaten nadɨkadɨ	things that move nɨmidɨdɨ	those we hunt	tɨtɨgemiadɨ
			those with fur	pɨhɨgantɨ
			birds	hucuʔu
			those that crawl	nuyuantɨ
			things in the water	paakupantɨ
		things that grow/plants sɨaka ~ tɨma sɨaŋkapɨ	seeds	peyhi
			roots	tɨdɨna
			berries	huutɨkapɨ
			greens	puhipɨʔɨ
			things in the water	paakupantɨ

Figure 9: Shoshoni Classification (General Categories)

síaŋgɨpɨ] is also related and is defined as "all plants together." The term for animals [nɨ́midɨdɨ] is translated by informants as "things that move about." According to Wick Miller (personal communication 1971), it is also from a verb stem /nɨmi-/, "to move about, wander." It can also be used with reference to people, in the sense of "to make a living in the aboriginal manner--by hunting and gathering" (see Chapter IV for a Northern Paiute cognate). It is clearly not a root term for animal.

1. Things that Are Eaten

The plants that are eaten are divided, as in Northern Paiute into categories based on use (see Figure 10). These include the following: seeds [péyhi], roots [tɨ́dɨna], berries [húutɨkapɨ] ("stick-food?") and greens [púhipɨʔɨ]. Seeds include a number of named varieties, with some that have Northern Paiute cognates (see Figure 10). The important seeds include: blazing star [kúha], ryegrass [síihu], wheat grass [pádɨsiipɨ], tansy mustard [póina] and a chenopod [ɨ́ʔapɨ]. Within this category, seed-producing sunflowers [akɨ] are also of several named varieties: [ákɨ] mule's ears, common sunflower [páʔakɨ], arrow-leafed balsam [kúsiʔakɨ] ("gray" or "ashen" sunflower), "big sunflower" [píiʔakɨ] Helianthella uniflora and "white sunflower" [tósaʔakɨ].

The category roots has more named members in this Shoshoni classification than in any elicited thus far for other Numic speakers. This reflects both the environmental potential in these northern areas and Shoshoni utilization

<table>
<tr><td colspan="12">Things that are Eaten
nadɨkadɨ</td></tr>
<tr><td colspan="11">Things that grow/plants sɨaka ~ tɨma sɨaŋkapɨ</td><td rowspan="3">things that move</td></tr>
<tr><td>seeds
peyhi</td><td>roots
tɨdɨna</td><td colspan="3">berries
huutɨkapɨ</td><td colspan="2">puhipɨ?ɨ
greens</td><td rowspan="2">canabi prickly pear</td><td rowspan="2">tu?i Orobanche</td><td rowspan="2">mɨ.za?a cactus
etc.</td><td>in the water
paakupantɨ</td></tr>
<tr><td>kuha mentzelia
poina tansy
?ɨapɨ chenopod
—
akɨ sunflower
—
akɨ Wyethia
pa?akɨ Helianthus
kusi?akɨ Balsam
pia?akɨ Helianthella
tosa?akɨ White Wyethia</td><td>huniba biscuitroot
yamba Carum
paiyamba water Carum
siigo sego
haapi?i biscuitroot
coiga cous
pasigo camas
kana bitterroot
cogozina Claytonia</td><td>pogombi currants
—
ohapogombi yellow currants
eŋgapogombi red currant
tuupogombi black currant
mugumbogombi gooseberry
wesibogombi gooseberry
wɨdapogombi "bear's currant"
—
to?nambi chokecherry
—
tabido?nambi light choke
pahodo?nambi big seed
—
tɨ?ampi service berry</td><td>ci?ambi rose</td><td>etc.</td><td>sɨgibɨ leaves
?ɨapɨ chenopod
pamuha onion
kɨŋga onion
cɨ?na thistle
awamo?o onion
nɨmɨ tɨbuhi lettace</td><td>waabɨ grass
siihu rye
etc.</td><td>saipɨ tule
to?ipɨ cattail
pag^{w}anna mint</td></tr>
</table>

Figure 10: Shoshoni Things that Are Eaten (A)

of this potential. The unnamed roots include: [húníba] and [háapi?i], both varieties of biscuitroots, sego lily [síigo] and camas [pásigo], bitterroot [kána], wild carrot [yámba] and unidentified [páiyamba] and wild potato [cógozina].

The category berries [húutɨkapɨ] also is elaborated, probably also due to the environmental potential of these northern Basin zones. There are three named subdivisions of berries, as well as several varieties named individually. The sub-groupings are: currants [pógombi], including yellow currant [óhapògombi], red currant [éŋgapògombi], black currant [tú·pògombi], gooseberry [múgumbògombi] and gooseberry [wésibògombi] (also bear's berries); chokecherries [tó?nambi] including common chokecherry [tó?nambi], "light or sun chokecherry" [tábidò?nambi] and "big seeded" chokecherry [páho-dò?nambi]; and service berries [tɨ́?ampi], including common service berries [tɨ́?ampi] and coyote's service berries [íǰapɨ?ɨdɨ?ampi], a scrubby type not ordinarily eaten. In addition to these sub-categories, elder berry [tɨ́iyambɨ?i], buck berry [wí?yɨmbi] and wild rose (hips) [cí?ambi] are also included as berries.

The category greens [púhipɨ?ɨ] contains two subdivisions: leaves [sɨ́.gibɨ] and grass [wá.bɨ] or [wá?abɨ]. The category grass intersects with that of seeds. Leaves include: wild lettuce [nɨ́mɨ tɨ́buhi], thistle [cɨ́?na], chenopods [ɨ́?apɨ] and several onions (no class label) including *Allium parvum* [kɨ́ŋga], a small onion [áwamo?o], *Allium accuminatum* [pamuha], and probably others.

In addition to the categories defined for the part of the plant taken, there is also a recognized category for water plants [páakupantɨ], literally "in, under the water." These include several named varieties such as mint [páak^{w}an-naʔa], or "water smell," tule [sáipɨ], cattail [tóʔipɨ], etc. (see Figure 10). Several other eaten plants are named individually, but not further sub-categorized. These include two types of prickly pear cactus [cánabi] and [mɨ́zaʔa], the parasitic Orobanche [túʔi], and several others.

Things that move about [nɨ́midɨdɨ] in the edible category are divided into the duality land vs. water, although only the latter is formally marked. The sub-categories in these divisions are based on mixed criteria of morphology, motor habits and activities. These are: those we hunt [tɨ́tɨgemiadɨ] or alternatively, [wásɨpi] "game animals;" those with fur [pɨ́hɨgantɨ], birds [húčuʔu], things that crawl [núyuantɨ] and things in the water [páakupantɨ]. The category those we hunt is comparable in membership to the Northern Paiute category things with hooves. It includes large game animals such as antelope [wánzi] (male) and [k^{w}áhatɨ] (female), deer [tɨ́gɨʔya], buffalo [píaguci], mountain sheep [wásɨpɨ] and elk or "water deer" [páatɨgɨʔya]. The term for mountain sheep is derived from the verb /wasɨ-/, "to kill, pl." as is the alternative designation for this category [wasɨpi] "game animal." Elk, mountain sheep and moose ("black water deer") [túupaatɨgɨʔya] were noted by informants to be rare to absent in Owyhee country.

Things with fur [pɨ́hɨgantɨ] are grouped by informants into four sub-categories, none of which has a consistent class label. These are (see Figure 11): *squirrels*, including ground squirrels [cíipi~cíipiša] and [kɨ́ɨpa], woodrat [ká?aci], ground hog [yáha] and chipmunk [wó?i], etc.; *water creatures with fur*, defined for habitat and including otter [pánzoku], muskrat [pánzɨna], beaver [háni] and racoon [páŋg^{w}ida]; a sub-category for *larger things with fur*, including badger [húna], porcupine [yɨ́hnɨ] and for some, racoon [páŋg^{w}ida]; and rabbits [kámmɨ], including jack rabbit [kámmɨ], snowshoe rabbit [píagammɨ] (in winter called [tósakammɨ], and cottontail [tá?abu]. The feeling is that these various groupings of animals represent particular associations of forms, although none except *rabbits* is clearly marked as such. Berlin, Breedlove and Raven (1968) have also noted that unmarked categories are a feature of other folk systems.

Shoshoni speakers interviewed were of two opinions on the category *birds*. Some preferred to leave the category undivided, labeling all birds regardless of size as [húču?u]. Others preferred a dual division, noting that [húču?u] was more properly for *small birds* and [k^{w}ína?a] was for *large birds*. None of those interviewed suggested categories for "high fliers" or "low fliers" as in Northern Paiute, although in spontaneously listing the various birds, they often kept within such sets. The only named sub-grouping for the birds recognized by all speakers was that for *ducks* [pɨ́ihu~pɨ́ɨye]. Members of this category include ducks named for color, size, call, etc. Those included in the *edible* category are mallard

Things that are Eaten nadɨkadɨ							
things that grow/plants sɨhaka	Things that move nɨmidɨdɨ						
	Those we hunt tɨtɨgemiadɨ "game animals wasɨpi	those with fur pɨhɨgantɨ		birds hucu?u	things that crawl nuyuantɨ	things in the water paakupantɨ	
						fish peng^{w}i	
	wanzi antelope k^{w}ahatɨ antelope tɨgɨ?ya deer buffalo piaguci wasɨpɨ mountain sheep paatɨgɨ?ya elk	ciipi ground squirrel kɨɨpa ground squirrel ka?aci woodrat yaha ground hog wo?i chipmunk	panzoku otter panzɨna muskrat hani beaver pan^{w}ida racoon huna badger yɨhnɨ porcupine pang^{w}ida racoon etc.	huca?a sagehen hewi?i dove piahuca?a grouse peng^{w}i tɨka pelican nɨgɨnda goose	ani red ant kɨa locust mizo?o cricket wo?abi greasewood grub	mugadɨ?ɨ sucker toyabeng^{w}i mt. trout peng^{w}i trout agai salmon musiwihu white fish	aatog^{w}opi crawfish
		kammɨ rabbits		pɨihu duck			
		kammɨ jackrabbit tosakammɨ snowshoe piagammɨ snowshoe ta?abu cottontail		pɨihu mallard sogopɨihu ground duck saiya mudhen			

Figure 11: Shoshoni Things that Are Eaten (B)

duck [pɨ́ihu], "ground duck" [sógopɨihu], mud hen or coot [sáiya], etc. Other edible birds include sage hen [húčaʔa], grouse [pía húčaʔa], dove, [héwiʔi], goose [nɨ́gɨnda], pelican [péŋg^{w}i tɨ́ka], literally "fish-eater," etc.

Things that crawl [núyuantɨ] within the eaten category include several named varieties, but with only one major subdivision: i.e., that for ants, from the term for red ant [áni]. Other crawlers include locust [kɨ́a], big cricket [mízoʔo] and greasewood grub [wóʔabi].

Things in the water [páakupantɨ] include fish [péŋg^{w}i] of several named varieties, including trout [péŋg^{w}i], mountain trout [tóyabèŋg^{w}i], salmon [ágai], whitefish [músiwihu] and suckers [múgadɨdɨ]. Crayfish [áatog^{w}opi] are separately categorized.

2. Things that Are Not Eaten

The Shoshoni category things that are not eaten [kíi nádɨkadɨ] is similarly divided into plants [sɨ́haka] and animals or things that move about [nɨ́midɨdɨ]. Plant sub-categories are defined on the basis of general morphology, or for use (see Figure 12). They include: things that are no good [kíi núzandɨ] or [kíhi názana], grass [sónipɨ], but also for some [wáabi] or [wáʔabi], trees (no cover term), willows [sɨ́hɨbi], medicines [nátusu] and water plants [púhipoʔnoʔo]. In addition, some plant species are named individually.

Things that are no good [kíhi núzandɨ~kíi nànzana], or weeds include flowers [tónʒiyangɨ], including some named varieties, such as lupin [kwídakwanna], literally "feces smell" and paint brush [tógoʔambisapɨ], and several others

Things that are not Eaten kii nadɨkadɨ						
Things that grow/plants sɨaka tɨma sɨankapɨ						things that move nɨmidɨdɨ
things that are no good/weeds kii naʒandɨ	flowers tónziyaŋgɨ	grasses sónipɨ wá?abi	water plants púhipo?no?o	trees	medicines natusu	
toyabi tɨbɨ?a mountain's penis (Mullein) tabuakica?a ground cherry tudunziipɨ poverty weed ubasapiabɨ dodder	kʷídkʷanna lupine togo?ambišapɨ paintbrush etc	tɨsiipɨ salt grass sonipɨ rye grass piasonipɨ giant rye etc.	so?wi?wihi equisetum paawo?einu equisetum pai?yogapɨ moss	waapi juniper waapi *J. utahensis* kusiwaapi cedar paawaapi water juniper sanabi junper sohobi tree sohobi cottonwood sɨnabi narrow-leaf cottonwood sagapi willow eŋgakʷizuni?i birch šɨhɨbi willows	tono?opi greasewood pohobi *Artemesia* sibapi rabbit-brush eiwadabisia-pɨ small rabbit brush kai?nambi a rabbitbrush tɨmaiyɨha mansanita puhibahmu tobacco wooweibi peyote tɨbaheinatusu penis medicine etc.	

Figure 12: Shoshoni Category Things that Are Not Eaten (A)

designated generally by color. Other <u>things that are no good</u> include named varieties of mullen (introduced) called "mountain's penis" [tóyabi tɨbɨʔa], dodder [úbasapiaBɨ] "barren women plant" (some have heard of its contraceptive properties), ground cherry [tábuakicaʔa] (from to "mash" or "pop" also used for varieties of <u>Astragalus</u>, all of which pop when broken), common poverty weed [túdumziipi], etc. Unnamed varieties are merely referred to as [kíhi núzandɨ] or [kíi nánzana] "no good."

<u>Grasses</u> [sónipɨ] or [wáʔabi] include salt grass [tɨ́siipɨ], rye grass [sónipi] and giant rye grass [píasonipɨ], as well as other unnamed species called merely [sónipɨ] or [waabi]. Water plants [puhipoʔnoʔo] include <u>Equisitum</u> called either [sóʔwiʔwihi] or [páawoʔeinu] "water whistle" and algae or pond scum [páiʔyogapɨ].

<u>Trees</u> (no cover term) include two pines, said to be related to each other: [tɨ́ba] single-needled pinyon and [wóŋoʔoβi]; junipers [wáapi], including <u>Juniperus utahensis</u> [wáapi], cedar [kúsiwaapi], water juniper [paawaapi], and Rocky Mountain juniper [sánabi]; and several deciduous species, called [sóhobi] for cottonwood tree, and also thought to be related: black cottonwood [sóhobi], aspen [sɨ́nabi], narrowleaf cottonwood [ságapi], red birch [éŋgakʷizuniʔi] and alder (?) [húgwiǰapɨ]. <u>Willows</u> [sɨ́hɨbi] are also grouped together and further sub-divided for color, such as gray willow [kúsisɨhɨbi], etc. Only certain willows were used in basketry.

The category medicine [nátusu] groups together several named types with no further subdivisions. Some of these are: greasewood [tóno?opi], Rhumex [éŋgapawia], Angelica (?) [páso?ogoipɨ], bitterbrush [hɨ́na?abi], balsam [tóoza?a], nettle [páiŋka], St. John's wart [ándadicikwana?a], etc. Poison parsnip [háate?e], used to commit suicide, is also placed in this category, apparently for its important properties. Tobacco [púhibahMu] ~ [púhiba] and mansanita [tɨ́maiyɨha], the agent used to cut the strength of tobacco, are also considered medicines, although they can be smoked for pleasure. Other named varieties of medicines are listed in Figure 12.

The movers [nɨ́midɨdɨ] that are not eaten include members of the categories those with fur [pɨ́hɨhgantɨ], things that fly [yɨ́cɨnadɨ], things that crawl [núyuantɨ], birds [húču?u] and things in the water [páakupantɨ]. Of those with fur, wolf [íza], coyote [íǰapɨ?ɨ] and red fox [wáa?ni] are said to be related, as are brown bear [pádua] and black bear [wɨ́da?a]. The cats [túku?u], including bobcat [túkupɨci] and mountain lion [tóyatuku?u] are also related. Other animals with fur are named individually, and the names usually stand for whole genera of animals. Small mice are called [pámohe?ya], mink [túupamponai], weasel [pábici] and striped skunk [póneci].

Things that fly include flying insects, such as common fly [ánimui], bumblebee [hɨ́bimoo], yellow jacket [péina], mosquito [wópo?o] and mosquito [wá?wa?ada]. Birds [húču?u] include three groups of big birds [píahucu?u] and several

Things that are not Eaten kíi nádɨkadɨ								
things that grow/plants sɨaka ∿ tɨ́ma sɨáŋkɨpɨ	things that move about nɨ́midɨdɨ							
	things that have fur pɨhɨganti	things that fly yɨ́cɨnadi			things that crawl núyuantɨ			things in the water páakupantɨ
			húcu'u birds		tógo'a snake	pogozi'ya lizard	wanaso'aci spider	
	íza wolf wáa'ni red fox ɨ́japɨ'ɨ coyote pádua bear wɨ́da'a black bear	ánimui fly hɨ́bimoo bumble bee péina yellow-jacket mópo'o mosquito wá'wa'ada mosquito	píahucu'u big birds k^{W}ínna'a big birds	hucu'u little birds	tógo'a rattler etc. páasunu-wiyo water snake	mácangina'a horned toad pógozi'ya gray lizard etc.	ćícici gray spider etc.	wága'ni'a frogs
	túku'u cats		kwínna'a eagle páag^{W}ina'a osprey wíkombici buzzard kíni'i chicken hawk tómopɨ hawk panzai'ya hawk	híto'o meadow lark súikuka robbin káiyaci blue jay k^{W}ídabu magpie tɨ́'wi'i killdeer hái raven k^{W}í'ada crow páganzuku blackbird sái'aganzuku redwinged etc.				peng^{W}i fish
	túkupɨci wildcat toya tuku'u mountain lion		mu'umbi owl					puhiwo'o minnows picoda "crab"
	poneci skunk pabici weasel etc.		mu'umbi owl kuhu'u burrowing sibatukuwɨna screech owl					

Figure 13: Shoshoni Category Things that are not Eaten. (B)

small birds named individually. The groups of big birds are: those related to eagles [kʷína?a], including "big eagle" [píagʷina?a], osprey [páagwina?a] "water eagle" and buzzard [wíkombici]; hawks (no cover term but often also described as a sub-category of eagles), including chicken hawk [kíni?i], dark hawk [tómopɨ] and a third unidentified large hawk [pán-zai?ya]; and owls [mú?umbi], including barn owl [mú?umbi], borrowing owl [kúhu?u] and great horned owl [síbatukuwɨna]. For the other birds, only one other grouping is made, that of black birds [túhuču?u], including raven [hái], crow [kʷí?ada], blackbird [páganzuku], and redwinged blackbird, called "tule blackbird" [sá·ibaganzuku]. Other birds named individually include meadow lark [híto?o], robbin [súikuju], blue jay [káiyaci], magpie [kʷídabu], killdeer [tɨ?wí?i] and king-fisher [piŋwinzada] for a partial list. Bats [hóinobici] are also thought to be birds or related to birds by most informants.

Things that crawl [núyuantɨ] include lizards [pógo-zi?ya], spiders [wánaso?aci], snakes that are poisonous, such as rattlesnake [tógo?a] and non-poisonous, such as water snake [páasunuwiyo], and insects (no cover term) named separately, such as louse [púzi?a] and grasshopper [átaŋgi?i]. Horned toad [mácaŋgina?a] is considered a lizard.

The last category, things in the water [páakupanɨ], includes generic terms for frogs [wága?ni?a], fish [péŋkʷi], minnows [púhiwo?o] and "crabs" [pícoda] (crayfish).

E. The Southern Paiute Classification

Keeping in mind some of the characteristics of the Northern Paiute and Shoshoni classification schemes, we will now look at the Southern Paiute systems. As noted above, classifications were elicited in several areas within the historically known range of the Southern Paiute, from persons representing remnant groups of those once occupying these areas. By so doing, an attempt was made to maximize the possible influences on the classifications of the diverse environmental and cultural features of early Southern Paiute territory. With language influences held relatively constant, differences attributable to these other two features might be more readily apparent. We will first examine one of the classifications in some detail--that of the Cedar City Southern Paiute. We will then compare it to others elicited in other areas.

1. Cedar City Southern Paiute Classification

Starting with the initial frame [tɨwíipɨ madókɨnapɨhantɨ], "what God put on this earth,"[11] or some near equivalent, Southern Paiute informants from the Cedar City area first segregated two basic classes of phenomena: what's eaten [tɨkápɨ] and what's not eaten [káa tɨkáʔapɨ]. These designations are semantic cognates of the Northern Paiute and Shoshoni categories things that are eaten and things that are not eaten (Northern Paiute [kái nadɨ́kadɨ] is an alterna-

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[11]This sentence is undoubtedly post-Mormon in influence. "God" here is from [kɨnuni], FaFa, etc., an interesting extension of meaning.

tive; Shoshoni form [kíi nadɨkadɨ]). Additional terms recorded from Cedar City informants include [nɨŋʷɨ́ tɨkápɨ] "Indian's food" and [káa tɨdɨkáwapɨ] "don't eat it" as well as other similar phrases. These further stress the importance of the overall concept of use for the Southern Paiute in taxonomic ordering, as well as for Numic people generally.

The next major division of the natural phenomena made within both the eaten and not eaten categories is based on a generalized "plant" vs. "animal" distinction, as in Northern Paiute. The Southern Paiute use a pair of terms to label these categories that differ from the Northern Paiute concepts and are apparently root expressions. These are [maʔábɨ] "plants" and [paʔábi] "animals." Whereas in Northern Paiute the terms [náadɨ], literally "grower" and [yɨcɨ́ŋadɨ], literally "mover" can be applied to refer to designates outside the plant/animal sphere, Southern Paiute [maʔábɨ] and [paʔábi] refer only to these domains. They do not necessarily have the same meaning in all Southern Paiute areas and to all speakers, but they are nonetheless clearly connected to these domains alone.

The presence of these clearly marked concepts in Southern Paiute seems to have certain effects on the classification schemes, especially on the intersection of the use criterion with the biomorphological dimension plant/animal. Whereas in Northern Paiute, use clearly takes precedence over distinctions made on other grounds, in Southern Paiute, this precedence is not always as primary. Use is certainly important to Southern Paiute speakers, and does serve as a maximal

WHAT GOD PUT ON THE EARTH tɨwiipɨ madokɨnapɨhantɨ				
What's eaten nɨŋ^{w}ɨ tɨkapɨ ~ tɨkapɨ	Plants ma?abɨ	ground plants tɨwiipɨ ma?abɨ ma?abɨ	sticker plants	manama?abɨ
			roots	tɨna?ak^{w}ɨ
			leaves	nanka
			berries	tapunikantɨ
			seeds	pu?ibi
		water plants paa ma?abɨ		
	Animals pa?abi		lizards	sɨgɨpicu
			birds	wicici
			fish	pagɨ?ɨci
			those with fur	pɨɨgantɨ
			those with horns	?aapɨgantɨ
What's not eaten kaa tɨka?apɨ ~ kaa tɨkawapɨ	Plants ma?abɨ	ground plants tɨwiipɨ ma?abɨ	weeds	pɨɨpɨni ɨpɨ ma?abɨ
			wild grass	tɨda uk^{w}iibɨ
			desert brush	yuama?abɨ
			flowers	ma?asinkapɨ
			trees	ma?abɨ wɨnɨdɨ
		water plants paama?abɨ		
	Animals pa?abi		worms	pa?ba?abi
			bugs	pa?abi
			reptiles	nanapabimpɨ
			fish	pagɨ?ɨci
			birds	wicici
			those with fur	pɨɨgantɨ

Figure 14: Cedar City Southern Paiute General Categories

orientation for their schemes, but it can also be subordinated in discussions to considerations of [ma?ábɨ] and [pa?ábi] as biomorphological categories. Expressions such as [máisak^{w}abɨ ma?ábɨ], "all the plants" and [tuwíipɨa pa?ábi], "all the animals of the earth" were recorded in texts from the Cedar City area. J. P. Harrington (Hill 1969:23) also recorded from a Chemehuevi speaker [təvípəa̦ maha] "all of the plants" and [təvípəa pa'a] "all the people and animals that live on the earth." These domains thus seem to have a separate reality apart from use that can be more easily expressed in Southern Paiute than in Northern Paiute or in Shoshoni.[12] The alternatives of taxonomic ordering posed by these conceptions can cause confusion in discussions, as will be noted below.

Just as the terms "plant" and "animal" may operate at different levels of specificity in English, so [ma?ábɨ] and [pa?ábi] follow a similar pattern in Southern Paiute. This adds to the complexities of defining the terms with precision. In the most inclusive sense, these two terms form a contrast set, i.e. plants, as defined in English by informants, are "all green growth, including flowers and trees" and animals are "all creatures except man and plants" (see also Harrington's definition, quoted above). On the least

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[12]There is, of course, rather extensive literature debating the question of the importance of the presence of terms to concept formation and cognition [see for example, Lenneberg and Roberts (1956)]. My impressions here are admittedly subjective, but there does seem to be a difference between Southern Paiute and Northern Paiute discussions.

inclusive level, [maʔábɨ] may be used in compounds to designate specific plant species, such as [muʔí maʔábɨ] "milk weed (plant)" (Asclepia spp.), and [paʔábi] may stand for any unspecified or unnamed crawling insect or "bug." Within these broad definitions, there is also a tendency for informants from different Southern Paiute areas, from different subcultural backgrounds and, perhaps, with different personal experiences to narrow the focus of meaning for the terms to common usage. Thus [maʔábɨ] and [paʔábi] used in conversations outside formal discussions of taxonomies mean slightly different things in various areas and to various speakers. These differences are summarized in terms of the contrasts the terms produce and their use as class labels in Figure 24. The common dialect referents for the terms will be discussed in a later section.

a. What's Eaten. Beginning at the most inclusive level, the what's eaten classes of [maʔábɨ] for the Cedar City Southern Paiute are of two basic types: [maʔábɨ], here used at a different level of contrast for ground plants (also called [tuwíipɨ maʔábɨ] and [páa maʔábɨ] water plants. Figure 15 gives the classification of these two types.

Within the eaten ground plants, there are several categories, based on the part of the plant utilized, as in Northern Paiute. These are: seeds [puʔíbi] or things that have seeds [puʔíagantɨ], things that have berries [tapunikantɨ], things that have leaves [náŋká] or [naŋkágantɨ], and things with roots [tɨná] or [tɨnáʔakwɨ] and sticker plants [manamaʔabɨ]. Three of these lexemes, i.e. seed, root and

What's Eaten nɨŋʷɨ tɨkapɨ ~ tɨkapɨ									
Plants maʔabɨ									Animals paʔabi
ground plants tɨwiipɨ maʔabɨ maʔabɨ								water plants paamaʔabɨ	
seeds puʔibi	berries tapunikantɨ	leaves naŋka	roots tɨnaʔakʷɨ	sticker plants manamaʔabɨ	nɨŋʷɨ tuʔu Orobanche	itampɨ mushroom	wahabɨ grass		
pabonokʷi ground cherry kʷigɨmpɨ thistle aka tansy puŋkuci pig weed paasɨ pig weed ʔopi mesquite kuʔu mentzelia akɨmpɨ sunflower kanɨmpɨ sunflwer akɨ sunflower cicagantɨ balsam wa.da seepweed etc.	tɨwampɨ service berry kunukʷi elderberry iyabi grape iʔisi sumac icɨ strawberry ciʔampibɨ rose tonopɨ choke-cherry aŋka uupi buck berry uupi Lycium paʔoipɨ water Lycium sɨna upipɨ coyote's lycium	tɨʔmadɨ Stanleya kʷicasi onion kʷibapi pig weed paʔoinumpɨ spinich cii onion muʔunci onion cɨna thistle	kɨŋkabɨ onion yampa potato wixcuna potato tuʔuna tuʔna biscuit root sigoʔo sego	uusi Yucca manabɨ prickly pear nabumpɨ barrel cactus				toʔibɨ cattail saimpibɨ tule pamumpɨ water cress	

Figure 15: Southern Paiute (Cedar City) Plant Categories (A)

leaf are cognate with the Northern Paiute category lexemes, while a fourth, berry, labels a cognate category but differs morphemically: [tapúnikantɨ] vs. [kamádɨ] (see also Shoshoni [húutɨkapi]). Sticker plants [manáma?abɨ], which include narrow-leaf yucca [úusi], a small barrel cactus [nabúmpɨ] and prickly pear [manábɨ] is not found as a category in Northern Paiute, probably for environmental reasons. In Shoshoni it is unlabeled. The Northern Paiute category flesh [?atukú] is not recognized in Southern Paiute, although one of its Northern Paiute members has a Southern Paiute cognate, i.e. Northern Paiute [tuhú] "Indian asparagus" or Orobanche californica is Southern Paiute [nɨŋʷɨ́ tu?ú], Orobanche fasciculata. This plant, along with mushroom [itámpɨ] is merely named as a variety of [ma?ábɨ] in Southern Paiute, and not further combined. The Northern Paiute term for mushroom [nɨmɨ́ n.aká] "Indian's ear" is a descriptive name and non-cognate with Southern Paiute [itámpɨ].

The Southern Paiute category seeds [pu?íbi] includes a number of named varieties, including pigweed [kumútɨ], Amaranth [páasɨ], a thistle (Cirsium sp.) [kʷigɨ́mpɨ], tansy mustard [aqá], acorns [tá?mompi], ground cherry [pabónokʷi], Mentzelia [kú?u], rice grass [wa?áibɨ] and others. Many of these have Northern Paiute and Shoshoni cognates, as we shall see in Chapter V. In addition to these individually named varieties, two, including grass [wáabɨ] and sunflower [akɨ́mpɨ] can be further subdivided. Sunflowers [akɨ́mpɨ] include: [akɨ́mpɨ] (Heleanthus annus), [kaŋɨ́mpɨ] (H. petiolaris), and [cičágantɨ] (Balsamorhiza saggitata) (see Figure 14). Grass [wáabɨ] includes species of Poa, Stipa and Elymus and intersects with the category seeds.

The category berries [tapúnikantɨ] has several named varieties, including chokecherry [tonópɨ], yellow currant [pahóbimpɨ], blue elderberry [kunú] or [kunúkʷi], service berry [tɨábɨ] or [tɨwábɨ], wild grape [iyábi], strawberry [icɨ́] and [nagá tocíbɨ] (literally "mountain sheep's testicles"), wild rose hips [ciʔámpibɨ], etc. The fruit of squawbush (Rhus trilobata), called [iʔíšɨ] is also included, while the stems from this plant, used in basketry are named and categorized separately. One of the berries also has subdivisions: [uʔúpi] is used as a cover term for [sɨná uʔúpi] "coyote's Lycium" (Lycium cooperi), [páʔu.pipɨ] "water Lycium" or [aŋká ú.pi] "red Lycium" (Sheperdia argenta) and [uʔúpi] Lycium andersonii.

Leaves [naŋká] include the tender young portions of plants gathered in the spring, as well as varieties of onions (leaves also eaten). Members include: prince's plume (Stanleya pinnata) [tɨʔmádɨ], pigweed [kʷibápi] and thistles [ciná] as well as the onions [kʷičási] (Allium parvum), [cíi] and [muʔúnci] (Allium spp.). Roots [tɨná] include bulbs of another onion [kɨŋkábɨ] (A. accuminatum), and other roots such as "Indian potato" [yámpa] (Carum gardinairi), a second "Indian potato" [wihčúnaʔa] (Orogenia linearifolia), biscuit root [tuʔúna] or [túʔna] (Lomatium sp.), sego lily bulbs [sigóʔo], etc. Again, many of the terms have Northern Paiute and Shoshoni cognates (see Chapter V).

In addition to these ground plants [maʔábɨ] that are eaten, there are also water plants [páa máʔábɨ] in this category. These are separated from the others because of habitat, but not further subdivided according to the part used. They include in the Cedar City area: cattail [toʔóibɨ], tule [sáimpibɨ], and water cress [pamúmpɨ]. The uses of these for subsistence are similar to those in other Numic areas, i.e. the base of tule and cattail stalks are eaten, as are the leaves of watercress. Cattail and tule seeds, however, are not considered important foods in this area.

The edible animals [paʔábi] for the Cedar City Southern Paiute include the following categories: those with horns [ʔáapɨgantɨ], those with fur [pɨ́ɨagantɨ], fish [pagɨ́ʔɨci], lizards [sɨgɨ́piču], and birds [wičíci]. The taxonomy for this category is presented in Figure 16. Additional animal categories are given in other sections. There is apparently no intermediate level categorization of these into land and water forms, paralleling the plant distinctions. The categories are established on mixed bases of physical characteristics, habitat, etc., as in Northern Paiute and Shoshoni.

The category those with horns [ʔáapɨgantɨ] includes the following, named individually: moose [páyukuci], elk [padɨɨi] (literally "water deer"), deer [tɨʔí], antelope [wancí], a mythological spotted deer [páiyukuci], and mountain sheep [nagá]. Buffalo [tɨdá kuucú] or "wild cow"[13] and

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[13]The term [kucu], formerly "bison" is now used for the more familiar introduced cattle. The former meaning is

things that are eaten tɨkapɨ ~ nɨŋ^{w}ɨ tɨkapɨ								
Plants ma?abɨ	Animals pa?abi							
	those with ?aapɨgantɨ horns	those with fur pɨɨgantɨ		lizards sɨgɨpicu	birds wiči̇ci		fish pagɨ?ɨci	wahata leopard frog
	payukuci moose padɨ?i elk tɨ?i deer wanci antelope paiyukuci spotted deer naga mt. sheep tɨdakucu buffalo tɨdapigici peccary	to?incoci rabbits tabuci cotton-tail kamɨ jackrabbit tohakamɨ snoeshoe sɨkuci squirrels kɨmpaci ground squirrel sɨkuci squirrel aŋkak^{w}asɨ sɨkuci red-tailed squirrel aiyapɨci prairie dog	ya?ampɨcɨ marmot yɨ?ɨmpɨcɨ porcupine unampɨci badger tuk^{w}apidɨ racoon paŋkoicaci muskrat paunci beaver kaaci packrat mɨyɨmɨci gopher	ca?wadɨ chuck-walla	high birds pa?awicici ?ump^{w}ici flammulated owl cako.da goose	low birds toponok^{w}a wiči̇ci cǐca?a sagehen ka?ampɨci pinehen aiyobɨ dove kakadampɨci quail cɨga duck oocɨga mallard uwucɨga mudhen	aŋkapagɨci red trout pagɨ?ɨci trout	

Figure 16: Southern Paiute (Cedar City) Animal Categories (A)

peccary [tɨdá pigíci] "wild pig" (English "pig"), are also included by those who have had direct experience with these animals.

This category is particularly interesting for three reasons: first, it parallels closely the Northern Paiute grouping of these animals as <u>those with hooves</u> [tosɨ́gɨgaʔyu]. Both distinctions, i.e. <u>hoofed</u> and <u>horned</u>, fit the same list of biological species, merely calling attention to different shared characteristics. Secondly, several Cedar City informants recorded the animals with horns in the order noted above, apparently referring to size. They claimed that these animals are all "brothers," and that the kinship terms <u>younger brother</u> [pinácicaicina] and <u>older brother</u> [namɨ́puma] can be used to refer to them. The point of reference for the usage, or ego, is <u>deer</u>. Younger brothers are those smaller than deer, older brothers those larger than deer. The use of deer as a focal point may result from deer being the most important single animal hunted by these people--in pre-contact times as well as today. No other strongly kin-based relationships were recorded in the taxonomies, although Goss (1967) has reported some interesting data for Ute in kin-myth based categories.

A third interesting dimension to this category is the inclusion of a mythological member [paiyukuci], spotted deer. Such inclusions occurred on more than one occasion, and for

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thus expressed by the modifier [tɨda] "wild" to indicate the "native" animal.

other categories. The importance of mythology as a possible semantic component will be noted again in Chapter V.

The category <u>those</u> <u>with</u> <u>fur</u> [pɨ́ɨagantɨ] groups together a number of small animals, including rabbits [to'ínco-ci] of several named varieties, such as cottontail [tabúci], jack rabbit or hare [kamɨ́] or [kamɨ́nci] and snowshoe rabbit [tosá kamɨ́], as well as other fur-bearing species. Of these, three sub-groups are felt to be "related," but are not necessarily separately labeled. These are: 1) <u>squirrels</u>, sometimes referred to collectively as [sɨkú], including ground squirrel [kɨ́mpaci], gray squirrel [sɨkúci], gopher [mɨyɨ́mɨci], "red-tailed" squirrel [aŋká kʷáasɨ] and prairie dog [áiyapɨ-ci]; 2) marmot [ya'ámpɨci], badger [unápɨci] and porcupine [yɨ'ɨ́mpɨci]; and 3) muskrat [paŋkóicaci] and beaver [páunci]. Again the existence of so-called "unmarked categories" is a feature of many native taxonomies (Berlin, Breedlove and Raven 1968).

The Southern Paiute category <u>birds</u> [wičíci] has two subdivisions based on flight habits, paralleling those in Northern Paiute. These are <u>high</u> <u>birds</u> [pa'áwičíci] and <u>low</u> <u>birds</u> [topónokʷa wičíci] (see Figure 16). As in Northern Paiute, those birds that soar high in the sky or live high in trees are placed in the <u>high</u> category, and those that fly only short distances at low altitudes are placed in the <u>low</u> category. The <u>high</u> <u>birds</u> that are <u>eaten</u> are: flammulated owl [mu'úmpuwici] and goose [cakóda]. The <u>low-flying</u> edible birds are: sagehen [cičá'a], pine hen [ka'ámpɨci], dove [aiyóbɨ], etc. <u>Ducks</u> [cɨgá] are also considered low fliers, and are of several named varieties, including mud hen [uwúcɨ-ga], mallard [óocɨga], etc. Mud hens are said to get so heavy from feeding in the summer that they are no longer able to fly. They were hunted during this season in drives using nets, clubs, etc., as for rabbits.

Fish [pagɨ́ʔɨci] include only cutthroat trout or "red trout" [aŋká pagɨci] and mountain trout [pagɨ́ci] in the eaten category. Others that are not eaten are listed in Figure 18. Groups from other Southern Paiute areas, and especially the Chemehuevi who were "fish (eating) people" [pagɨ́nɨŋʷɨ̀vɨ] list additional eaten varieties. Leopard frog [waháta] was also eaten, but is not placed in a separate category. Lizards [sɨgɨ́pič́u] used as food include only the chuckawalla [caʔwáda] in this area.

b. What's Not Eaten. The category what's not eaten [káa tɨkáʔapɨ] has some of the same divisions as the eaten category, but also others that differ. For the plants, the ground and water categories remain, but the sub-categories of these differ. For the animals most of the sub-categories of eaten varieties also have not eaten members. However, several additional sub-categories are also recognized (see Figure 17.

The bases for distinction of ground plants in the not eaten category are mixed. Some are distinguished because of morphological similarities, others for habitat, and yet others for use. The following divisions are recognized: trees [maʔábɨ wɨnɨ́dɨ], flowers [maʔásiŋkapɨ], desert brush [yúa maʔábɨ], wild grass [tɨdá ukʷíibɨ] and weeds [pɨɨpɨni]

What's not eaten kaa tɨkapɨ ~ kaa tɨkawapɨ							
Plants maʔabɨ							
tɨwiipɨ maʔabɨ ground plants							water plants paamaʔabɨ
trees maʔabɨ wɨnɨdɨ		flowers maʔasɨŋkapɨ	desert brush yuamaʔabɨ	wild grass tɨda uk^{w}iibɨ	weeds ɨpɨ maʔabɨ	medicine musutuk^{w}i	
tɨbapɨ single- needled pinyon padɨbapi double needled pinyon yuwimpɨ spruce waʔaɨ juniper panwaʔapɨ arborvitae ataŋk^{w}ɨsibɨ yellowpine ogompɨ pine soobipɨ cottonwood sɨabɨ aspen sagapɨ willow kučasi soo- bipɨ sil- ver maple	pak^{w}iabɨ maple k^{w}iabɨ oak paweiabɨ elm tunampɨ mt. maho- gany aŋkasɨʔɨ- bimpɨ birch	tohaʔamaʔabɨ columbine owasiŋkadɨ paint brush etc. puʔuyaci lupin pi.maʔabɨ mullein tobasiŋkaci gentian	makata maʔabɨ horned toad brush tutupi ephedra tonobɨ greasewood kučatonompɨ gray grease- wood saŋ^{w}abɨ big sage k^{w}ičapo sa- ŋ^{w}abɨ roan sage pabicibɨ white sage sigumpɨ rabbitbrush yuʔanɨmpɨ Tetrademia iši sɨkumpɨ gray rabbit- brush ontosɨkumpɨ matchbrush	kaiba uk^{w}iibɨ mt. grass uk^{w}isiibɨ salt grass waʔabɨ grass paŋwaʔabɨ lawn uk^{w}iibɨ grass	muʔi maʔabɨ milk weed ʔanokumpɨ gourd yantɨ thistle nasaʔasi mint kanɨnɨmpɨ prickly poppy etc.	tončabɨ balsam togosampi- bɨ palmer penstamin momopɨ jimson pagubɨ snake root tutupi ephedra kakupɨ horse medicne kananasasi mint toʔapakaici 4o'clock sag^{w}ag^{w}oapɨ tobacco ɨnapɨ- cliffrose etc.	pakampɨ cane kanabɨ willow pakanabɨ water willow paʔowiibɨ rushes pasawabɨ moss etc.

Figure 17: Southern Paiute (Cedar City) Plant Cagegories (B)

or [ɨ́pɨ ma?ábɨ], literally "bad plants." In addition, some varieties also stand alone, without further categorization.

The category trees [ma?ábɨ wɨnɨ́dɨ] brings together several large species of "standing plants" (from wɨnɨ-/ "to stand"). As will be noted later, in the discussion of the regional variants in Southern Paiute taxonomies, the Cedar City people hesitate to apply the term [ma?ábɨ] without a qualifier to "large trees." When identifying trees in the field, they frequently refer to them by location, or some other description, without the accompanying [ma?ábɨ] designation, e.g. [pawɨ́hamɨ wɨnɨ́dɨ] "ones by the water standing" or [pa?ántɨ wɨnɨ́dɨ] "tall ones standing." As the designation [ma?ábɨ wɨnɨ́dɨ] was recorded only in the context of taxonomic discussions, it may be somewhat artificial. There apparently is no clear-cut term for "tree" in any of the Numic languages, as will be noted later (Chapter V).

Although there are no named sub-categories of trees recognized by the Cedar City Southern Paiute, several sets of species are felt to be closely related. These include the pines-firs-junipers and some sets of deciduous trees. The pines-firs-junipers in this area include limber pine [atáŋk^{w}i-sibɨ], douglas fir [ogómpɨ], ponderosa pine [yuwímpɨ], single-needled pinyon [tɨbápi], double-needled pinyon [pádɨ-bapi], Utah juniper [wa?ápɨ] and one-seeded juniper [páŋwa?a-pɨ]. Of these, the two pinyons are said to be most closely related with the pinyons and junipers at the next order of closeness. The grouping of pinyons and junipers is again based on growth association as in Northern Paiute. According to informants, these species are always seen together and apart from other pines. Based on the criterion of <u>use</u>, manzanita [adádampibɨ] is also said to be "related" to junipers as both are used in smoking.

A number of deciduous trees are also recognized as related, but no class labels were provided to indicate this status. These include two major groupings: 1) aspen [sɨábɨ], narrow-leaf cottonwood [sagápɨ], broad-leaf cottonwood [sóobipɨ], silver maple (introduced) [kučá sóobipɨ] literally "dusty" or "ashen cottonwood," and birch [aŋkásɨʔɨbɨ] or "red willow"; and 2) scrub oak [k^wiábɨ] and maple [pak^{w}íabɨ] or "water oak." Several others stand alone, including mountain mahogany [tunámpɨ], locust [piásɨcampibɨ], and an unidentified tree species [makóbimpɨ].

The category <u>flowers</u> [maʔásiŋkapɨ] includes some named varieties, such as prickly poppy [kanɨ́nɨmpɨ], cleome [sog^{w}ánabɨ] literally "under-arm smell" and lupine [púʔuyaci], as well as many others described for color or some other peculiarity. Examples are ragweed [sag^{w}ámaʔabɨ], called "blue plant," scarlet gilia [aŋkámaʔabɨ] "red plant," as well as several other species of "yellow flowers" [owásiŋkadɨ] and "white flowers" [tohá ʔasiŋkadɨ]. Others are described by habitat, as for example columbine, designated as [pawɨ́hamɨ siŋkadɨ] "by the water flower," by some informants, but as "white flowers" by others. These names tend to be variable from informant to informant.

The category <u>desert brush</u> [yúa maʔábɨ] brings together several small desert shrubs, grouped for size and growth association. The term is from [yua-], "desert, plain" and the form for plant. Members include individually named types, such as Ephedra [tutúpi], greasewoods of two kinds [tonóbɨ] (Sarcobatus baileyii) and [kuča tonóbɨ] (S. vermiculatus), "horned toad bush" [makáta maʔábɨci], sages of several kinds, sub-grouped as [saŋwábɨ], and including [saŋʷábɨ] or big sagebrush, "red sage" [aŋkápo saŋʷabɨ], "roan sage" [kʷíčápo saŋʷábɨ], white sage [pabícibɨ] and a second sub-grouping rabbit brushes [sɨkúmpɨ], including Chrysotahmnus viscidiflorus [sɨkúmpɨ], C. nauseosus [iší sɨkúmpɨ], matchbrush [ontósɨkumpɨ] (Gutierrezia sarothrae), the Tetrademia spp. [yuʔánɨmpɨ] and [káiba yuʔánɨmpɨ] and [monómpɨ] (Solidago spp.). All of the latter are yellow-flowered in the late summer and fall.

The terms grass [hukʷísibɨ] and "wild grass" [tɨdá ʔukʷíibɨ] can be applied to numerous species of unused grasses. These can be subdivided according to habitat, into "mountain grasses" [káiba ʔukʷíibɨ] and "valley or desert" grasses [yuʔákʷisíbɨ]. [wáabɨ́] [waʔábɨ], most often applied to Elymus spp. is also a term for large grasses. [páŋwaʔabɨ] or "water grass" can be applied to rushes and to green lawns in cities.

The category weeds [pɨ́ɨpɨni] or [ɨ́pɨ maʔábɨ] "bad plants" includes several species that are individually named, such as fetid gourd (Cucurbita foetidissima) [ʔanókumpɨ], russian thistle [yántɨ], a sweet smelling mountain plant [nasáʔasi] and milkweed [muʔí maʔábɨ]. Mullen, an introduced plant common to roadsides is called by various descriptive names, including [píima?abɨ] "big plant," [naŋkábama?abɨ] "ear plant" or [aŋkánaŋkabɨ ma?ábɨ] "red-eared plant." Lichens are called either [tɨmpí ma?ábɨ] "rock plants" or [tɨmpí sanókobɨ] "rock gum." Several flowers are also classed as weeds, so that these categories intersect.

In addition to these categories of ground plants that are not eaten, Southern Paiute informants also recognize a general class of medicine plants [musútukʷima?abɨ], also on the basis of use rather than morphology. Some of the members here also fall within other categories defined on the basis of morphology, so that except for their use as medicine, they may be otherwise defined. Some names are descriptive, such as, for example, mint [pakánanumpɨ] "water smelling," [koč́á musútukwibi] "testes medicine" (Scarlet gilia) and mistletoe [sagʷímusutukwi] "belly medicine." Others are apparently root terms and have cognate forms in other Numic languages, i.e. Ephedra [tutúpi], bitterbrush [ɨnápɨ], balsam root [tón-cabɨ], jimson weed [momópɨ], etc. Tobacco [sagʷágʷo?apɨ] is also considered a medicine, although it may be smoked for pleasure. No sub-categorization of medicinal plants other than that apparent in the descriptive names was volunteered by informants. Other medicinal plants are listed in Figure 17.

In addition to medicine plants, informants also listed several other plants with uses, as, for example, in basketry, but did not volunteer a cover term for these. Nor did they combine these with medicines into a macro-category of things that are used as did Northern Paiute informants.

They preferred to list them separately, noting that they were *not eaten* except for specific purposes and at specific times; they might be referred to as *weeds*. They noted that medicines could even be considered in some senses *weeds* (one lady called them [musútukwi "wíiz"] ("medicine 'weeds.'") Plants used in basketry include squawbush [sɨʔɨ́bi], devil's horn [túu sɨ́ɨbimpɨ], willows [kanábɨ], honeysuckle [tampísudupi], and [káibɨ sɨʔɨ́bi] (unidentified).

The *not eaten water plants* [páa maʔábɨ] are listed without further subdivisions by the Cedar City Southern Paiute. They include cane [págampɨ], "water willows" [paká-nabɨ], rushes [paʔáŋʷiibɨ] and algae [pasáwabɨ].

Animals [paʔábi] in the *not eaten* category are subdivided into several classes, primarily on the basis of morphology. Some of these are the same as those for *eaten* animals, and will be referred to only briefly. Others represent additional classes not found in the *eaten* branch (see Figure 18).

The category *things with horns* is not represented here, as all the horned animals in the Great Basin were hunted as food. Animals *with fur* [pɨhɨ́gantɨ], also represented in the *eaten* category, have some additional subdivisions here, not all of which are labeled. The categories are: 1) *cats* [tukúci], including wild cat [tukúci], lynx [mosóntukuci] and mountain lion [piáduku];]) *dogs* (no class label) including native dog [sadɨ́ʔɨci], coyote [yokópɨci] (myth name, from /yoko- / "intercourse") or [sɨnáʔabi] and wolf [piá sɨnáʔábɨ] "big coyote." (The latter two are

things that are not eaten kaa tɨkapɨ ~ kaa tɨkawapɨ →									
Animals						pa?abi →			
those with fur pɨɨgantɨ			birds wičici			fish pagɨ?ɨci	reptiles nanapabimpɨ →		
tukuci cats	poni skunk	bear kʷiagantɨ	pa?awičici high birds	toponokʷa wičici low	wicici little birds		lizards sɨgɨpiču	togoabɨ poisonous snake	kogompɨci non-poison-ous snake
tukuci wildcat mosontu-kuci lynx piaduku-ci mt. lion	kabuniaci striped skunk pabuni big skunk tuwacini spotted skunk		kʷananci eagles kʷananci golden eagle pasi bald eagle wikumpɨci buzzard kusabi bullet hawk piyuci hawk kɨdinankai sparrow hawk etc. muupɨci owl wanakʷici screech owl mukuguci burrowing	wɨɨci roadrunner icoci meadow lark kʷaiyaci magpai	ananci pinyon jay togo blue bird caiyakaci scrub jay nancu?uci blue bird ogoncaiya-kaci ci.kunumpɨ robbin kʷici towhee tɨmpi kiɨ-soci canyon wren tuupicagbɨ blackbird kɨmanaci criole kanawičici yellow warbler etc.	moncoci catfish	nagapa?abi blue-tailed lizard mugʷi whiptail makataci horned lizard cana desert spiny cɨ?ai leopard lizard nɨŋʷɨ madɨnampɨ collared lizard	togoabɨ rattler wɨsɨnici sidewinder piadogoabɨ rattler tɨmpi togo-abɨ centipede	kogompɨci blow snake pasiko watersnake sɨna king snake icimi garter sn.
yogopɨci coyote piasɨna?abi wolf tobaci wolf sadɨ?ɨci dog	pu?ičaci mice								
onciaci fox yamasaci kit fox pabicici weasel kaŋkoicici weasel oguntabatɨ ringtail cat	kɨ?ɨmpaci mouse taba?aci mouse o?ocic bird-mouse kaacu woodrat taba?aci chipmunk ocopici chipmunk ogontava?aci fir chip-munk								

Figure 18: Southern Paiute (Cedar City) Animal Categories (B)

- things that are not eaten
- kaa tɨkapɨ kaa tɨkawapɨ
- Animals paʔabi
- pɨkai tortoise
- pak^{w}anabi frog
- pasɨgɨminci salamander
- bugs paʔabi

ants anabi	flies muʋpicaci	bees	spiders hok^{w}ampɨ	worms pabaʔabi	lice poʔabi
toobi black ant tasiabi red ant anabi ants wɨsɨanaci flying ant	kaniapɨ deer fly sag^{w}a mu-pici horse fly anibi gnats muʔuanibi mosquito isukupasi flies	siʔimuʔudɨ bumble bee wɨcabi yellowjacket untowɨcabi wasp	ɨkacoci triantula antoɨkaçoci yellow triantula aŋkasowabɨ spider k^{w}asik^{w}ipampi scorpion	yuwimpaʔabi pine worm tohopaʔabi pine worm tɨvainak^{w}icaci earth worm	poʔabi louse siyupoʔabi white louse
	kɨbi locusts	paduci dragonfly kubicaci stinkbug adankapici grasshopper sagahadankaci green grasshopper aasiboci butterfly pasiŋki waterskater			
	kɨbi locust togoakɨ.bɨ locust makacaci cricket				

- tick makatabi
- etc.

Figure 18: Southern Paiute (Cedar City) Animal Categories (B) (Cont.)

"brothers" as defined by informants and as related in myths.) 3) <u>dog-like animals</u> (no class label), including fox [onciaci], kit fox [yamásaci], weasel [pabícici], weasel [kaŋkóicici] and ring-tail cat [ogúntabatɨ]; 4) <u>skunks</u> [poní], including striped skunk [kabúniaci], "big skunk" [pabúni], and spotted skunk (civit cat) [tuwácini]; and 5) <u>mice</u> [puʔíici], including chipmunk [tabáʔaci], two-striped chipmunk [ocópicici], fir chipmunk [ogóntabaʔaci], chipmunk [oʔócici], and rat [káacu]. Bear [kʷiyágantɨ] stands alone in the <u>things with fur</u> category.

<u>Birds</u> [wíčíci] are divided into three sub-categories here: <u>High birds</u> [paʔáwičici], <u>low or ground birds</u> [topónokʷa wíčíci] and "little birds" [wíčíci]. Within the <u>high birds</u> certain <u>big birds</u> [piáwíčíci] are set apart as related. These are: 1) the <u>eagles</u> [kʷananci], including bald eagle [paasi], whiteheaded eagle [paŋʷá], golden eagle [piágʷananci] and buzzard [wihkúmpɨci], their "brother"; 2) the <u>hawks</u>, called [kʷanáncici] "little eagles," including sparrow hawk [kɨdínankaci], redtailed hawk [aŋká kʷananci], night hawk [páanagʷaici] "big mouth," a small hawk [piyúci], bullet hawk [kusábi]; and 3) <u>owls</u> [múupɨci], including borrowing owl [mukúguci], screech owl [wanágʷici] and horned owl [múupɨci]. Except for the class <u>bluebirds</u> [sagʷáwíčíci], all other <u>high birds</u> are merely named with no further subdivisions. Some examples are magpie [kʷáiyaci], crow [hatápɨci], etc. (see Figure 18). Bluebirds [sagʷáwíčíci] include Arizona Jay [togo], pine nut jay [aŋánci], scrub jay [cáiyakaci], blue crested jay [ogóncaiyacaci] and blue bird [náncuʔuci].

Ground birds [topónokʷa wičíci] include only road-runner [wɨ́ɨ̌ci] and meadow lark [icóoci] in the not eaten category. Little birds [wičíci] are named for color, cry, or morphological characteristics (see list, Figure 18).

The qualification in the high birds category for size, i.e. [piá wičíci] "big birds" reflects the reluctance of Cedar City Southern Paiutes informants generally to apply the term [wicici] freely to all birds. In its most common denotation, the term is used for little birds, often unnamed, but not necessarily so. [piáwičíci], the qualified term, may reflect an extension of the term [wičíci] to "all birds" or things that fly and have feathers. The gloss "big-little birds" is probably more representative of the parameters of usage. An alternative term for the big birds is [kʷanánci], the term for "eagle" (see also Northern Paiute and Shoshoni).

Fish [pagɨ́ʔɨci] in the not eaten category include only one specifically named variety, the catfish [móncoci]. Other fish, such as minnows, are designated by the class label, or the class label plus a diminutive. Frogs [pakwá-nabi] and salamander [pasɨ́ʔgɨminci] (literally "water lizards") are named separately as other water creatures. Tadpoles are also recognized as frogs rather than as fish.

Additional sub-categories for animals in the not eaten division include: reptiles [nanapabimpɨ], "bugs" or insects [paʔabi] or [manóko niá] "all named together" and worms [pabáʔabi]. Reptiles [nanápabimpɨ] "different animals(?)" include snakes [togóabɨ] and lizards [sɨgɨ́piču]. The term for Great Basin rattlesnake [togóabɨ] can stand as a class label for all snakes. It also designates the subclass of poisonous snakes, including sidewinder [wɨsɨ́nici], "big" or timber rattler [piádogoabɨ], Great Basin rattler [togóabɨ] and centipede [tɨmpítogoa], said to be rattlesnake's "little brother." Other snakes are designated by the term for "blow snake" [kogómpɨci] and include king snake [sɨná], garter snake [ičími], "blow snake" [kogómpɨci], water snake [pasígo], etc.

The term lizards [sɨgɨ́piču] can be used as a class label for all small lizards, both named and unnamed. It is used most commonly to refer to various unnamed species, seen in the desert and foothill areas of Southern Paiute territory. The named lizards also grouped under this designation include whiptails [mugʷí], collared lizard [nɨŋʷɨ́ madɨ́nampi] "people chaser," desert spiny lizard [caŋá], blue tailed skink [nagá paʔábi] "dodging animal" and leopard lizard [pompócaci]. Horned toads [makátaci] are also recognized as lizards.

The insects or "bugs" are divided into several subcategories, based on morphology. These include spiders [hokʷámpɨ], ants [anábi], bees [wɨcábi], flies [múupicaci], lice [poʔábi], locusts [kɨ́bi] and butterflies [aasíboci]. All of the class labels are used freely for other unnamed members of their classes. Spiders [hukʷámpi] recognized by name are: tarantula [ɨkácoci], yellow tarantula [aŋkaɨkacoci], scorpion [kʷasíkʷipampɨ] "hits with tail" and [anásowabɨ] (unidentified). All small spiders are called [hokwácaci], literally "spider" plus "diminutive." Ants [anábi] include red ants [tasíabi], big black ants [tóobi], and flying ants [wɨsɨ́anaci]. [anábi], as a specific designate, is usually used for small black ants. Bees [wɨcábi] include bumble bee [si?ímu?udɨ], wasp [untówɨcabi], yellow jacket [paŋʷɨ́cabi] and honey bees [wɨcábi]. Flies [múupicaci] include deer fly [kaníapici], horse fly [kabámupici], blue bottle fly [sagʷámupici], gnats [aníbi], mosquito [mu?úanibi] and [sukúpasi] (unidentified) flies. [múupici] is the most commonly used term for all flies. The category lice [po?ábi] has but one other member in addition to itself: [siyúpo?abi] a "white louse." Informants noted that "only the Navajos have a white louse." Locusts [kɨ́.bi] include the designate locust [kɨ́.bi], a three-striped locust [togóakɨ.bi] ("rattlesnake locust" for its sound) and cricket [makácaci]. Grasshoppers [adáŋkapici] and leafhopper ("green grasshoppers") [sagáhadankapici] are said to be related to locusts. The term for butterflies [aasíboci] stands for all butterflies and moths. These can be further subdivided for color. Dragonflies are "water butterflies," [pa?ásiboci].

In addition to groupings of insects, several others are named individually: [kubícaci] "stink bug," waterskater [pasíŋka], woodtick [mahtábi] and "buffalo" bug [misóoci], a small bug said once to have been a buffalo ("once was a buffalo, now it's a kind of a bug"), a mythological reference.

Worms [pabá?abi] are also a separate focus with several named varieties. They are said to be related to snakes, as "little brothers." They include angle worms [pabá?abi], fir worm [yuwímpa.?abi] (lives on [yuwímpɨ]), pine worm [tohópa.ʔabi], "hair snake" [ɨbá.ʔabi] and earth worm [tɨmpí nakwícaci]. Caterpillars [wičɨ́ci] are defined as grubs [woʔábi], but also recognized as a stage in the metamorphosis of butterflies.

2. Other Southern Paiute Classifications.

As noted above, biotaxonomies were elicited from speakers resident in other environmental and cultural subareas of Southern Paiute territory, to note the possible influences of these parameters on the development of the systems. A partial system was also obtained from a Ute informant in central Utah as a further control of possible dialect specific semantic differences. Taxonomies for all areas bear overall resemblances, but differ in several details. These details may be important to considerations of the development of Numic biotaxonomic nomenclature (Chapter V), and possibly to postulating certain universals in the development of taxonomic systems generally. For this brief discussion, Chemehuevi and Kaibab data will be compared to the Cedar City system just outlined. The major category relationships of the systems from these areas are summarized in Figures 19-23.

As can be seen from the figures, the concept of <u>use</u> remains important in all Southern Paiute areas. Lexemes morphemically related to the <u>what's eaten/what's not eaten</u> designations were elicited from both Kaibab and Chemehuevi informants as well as from the central Utah speaker. All informants further subdivided these categories into <u>plants vs. animals</u> and labeled these units [maʔábɨ] and [paʔábi].

What's not Eaten kaa tɨkapɨ				
What's Eaten tɨkapɨ	Fish pagɨʔɨču			
	Birds wičiči	high birds paʔaniwičiči		
		sky birds tuguwičicadampɨ		
		low birds tuk^{w}abaʔwičicadampɨ		
	Ground Animals paʔabi	Game animals pisabibimɨ		
		lizards sɨqɨpicu		
		crawlers paʔabi		
	What's Planted ɨapɨ			
	Plants mahabi	water plants paamahabɨ		
		earth plants tɨwiipɨ mahabɨ	mushrooms hitadɨ	
			herbacious plants tɨsɨ ~ tɨvicipici	seeds puʔiaka
				leaves nankaka
				roots tɨnaka
			thorny plants manabɨ	
			trees and bushes mahabɨ	

Figure 19: Chemehuevi Categories: What's Eaten

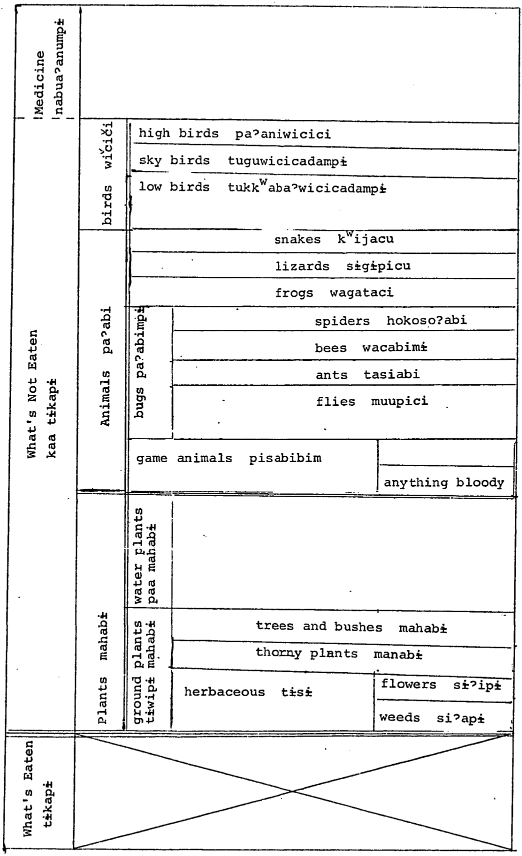

Figure 20: Chemehuevi Categories: What's Not Eaten

The terms also have multiple meanings in taxonomic contexts in all areas, illustrating features of inclusive and specific usage similar to those for the Cedar City area. However, there is a tendency for informants from different areas to focus attention on only certain of these multiple meanings in every-day speech. Thus, [maʔábɨ] and [paʔábi] in common usage have come to denote slightly different groupings of plants and animals in the various Southern Paiute areas. Cultural and ecological factors may be operative in establishing these various regional meanings. They seem most apparent with reference to the category plants [maʔábɨ].

a. Plants /maʔábɨ/. Edward Sapir recorded the term [maʔabɨ] in his Southern Paiute dictionary (Sapir 1931:562), defining it as "plant, brush" but also including "flowers." His examples of the use of the term by his Kaibab informant provide illustrations of both inclusive and specific usages. Examples are: [maá(.)-XanI] "brush house," [maá(.)-xaiØA] "brush-mountain," [maá-tcix.a] "brush duck," [ma(.)á-c.^{i}'ip.I] "flower blossom" (female name), [maá(.)-c.iutcampiØi] "locust tree" etc. However, Kaibab and Chemehuevi informants recently questioned about meanings for the term [maʔábɨ] in taxonomic contexts, used it in the most inclusive sense to refer only to "wild plants" or, as one informant defined it, to "things that grow by themselves." To it they opposed [ʔɨápɨ] things you plant, or "your plantings" such as corn, beans, squash, amaranth, etc. Informants from the Cedar City area applied [maʔábɨ] to both cultivated and "wild" plants, thus giving it an inclusive meaning similar to the English usage.

In formal discussions, some people from this area qualified the term with designations such as /momúni maʔábɨ/ "Mormon plants" or [madɨ́kaci maʔábɨ] "White man's (American) plants" for cultivated species, opposing these to [nɨŋʷɨ́ maʔábɨ] "Indian's plants" or "native plants." But in no case did they hesitate to apply /maʔábɨ/ to both types of plants. It is possible that the use of the term in this way by Cedar City people may represent a recent extension of the original meaning to supply a native equivalent for English "plant," including now-familiar garden plants. However, it is equally possible that the differences reflect variations in cultural practices involving plants. Both the Chemehuevi and Kaibab Southern Paiute, who define [maʔábɨ] specifically as "wild plants," practiced limited garden horticulture in the pre-contact period. The occurrence among these peoples of a separate category for "cultivated plants" [ʔɨápɨ] as opposed to "wild plants" appears to be in keeping with these cultural differences.

Additional area differences are also found with reference to the use of the term [maʔabɨ] as a class designate with a more specific meaning. In the Chemehuevi-Las Vegas area, the term [mahábɨ] is applied to trees and large brush-trees, such as broad-and narrow-leafed cottonwoods, willow, mesquite, catclaw, mescrew and others, and is more frequently used in this context than in any other. One Chemehuevi informant stated that /mahábɨ/ in fact means specifically "tree" although in taxonomic contexts she applied the term more broadly (see Figure 19). For small herbaceous plants,

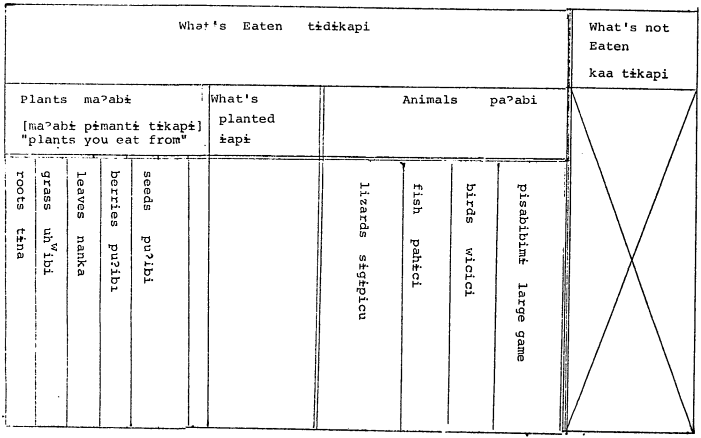

Figure 21: Kaibab Southern Paiute Categories:
What's Eaten

What's not Eaten kaa tɨkapi	Animals paʔabi	bugs paʔabi
		fish pahɨci
		birds wičici
		lizards sɨgɨpici
		snakes togoʔabi
		frogs pak^{w}antʔni
	Plants maʔabɨ	weeds maʔahantɨ
		maʔabɨ wɨnɨdɨ trees
		maʔasɨʔipɨ flowers
		musutuk^{w}ibi medicine
		uh^{w}ibi grass
What's Eaten tɨdɨkapi		

Figure 22: Kaibab Southern Paiute Categories: What's not Eaten

the Chemehuevi use a separate term [tɨsɨ́]. In his unpublished vocabulary of Chemehuevi, J. P. Harrington (Hill 1969) also records several forms with the stem /mahá-/, including [mahávə̣], glossed in Spanish as "monte" (forest?), [mahá] "grass" and the compound [mahágadədə] "forest." The etymology of the latter term is undoubtedly /maha-/ plus /katɨ-tɨ/, or literally "brush (perhaps in this case "tree") sitting." Harrington also records /təsəuə/ as "young and juicy plant growth."

In the Cedar City area as already noted, [maʔábɨ] does not commonly include "trees," except in the rarely used and all inclusive taxonomic sense. For ponderosa pine, cottonwoods and other "tall plants," these people prefer to use descriptive terms in discussions, such as [paʔántɨ wɨnɨ́dɨ] "high ones standing." In the field, when gathering specimens and plant names, they often referred to trees by location of habitat, such as [paawɨ́hamɨ wɨnɨ́dɨ] "(the one) by the water standing." A Kaibab informant referred to "trees" as [maʔabɨ wɨnɨdɨ], also a qualification of the term, and was hesitant to accept [maʔábɨ] not so qualified as including trees. The cognate with Harrington's Chemehuevi term "trees sitting," was recorded as a Cedar City place name for a specific ridge covered with scrub oak brush and not tall trees, i.e. [maʔákadɨdɨ] is "brush sitting."

The specific focus of meaning for [maʔábɨ] in the Kaibab and Cedar City areas, as opposed to the Chemehuevi area seems to be on the "plant, brush" or lower end of the taxonomic continuum of usage, while the Chemehuevi usage is on the <u>upper</u> end, or "brush, tree." The Kaibab and Cedar City groups apparently do not use the separate term for herbaceous species [tɨsɨ́], as it was not recorded in this study, nor does Sapir (1931) list it.

The difference in focus for the definitions between these two regions may be more apparent than real; however, it may also be the result of recognized environmental differences between the areas. In the Chemehuevi-Las Vegas environment, there are few trees that reach the heights of ponderosa, aspen, etc., except perhaps for a few cottonwoods growing near permanent water sources. Mesquite, mescrew, catclaw and narrow- and broad-leafed cottonwoods are often low-growing and produce few visible contrasts in the landscape. However, in the Cedar City and Kaibab areas, there are several visibly tall "trees." These may serve as a separate focus of attention for speakers from these areas, a focus somewhat distinct from "herbs and brush." Since the definitions for [maˀábɨ] overlap semantically at the position "brush," it seems valid to postulate that the original referent of the term may have been "brush" if not a specific type of brush, and that both groups have extended the meaning to fit their particular environmental circumstances.

In addition to these variations in usage for the term [maˀábɨ] specifically, these other Southern Paiute systems also illustrate features of category elaboration within this grouping. This phenomena is quite visibly tied to environmental contingencies, and may illustrate how terms expressing higher level relationships developed in these systems. With few "berries" present in the Chemehuevi area, informants were uncertain as to where to place them and what cover term to use, i.e. were they seeds [puʔíaka], or were they fruit [konápi], like apples? No one supplied a lexeme said to mean specifically "berry." However, Chemehuevi informants stated that mushroom [hitádɨ] was a general term for several named varieties, including "cottonwood mushroom" [sagáhita], "willow mushroom" [kanáhita], etc. The Cedar City people use cognate [ʔitádɨ] for "any kind" of mushroom (including toadstools, fungus, etc.), and do not label more specific types. On the other hand, they use a distinct term for berries and divide them into several named types. They also recognize valid botanical distinctions in pinyons, junipers, sages and several other plant groupings common to upland zones (see below).

Another instance of elaborated usage is seen with reference to the treatment of "thorny" plants in these two areas. The Chemehuevi recognize and label a botanically valid class of "sticker" plants [manabɨ] (from [mana-], "thorn") in their environment, including several named varieties of cacti, as well as yuccas (see Figure 19). In the Cedar City area, the class lexeme [manábɨ] is used as a specific designate for small inedible prickly pear, seen occasionally in the area (Opuntia sp.). They name only one other cactus [nabúbimpɨ] (Echinocerus sp.), also a small barrel that is rare in occurrence. The basic Uto-Aztecan cognate of this term *napu is used elsewhere for large edible prickly pears. The Cedar City application of the term for

Echinocerus sp. seems to further emphasize the insignificance of cacti in this area (see Chapter V).

The Cedar City people sometimes group together the two cacti and one yucca (found only in the very southern part of their territory) together with rosebushes, tumbleweeds and anything else with "stickers" as [manáma?abɨ], a class with little botanical validity. Although the terms from the two areas are morphemically related (/mana-/ plus nom. suffix /-bɨ/ and /mana-/ plus /ma?abɨ/ plant), the former seems to evidence the greater development toward a stem or root lexeme.

One other Southern Paiute classification of plants elicited during the course of this study is also worth noting as it illustrates further system flexibility. This is a scheme, based solely on a paradigm of habitat associations, taken from one Kaibab informant. After making divisions for eaten/not eaten, she proceeded to divide the edible "wild plants," glossed "plants you eat from" [ma?ábɨ pɨmántɨ tɨkápɨ] into the following categories: grows on the ground [tɨdábai nana.dɨ], grows at the base of a hill [piŋwá?abai nana.dɨ], grows on the mountain side [káiba páiyamaiXu naná.dɨ], grows on the mountain [káibama naná.dɨ], grows by the creek [?o?í-paa naná.dɨ], grows by the water [páikɨŋwabai nanádɨ] and grows anywhere [pahábia naná.dɨ]. Note here the use of the term "grow" in this context as cognate to Northern Paiute [naadɨ] "grower" or plant. None of the groupings made on the basis of habitat had further subdivisions (see Figure 23).

What God put on this Earth tɨwiipɨ madokunapɨhantɨ							
Good Eating ~ Food tɨtɨkapi "food" ~ tɨkapidɨ ʔudododɨ "what's good eating"							
tɨdabai nanaadɨ	pin^{w}aʔabai nanaadɨ	kaibɨ piya-maiXu nanaadɨ	kaibama nanaadɨ	piakɨn^{w}aabai nanaadɨ	ʔoʔipaa nanaadɨ	pahabai nanaadɨ	ɨapɨ
grows on the earth (ground)	grows at base of mountain	grows on mountain side	grows on mountain	grows by the water	grows by the creek	grows anywhere	what's planted

Figure 23: Kaibab Plant Categories: Paradigm of Habitats

Cedar City Southern Paiute		Chemehuevi					Kaibab Southern Paiute		
ma?abɨ	pa?abi	ma?abɨ	?ɨapɨ	pa?abi	wičici	pagɨ?ɨci	ma?abɨ	?ɨapɨ	pa?abi
plants	animals	wild plants	cultivated plants	four-legged animals	birds	fish	wild plants	cultivated plants	animals

Figure 24: Maximal Contrast Sets, Various Southern Paiute Areas

b. Animals [pa?ábi]. The term Southern Paiute use most commonly for "animals" [pa?ábi] also has some differing definitions in these various Southern Paiute dialect or sub-dialect areas. However, there seems to be less reason for postulating cultural or environmental causes for these discrepancies. Nevertheless, they evidence some interesting areal and personal differences in definitions.

Edward Sapir (1931:599) records the term [pa?ábi] in his Kaibab dictionary, defining it as "any living thing but man and plants." A Cedar City informant defined it as "anything on the ground, including birds too." Some informants feel, however, that [pa?ábi] contrasts with the classes birds and fish rather than includes them. Others feel that the specific focus of meaning for [pa?ábi] as "bugs" is a more appropriate definition. The use of the term as a cover designation by various informants is illustrated in Figure 24.

In the Chemehuevi area, [pa?abi] is commonly associated with "ground animals" and as such forms a contrast set with [wičíciu] "all things with wings" and [pagɨ́?ɨcu] "fish." In this most inclusive sense, [pa?ábi] here includes several subclasses: game animals [pisábivim], "bugs" or small creatures [pa?ávivim], snakes [kwiyáču], lizards [sɨgɨ́piču] and frogs [wagátaci]. Although the term [pa?ábi] has this inclusive meaning, it more often functions in relation to the category "bugs" or small creatures as in the category label [pa?ávivimɨ] (plural). The term the Chemehuevi most commonly use for other "animals" is the term for game animal [pisávivim]. It is defined as "eating animals" by informants. It includes all the larger "game" species, such as deer, mountain sheep, mountain goat, antelope, etc., as well as certain other "game" such as rabbits, squirrels, muskrat, etc. Although the association of [pisávivimɨ] is most commonly with game species, and specifically with those that are eaten, informants state that there is a certain sub-class of [pisavivimɨ] that are not commonly eaten, because they are "bloody." These animals include wolf, coyote, mountain lion, bobcat, etc., all basically carnivores. Although they are in a sense "game" animals, their food habits cause them to be classed as "bloody," and thus inedible. All the other [pisavivim] are basically herbivores.

In other Southern Paiute areas [paʔábi] and [pisávivimɨ] function in other ways. Sapir (1931:613) records [pi.siaθA] only as "animal" in his Kaibab dictionary, although the example he cites of its usage probably refers to a "game" animal. (In a mythological tale, coyote kills an unidentified [pi.síaθA] and places it in a pine tree for safe keeping.) Kaibab informants questioned as part of this study admitted knowing the term, but preferred to use [paʔábi] in the general context "animal," reserving [pisávivim] for a more specific usage as "large game animal" (deer, antelope, elk, etc.). They also stated that [paʔábi] includes birds and fish rather than contrasts with them. One informant stated that people were basically [paʔábi], and subclassified those into Indians [nɨŋʷɨ́], Mormons [momóni], white people [madɨ́caci] (Americans), Japanese [capánu], "Niggers" [tú.madɨ́caci] ("black Americans"), etc. For several informants, [paʔábi] also had a specific meaning "bug" in addition to its inclusive meaning as "animal."

There seems to be little order in these various differences that can be referred to as specific cultural or environmental contingencies, with the possible exception of the Chemehuevi usage of the subclass for tabooed carnivores. In the other cases, we seem to be dealing with dialectic and perhaps idiolect variation, complicated by the several levels of taxonomic meaning inherent to the term [paʔábi]. There are, however, also some cases of category elaboration within this grouping, in keeping with the environmental position of the territories of the various informants. These include: subvarieties of rabbits, squirrels, chipmunks for Cedar City people, and fish and turtles for Chemehuevi.

F. Summary and Discussion

The Northern Paiute, Shoshoni and Southern Paiute biotaxonomies presented above have a number of features in common. They also exhibit some differences. Similarities between schemes seem to result from the application of a common set of semantic principles to the question of the relationships among biological phenomena. Included among these are criteria of <u>use</u>, particularly use as <u>food</u>, recognition of some similarities in sets of <u>biomorphological</u> or <u>anatomical features</u>, distinctions as to means of <u>locomotion</u> (particularly for animals), common <u>habitat</u> preferences, <u>growth associations</u> or <u>community relationships</u>, and a number of minor criteria such as color, size, sex, texture, etc. These principles reoccur in all schemes but may be applied at different levels of specificity within any one scheme. Differences between schemes seem to result from this differential application of principles as well as from general environmental and cultural variations from Numic area to area.

The classifications have a character that is somewhat unique. They are not strictly biotaxonomic--at least in the Linnaean sense of hierarchies of mutually exclusive phyla, classes, orders, etc. Rather, because they incorporate various criteria at different levels of specificity, they tend to be only loosely taxonomic, evidencing in some cases interlocking sets of categories and recognitions. Some categories represent the actual intersection of the various semantic principles or components (see Goodenough 1956), others seem to mutually influence each other (see Bright and Bright 1965) and yet others retain a hierarchical--and often specifically Linnaean--orientation.

The most striking feature of the systems, aside from these overall characteristics, is the importance of the criterion of <u>use</u> in making distinctions. This feature acts in many senses as a unifying theme for all schemes, overriding recognitions based on biomorphology or other criteria. Specifically, people are concerned with <u>use as food</u> as opposed to other needs. The lexemes <u>what is eaten</u> and <u>what is not eaten</u> were elicited from all informants with a high degree of consistency. An idea of use beyond food, as for medicine, manufacture, etc., is also present but less well developed. It may operate covertly, especially in making distinctions among animal categories, inasmuch as goods are usually manufactured from the natural by-products of the hunt. The shape and meaning of the lexemes marking the used/not used categories in Northern Paiute seem to imply this type of distinction (Fowler and Leland 1967).

The categories plant and animal, although forming in some senses conceptual units as biological phenomena, are not consistently represented as such in the schemes. The terms applied to these designates vary from group to group. None are cognate, and none except perhaps the Southern Paiute terms approaches an unanalyzable stem linguistically. The Northern Paiute terms [ná́adɨ], literally "grower," and [yɨcɨ́ŋadɨ], literally "mover," can be applied to designates other than plants and animals. The Shoshoni terms [sɨ́aka] and [tɨ́ma sɨ́aŋgɨpɨ], the former also related to the stem "to grow--of plants" and [nɨmídɨdɨ] "movers" express similar distinctions. Only the Southern Paiute terms [maʔábɨ] and [paʔábi] are non-complex lexemes. Nor is their etymology immediately obvious. However, the variations in the usage of these terms by informants seem to suggest that these concepts do not as yet clearly mark categories applicable to the taxonomic distinctions plant *vs.* animal.

In many senses, the principle of use is probably best viewed as intersecting with the categories plant and animal at various points in the schemes. This intersection may take place somewhere below the level of conscious awareness for informants; i.e. in Chomksyan (Chomsky 1965; Chafe

1970) terms, somewhere in the "deep structure" of the semantic system.[14] The "surface" representation of the categories plant and animal as divided in the taxonomies may result from this intersection. The compounding of criteria of use with biomorphology may thus cause the categories to lose something of their overall conceptual unity, especially when treated in taxonomic terms. The use categories thus may not represent strict divisions of phenomena, but rather indicate the importance and priority of this criterion in discussions. The facility with which Southern Paiute speakers discuss "all plants" and "all animals" together, and occasionally apart from use, may result from the presence of more highly developed lexemes marking these categories.

In addition to the intersection of the use categories with those for plants and animals, regardless of their particular designates, there seems to be a second intersection of these two units with two major habitat categories, i.e. land vs. water. In most schemes, land plants and land animals are differentiated in some way from water plants and water animals. The principles of classification of sub-units within each of these categories may also vary, perhaps further reinforcing these distinctions.

Within the category edible land plants, most informants offer but one type of sub-classification, and this is based on the part of the plant used for food, e.g. whether

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[14]This does not necessarily imply a psychological view of deep structure. Chafe (1970) discusses deep structure and semantics from a more formal point of view.

it is the seeds, roots, berries, leaves, greens, etc. Inedible land plants are not divided in this way, but rather defined on the basis of mixed use/morphology criteria into weeds, flowers, grass, possibly trees, etc. Land animals follow a less strict edible-inedible distinction in all schemes, and exhibit similar subdivisions, including birds, with separate sub-groupings for large vs. small or high vs. low, or both; hoofed, horned or hunted game--a conceptual unit with various labels; clawed or furred animals, with at least cats, rabbits and mice recognized as subcategories; lizards; snakes and insects. The latter three are grouped together in Northern Paiute and Shoshoni as crawlers. The insects may be subdivided into bugs, worms, flies, butterflies, etc., all used as cover terms for a number of related forms.

Plants and animals recognized as distinct for their water habitats include a variety of individually named designates in all schemes, but with few other sub-categories. For plants, such terms as moss, algae, water-grasses (reeds), etc., are found in all classifications, and are used to cover many undifferentiated botanical forms. The water animals are divided primarily into fish and frogs in all schemes, but with individual schemes recognizing certain additional categories. All classifications also further reflect the importance of this particular habitat distinction in that they contain many individual plant and animal names with the modifier "water." Lexemes of the type "water X" also form a highly productive class in biotaxonomic nomenclature in all of Numic.

Environmental differences in aboriginal and current habitats influence some intermediate and specific categories. Note, for example, the Chemehuevi designation of a separate category for thorny plants, in keeping with their environmental position in the "hot desert" regions. The Owyhee Shoshoni also recognize and label several sub-types of currants as well as of other berries found in abundance in their local habitat. Cedar City Southern Paiute recognize as distinct two botanical species of pinyon or nut pines whose distributional range overlaps in their territory: [tɨbápi], the single-needled pinyon (*Pinus monophylla*) and [pádɨbapi], the double-needled pinyon (*P. edulis*). Other examples can also be cited (see various figures). Cultural practices and preferences also influence categories, as seen in the Northern Paiute segregation of a category fleshy plants, Chemehuevi mushrooms and Chemehuevi and Kaibab Southern Paiute cultivated plants. The Southern Paiute mythological references indicate some influences from this realm as well.

Although all schemes are marked by various upper level categories, many of which are shared in substantially the same form across the region, it should be stressed that the most important and active level of recognition for all groups is still the most specific; i.e., the level that names individual plants and animals. Informants in all areas are far more concerned with discussing forms here than with positing higher level relationships. Middle range categories are also the most difficult to elicit, even in highly structured situations such as suggested by formal frame analysis see above). This level corresponds roughly to the biologist's level of genus, and is one that has received considerable attention in ethnobiology in recent years (Berlin 1971; Bulmer 1968; Bulmer and Tyler 1968; Conklin 1962; Diamond 1966). We will return to a more complete discussion of it in Chapter V.

The focus on individual or generic names in the Numic biotaxonomies may have some environmental and behavioral correlates in the Great Basin region. As we have suggested elsewhere (Fowler and Leland 1967), there may be some connection between the development of upper level terminology and the existence of environmental and cultural situations that either stimulate or inhibit verbal organization of forms into higher levels of abstraction. Certainly, in all areas of the Great Basin, it is highly desirable to be able to recognize by sight and to name a considerable number of individual plant and animal forms. The varied ecological situation and the adaptation of subsistence patterns to seasonality and specific resources may have fostered a scheme that concentrates attention on a highly specific level rather than on general terms. Certain other cultural features surrounding the transmission of information on plants and animals may also be an influence here (see Fowler and Leland 1967:399-400).

IV. OTHER TAXONOMIC COMPARISONS

Having noted at least in a preliminary way some of the possible influences of environmental and cultural features on the development of the Numic biotaxonomic schemes, we will now proceed to a consideration of the importance of historical factors on their growth. Our best indications of historical influences would seem to come from a more detailed study of evidences for semantic and linguistic change, necessarily as reflected in the forms that comprise the Numic biotaxonomic lexicon. Before we can begin the task of lexical comparison and reconstruction, however, we need to consider some additional data on both Numic and non-Numic Uto-Aztecan systems. Additional Numic data are required to further validate the individual schemes as presented, while certain non-Numic Uto-Aztecan comparisons will give a necessary time depth to our linguistic inquiries. As noted by many comparativists (see for example, Swadesh 1959:11-12), questions involving the history of specific linguistic forms must often be answered by examining data outside the immediate area of concern. This is particularly necessary in the Numic case, in that considerable inter- and intra-dialect and language exchange might be expected given the socio-cultural situation in the Great Basin (Chapter II). The non-Numic data are actually too scant for any full historical consideration, but they do provide some interesting clues to relationships.

Comparative data on Numic biotaxonomies are of particular interest in that the schemes as presented display sufficient flexibility and overall variation to lead us to question whether they constitute "systems" at all. In other words, given the various options noted, and the stress by all speakers on the most specific levels, we might legitimately ask whether these schemes represent structured sets of semantic relationships with validity for numbers of speakers, or whether they are artificial constructs, perhaps resulting from the types of eliciting procedures employed. Although we probably cannot fully answer this question without many more studies using different techniques, we can look at the problem more closely from the perspective of what other writers have said about Numic taxonomies. These data are scattered in a number of publications, including a few specific, but non-taxonomic studies of ethnobiology (Chamberlin 1905; Hoffman 1885; Mahar 1953; Powell 1880; Train, Hendricks and Archer 1941; Zigmond 1941; 1971), some general ethnographies (Kelly 1932; 1964; Lowie 1924; Steward 1933; 1938; Stewart 1941), some linguistic studies (Hill 1969; Lamb 1958a; 1957; Sapir 1931) and other sources (Hittman 1965; Hoebel 1934; Perry 1964). The authors of most of these works comment on the "generic" or in this case "generalized" status of certain terms in ethnobiological nomenclature. Most of these remarks support recognitions reported here, although a few take note of additional relationships.

A. Other Numic Classifications

1. Northern Paiute

Perhaps the most detailed treatment of Northern Paiute "generic" terms for plants and animals is that given by John Wesley Powell in his ethnographic field notes taken nearly 100 years ago (Powell 1880). Powell was the founder and for many years director of the Bureau of American Ethnology. He was also an early Great Basin ethnographer, having worked with Northern Paiute, Southern Paiute, Shoshoni and Ute informants in various places and at various times from 1868 to 1880. He spoke one Numic language, that is Ute, passably well, and he gathered extensive vocabularies in several of the others (Fowler and Fowler 1971). The data that follow are from his Northern Paiute field notes, dated Pyramid Lake, western Nevada, 1880. They are cited in full below as they are particularly pertinent to our discussion. (Editorial comments are appended in brackets.)

> Powell (1880:241f) states that in Northern Paiute:
>
> All edible animals, birds, and fish, insects, jumpers, etc., are called <u>Ka-hu-a-wai-it</u>. [From verb /ho.waʔi/~/hoawai-/ "to hunt"; see Table 1 above for this term as an alternative lexeme in Northern Paiute classification.]
>
> All non-edible animals are called <u>kai-na-wha-wait</u>, such as skunks (who are bad Doctors), gophers (good doctors), lizards, frogs, horned toads, snakes, worms, butterflies, flies, mosquitoes, etc. [Again, from the verb "to hunt" plus /kai/, negative.]
>
> <u>Nu-nim-nu-mit</u>: Buffalo, antelope, deer, elk, sheep, horse, cattle, goat. [Derivation unknown, but all are <u>hoofed animals</u> as per category above; see Shoshoni [nɨmidɨdɨ] "movers."]

Ho-pi-ma-po-yu: Tree climbers, wild cats, squirrels, bears, grizzly, porcupines, etc. [From /húupi/, now "stick" and /púuya/ "to climb" and probably /ma-/ "with the hands," or literally "stick-with-the-hands-climbers."]

Tu-hi-mit: Diggers in the earth as badgers, moles. [From /hiwi/ "to dig."]

Tu-wip-hi-mit: Rats, mice, ground squirrels, etc. [From /tuwipɨ/ "earth" plus /hiwi/ "to dig."]

Kwu-mit: Divers, beaver, muskrat, otter, mink. [From /kumiʔi/ "to dive."]

Pa-gwi: Fish, trout, sucker, etc. [Powell adds specific names of fish to this category. Term is as fish recorded above.]

Tu-wi-pu po-zi: Ground lice. Insects that crawl, bugs. Po-zi: louse. [Literally as he translates it: /tuwipɨ/ "earth" plus /puziʔa/ "louse."]

Mo-ib: Butterflies, flies, mosquitoes, etc. [From /moibi/ "fly." See Northern Paiute category "fly-like things," /muíbik^{w}aʔniʔyu/, above.]

Nu-yu-wad: Snakes and worms; crawlers. [See above category /nuyúadɨ/ "crawlers."]

Mu-ju: Jumpers, crickets, grasshoppers and other insects. [Perhaps from /nizu/, cricket; see Shoshoni /mizoʔo/, cricket.]

Ka-sa-gai-yu: Birds. [From [kasa] "feather, wing," plus /-k/ga/ "to have, there is" and /-ʔyu/ "subjective," or literally "those with feathers or wings" or "those that have feathers or wings," see Shoshoni /kasa-kantɨ/, above.]

Kwa-nid: Wading birds. [Derivation unknown.]

Kwit-na
Nu mu kwit-na: } Eagles, buzzards, hawks, owls, etc. [From term for "eagle" /k^{w}iʔnaʔa/, but also given as a category marker for big birds in Shoshoni and Southern Paiute (see above). Train, Hendricks and Archer (1941) also record quie-nat-zee "little bird" /-ci/, diminutive. Reference to /nɨmɨ/ "person" probably indicates close association of these birds with human beings. They are considered to be omen bearers, etc.]

Pu hu kwu-min: Diving and swimming birds; wild geese, swan, ducks, brants. [Literally /pɨhɨ/ "duck" plus /kumiʔi/ "to dive."]

Pa-ko-rab: Meadow lark, jays, humming bird, wrens, black birds. [Term now used only for black bird /pakodobɨ/. May once have had a broader meaning.]

Hi-yo-ba:
Pa-ni-ri-yo-ba: Quail, pigeon, pine hens, etc. [From /ʔi.hobi/ "dove." Note that this category groups together "low fliers."]

Hu-zi-a: Little singing birds. [From /huziba/ "bird" but generally associated with small birds.]

Ho-pi: All plants, trees, shrubs, weeds, grass. [Probably from /huupi/, "stick," but perhaps also "woody plants" (Chapter V.]

Ho-pi kai-va: Trees, pine. [Literally "mountain sticks."]

wa-hab: Grass. [See /wahabɨ/ "grass" above.]

Tsa-ab to ni gan: Flowering plants. To-ni-gan: Flower. [Literally /caʔabɨ/ "trash" plus /toni-gaʔa/ "flower." See cover designation for plants not used above; /caʔabɨ/ "trash."]

Powell's classification shows many specific terminological correspondences with the Northern Paiute system presented in Chapter III; in categories hunted/not hunted (cited as alternatives, above, and also implying edibility), crawlers, fish, birds, ducks, trash, grass, flowers, etc. The scheme also shows some category correlations, although the terms elicited as labels differ; e.g. large hoofed animals, birds (those with wings as opposed to things that fly), the large/small distinction for birds, ducks, etc. Powell also lists some additional categories not recorded in the present study; e.g. wading birds, diggers, jumpers, etc. In another section of his work, he also lists "bats" as birds. It is interesting to note that his scheme, gathered nearly 100 years ago, shows correspondence in so many areas.

Other Northern Paiute ethnographers and linguists have also noted a few taxonomic groupings they term "generic." Perry (1964) states that the Fallon, Nevada, Northern Paiute use the term [huʒípɨ] for "any small bird" and the term [paawaj'tjɨhuusi'pa] for "any water bird" (term is literally "in-the-water-birds"). He also notes the use of [sɨŋápi] "cottonwood" for trees and [nád puhíka?yu] for grass or greens (literally "growth that is green"). Hittman (1965) notes that at Yerrington, Nevada, Northern Paiutes differentiate by name several types of ducks [pɨhɨ́], but that they do not consider ducks to be birds. He also records the form [wɨsíge?yu] as a term for animals, "usually with edible meat" (probably [wasɨ́ge?yu]; see Shoshoni).

Hoffman (1885:7) offers some interesting comments on Pah-Uta (Northern) conceptualizations of birds. He states that there is a division of birds into large and small, but that he did not find a contrast according to land vs. water. He notes that little birds are called nu-tsi-pa' (probably [huziba]), and that this category is expanded to include grouse, wild turkey and other like forms (perhaps "low fliers"?). He does not supply a term for the large birds. He adds that division according to size holds for all birds except the raptors (falcons, hawks, eagles, etc.). These, he says, are kept distinct and are individually named. He also notes that the terms for eagle, duck, blackbird and dove are basically "generic."

Mahar (1953) provides some material on plant categories for the Warm Springs, Oregon, Northern Paiute. He states that although he found no evidence for a complete native scheme of plant classification, he did note that there were certain "generic" groupings of these materials, usually based on appearance, habitat and use. Among these was a category including several conifers (pines, firs, hemlocks) and yew, all labeled [kataabi]. The term is applied more specifically to Douglas fir. Other groupings noted were: [súubi], willows (Salix spp.), but also applied to deciduous trees or shrubs that grow near water; [sigúpi] or [tabí sigúpi], including various plants from open, dry, desert areas, such as species of buckwheat (Eriogonum spp.) and rabbitbrush (Chrysothamnus spp.), and [wahábə], used for grasses of various types (see all in Northern Paiute schemes, above). He also records terms for various plant parts, such as "seed or fruit pit" [aka; ɔhɔ], "berry" [puwí], ʙúa], "blossom" [tonizat], etc., and lists the term [wunúdi] as an equivalent for "tree" (see Southern Paiute, Chapter III, and Chapter V).

The only other taxonomic data are those recorded by Lamb (1958a; 1957) for Mono, the other western Numic language. Lamb (1957) states in his dictionary of Northfork Mono that the terms for fish /pahk^{w}i/, bird /ciihpaʔ/ and snake /toqohq^{w}a/ (more specifically "rattlesnake"), as well as flower /hɨpikaʔ/ and tree /wɨnɨhpɨna/ are all generics.

2. Southern Paiute

There are few additional sources of data for Southern Paiute classifications. Sapir (1910; 1931) lists as "generic" the terms for "flower, brush" [maá-vi-maa(.) -øi], animal [pa'á -øI] and [pi.s.íaøA], fish [pa(.)í], bird [witsí'-ts.] [witisí'-øI], poisonous vs. non-poisonous snake [tɔɣa-øI] [tɔXɔ-øI] (rattlesnake) and [ɔɣɔ́-mpits.] (bull snake), flower [cɨ'Ï-p.i-] etc. Harrington (Hill 1969) records as generic for Chemehuevi "all the plants of the earth" [təvíəa maha'], "all the people and animals that live on the earth" [təvípəa pa'a'], "game animal--deer, cow, sheep, mountain sheep, etc." [pisáva'avi] "small bird [witsí'itsi], rattlesnake [kwi^{j}átsi], spider [hokóso'^{w}avi], worm [pa'ávi], fish [pagə́tsi] flower [sa'ipi]~[sə'iwa], grass [mahá'], etc. He also adds /təsə́və/, glossed "young and juicy plant growth" (see Southern Paiute, Chapter III), [mimíjarə] "any kind of vine," [təvitsipisə] "volunteer plant" (etymology, according to Harrington, "to come out of the earth"), and bud [wivún-kara'].

Data on Ute classifications are equally scant. Goss (1961) records the term [uʔeʔya], for Ingacio Ute, defining it as "plant, stalk, trunk." It is probably derived from /ɨʔa-/ the verb "to plant." He also records [wicic] for "bird." Chamberlin's (1909) Northern Ute informant equated ma-av ma-ap with sagebrush (Artemesia tridentata). Collins (1876:470) records mah-ab as "tree" in his "Ute" list. Harrington (1911:212) records the term for flower in Southern Ute as [sawaƌyty], and also lists terms for bird, butterfly, fish, etc.

Goss (1967) has also presented some interesting data on Southern Ute animal-kinship-mythology paradigms. In going through his vocabulary files, he noted that certain Ute animal names tended to fall together alphabetically with the terms for various relatives. Upon further investigating the situation ethnographically, he found additional name correspondences for several kin positions and was able to relate these further to the kin based activities of the myth prototypes of these particular animal forms. Although these correspondences in Ute do not constitute a classification scheme in the biotaxonomic sense, they nevertheless serve as one means of noting animal relationships--in a kin-based mythology. These correspondences are not as clear in Southern Paiute (Fowler 1967). However, the discussion of kin relationships for animals and the inclusion of mythological animal figures in Southern Paiute taxonomies may derive in part from this view (see Chapter III).

Zigmond's (1941; 1971) studies of the ethnobotany of the Kawaiisu, speakers of the other Southern Numic language, did not produce any biotaxonomic classification for plants, although he did note some special features of plant nomenclature (see especially Zigmond 1971). He also gives a definition for /maháve/ as "weed-like wild plants usually regarded as useless." Klein (n.d.), in unpublished linguistic notes for Kawaiisu, defines /mɨhábɨ/ as "brush."

3. Shoshoni

As with Northern Paiute and Southern Paiute, additional data on Shoshoni ethnobiology and classifications are scant and scattered in several publications (Chamberlin 1905; Conange 1951; Carlson and Jones 1939; Good 1964); Hoebel 1934; Shimkin 1947; Steward 1938; Train, Hendricks and Archer 1941). Most of these sources give information on the use of plants and animals, but little data on native views of their relationships. Only Chamberlin (1905) offers any systematic information on classification, and it is not complete. However, since several of his comments relate directly to the categories described here, they are worth reviewing.

Chamberlin (1905:359) makes the following observations on the names for plants as used by the Gosiute Indians of Utah:

> The Gosiute plant names, like our own popular ones with which they are properly to be compared, are frequently generic rather than specific in compass, or, naturally, they may apply to species lying in technically different though usually closely allied genera. . . . It often happens that a single kind of plant is known under two or more names to the Gosiute. In such cases one name is commonly more general in scope and applicable to various other related or supposedly related forms, while the other may be strictly applicable only to the particular form under consideration. Then, again, the plant may be regarded from different points of view, classed on correspondingly different bases, and so come to be designated under several class or generic names indicating these several relations. Thus, it may be regarded as to its habitat, as to its structure or appearance, as to its service to man or animal for food, or as to its use for medicinal purposes, etc. It may bear a different name indicative of each of these relations in addition to that which may be regarded as in a measure specific and restricted to it alone. The restriction in a name depended much on the importance or commonness of the plant,

> there being different names even for closely related species in many cases--proportionately much more numerous than is the rule among our own people.

Chamberlin's observations tend to support ideas as to the importance of such criteria as use, habitat and appearance in making distinctions among botanical forms. He also notes, however, that these dimensions, variously applied, may result in multiple names for designates in Gosiute. He also correctly identifies the generic quality of many plant names, and points out further that Gosiute perceptions about individual genera and species will not always be isomorphic with those of English speakers. He sees frequency of occurrence in the environment and economic importance to the people as important factors leading to specificity in plant naming.

In addition to these comments on plant nomenclature, Chamberlin also refers to some specific categories of plants recognized by the Gosiute. He describes, for example, features of a major category "medicine" na-tsu (see also Owyhee Shoshoni, Chapter III), with sub-categories defined for the types of diseases treated. Divisions, according to Chamberlin (1905:348), involve plants for wounds and cuts, i-a-na-tsu; bruises and swellings, bai-gwi-na-tsu; burns, wai-a-na-tsu; coughs and colds, o-ni-na-tsu; bowel troubles, koi-na-tsu; "worms," wu-i-na-tsu; venereal diseases, tim-bai-na-tsu; rheumatism, tso-ni-na-tsu; blood troubles, bui-na-tsu; bladder and kidney troubles, si-na-tsu; etc. He also gives several habitat groupings along with their category labels. These include (Chamberlin 1905:358): "pa-bu-ip, applied to any plant floating upon water, or growing in water with leaves above the surface . . . tim-bo-ip, applied to a shrub growing on mountain or in a canon . . . pan-di-sip, applied to a plant growing submerged in water."

Chamberlin also records a few other generalized plant terms, but does not discuss their use in any detail. Among these are three forms equated with plant: si-a-ka, pui-si-a-ka and o-pi wu-pi. The first has closely allied forms in "sprout, branch" recorded as si-u-gun, si-a-ka and in "bud" given as i-gi-si-a-ka. It is also one of the forms recorded for Owyhee Shoshoni (see Chapter III). Pui-si-a-ka is given as a "general name for green or growing plants." O-pi or wu-pi is applied more specifically to "wood," although Chamberlin (1905:384) states that it is "commonly used as the equivalent of tree or shrub, i.e., woody plant, or even of plant in general at times" (see Powell's ho-pi, "plant" for Northern Paiute, above). Additional generics include "flower," recorded as hi-bin-gup and grass so-nip. Chamberlin also refers to other clusterings of genera and species in various other sections of his work.

Train, Hendricks and Archer (1941) include a few terms referring to Shoshoni plant categories in their monograph on the medicinal uses of plants by Indians in Nevada. However, their transcription is of such poor quality that it is difficult to discover etymologies or even reelicit the material. (They record a number of terms for types of medicines, most of which are the same as Chamberlin's list.) They also include others with non-medicinal references, such as the following: "brush or shrub" see-bup-ee ([sibupi] from term for rabbitbrush Chrysothamnus nauseosus; see also Northern Paiute category); "flower" hu-bing-a [hɨbiŋg̯a], "just weeds" eshan-div-awip (possibly from [ižappɨʔɨ], coyote, and hence "false"); "ground plant" so-go-ron-zee-ah (from /sogo-/ ground plus ?); "dense or thick brush" tot-zip (?); "mountain brush" toya-abba-hobe ([tóyabi ɨ huupi], "mountain stick") (see Chamberlin and Powell above), "shrub or brush du-hu (also perhaps [huupi]); and "plant" wee-ub (?).

E. A. Hoebel also reports some data on plant and animal conceptions for the HekandIka, or Muddy Creek, Idaho, Shoshoni. These are contained in some unpublished notes he kindly loaned to the author (Hoebel 1934). Although Hoebel did not attempt a taxonomic study of HekandIka "foods," he notes that his informant for the food lists may have had some type of categorization in mind at the time she gave the information. Her data were given in the units fish, seeds, berries, roots, flesh and fowl. Also within the grouping designated as flesh (meat), she may have been implying some subcategories by her particular choice of ordering the foods. She discussed the forms in the following sequence: buffalo, deer, mountain sheep, antelope, ground hog, squirrel, a small squirrel, a large squirrel from pine country, flying squirrel, chattering squirrel, muskrat, beaver, otter, skunk, field mice, rat, wolf, wild cat, dog, horse, rabbit, cottontail, small grey rabbit, prairie dog and bear. Subcategories encompassing hoofed animals, squirrels and rabbits may be implied as well as others. The set from muskrat through wolf was given with the qualification that they were rarely eaten by her people. Wildcat, dog and horse were noted to be edible, but either "too hard to get" (wildcat) or "too valuable" to eat (horse, dog), thus perhaps forming another category. Hoebel (personal communication) states with reference to this list: "She thought of beaver, a water animal and this led to otter (not eaten) and then to the rest of this group, i.e. skunk, field mice, rat, wolf, wildcat, horse, dog. Iʃ --coyote--was not mentioned in the food list at all. It is totally tabu."

Although none of the above treatments, except perhaps Powell's Northern Paiute discussion, constitutes a complete biotaxonomic system for comparison with the data as elicited from Northern Paiute, Shoshoni and Southern Paiute informants, most of the relationships expressed by other authors are in line with these materials. Continued reference to the importance of use, habitat, appearance, and other criteria for making distinctions seems to indicate that most investigators have obtained similar materials in their studies. While these data do not fully substantiate or validate the systems of biotaxonomic classification as outlined here, they do lend strength to the position that systems of this general type are operative among these people. There is further indication of terminological depth, as well as some change, as we will attempt to better demonstrate in Chapter V. Before we proceed to that discussion, however, let us first consider what is known of the biotaxonomic systems of other non-Numic northern Uto-Aztecan groups as a further check on the reconstructions to follow.

B. Hopi Classifications

Data on Hopi plant and animal taxonomic classifications and terminology are reported in several sources, including most notably Voegelin and Voegelin (1957), Whiting (1939), Watson (1943), Mearns (1896), Bradfield (1968), Fisher (1896), Fewkes (1896) and Hough (1898; 1897). However, as with studies for other non-Numic Uto-Aztecan groups, none presents a complete or integrated Hopi system, and none approaches the problem of classification from the point of view of folk taxonomy or ethnoscience. All sources contain some definitions of "generics," and some notes on plant and animal relationships, but the parameters of class inclusion _vs_. exclusion for these are not always clear. Definitions sometimes appear to contradict each other as well, although as we have seen with the Numic groups, definitions for category labels may be subject to some variation with individuals, dialects, etc.

Despite the limitations of these works, especially in the area of taxonomic relationships recognized by the Hopi, all are valuable for comparative purposes. The findings of all investigators as reported reflect something of the environmental and cultural orientations of the sedentary, agricultural Hopi. Many interesting questions are raised by these materials, some of which can only be answered by more thorough studies of Hopi biotaxonomic systems.

Voegelin and Voegelin (1957), in their work Hopi Domains: A Lexical Approach to the Problem of Selection, present the fullest single account of Hopi plant and animal terms and relationships. These they treat in two sets, labeled "the domain of plants" (Voegelin and Voegelin 1957: 19-23) and "the domain of animals" (Voegelin and Voegelin 1957:16-19). Each "domain" contains a number of subsets of semantically related forms with their definitions, presented in dictionary form. The difficulty with this treatment, however, is that the reader is not certain whether the "domains" and subsets presented are native conceptual units, or artifacts of the Voegelins' organizational approach. In some cases, they add comments on native impressions (Voegelin and Voegelin 1957:16-17), but in others, we are uncertain of the Hopi view of these relationships. The eliciting procedure followed was designed to explore related sets of forms beginning with responses derived from texts and other conversations. However, the Voegelins (1957:2) also speak of a certain arbitrariness in placement that attends this type of eliciting. For purposes of our discussion, the Voegelins' categories will be presented here as if they were native concepts except where there is evidence to the contrary. This treatment should properly be regarded as tentative, however. Comments by Whiting (1939; personal communication 1969), Watson (1943), Bradfield (1968), Mearns (1896) and others will be added where they either help to clarify or where they contradict the Voegelins' findings.

1. Plants

Voegelin and Voegelin (1957:19-23) divide the "domain of plants" into thirteen groupings, largely as follows: 1) plant parts; 2) cultivation of crops; 3) beans and squash; 4) trees and bushes; 5) grasses and grains; 6) shrubs and other dense, low growing plants; 7) desert plants; 8) wildflowers; 9) tobacco; 10) corn plants; and 11) through 13), various cooked plant foods, mainly of corn. For purposes of this discussion, we will consider in detail only categories 4) through 8) and category 10). Figure 25 gives the approximate taxonomic relationships assumed by this treatment.

Voegelin and Voegelin (1957) record two forms as possible cover terms for the domain plants. These are: /ʔɨ:yi/, glossed as "plant" and /natwani/, glossed as "plants." Neither term is treated taxonomically in their report, either with regard to what it includes or excludes, or its position vis-a-vis the other. The first term, /ʔɨ:yi/ is apparently related to the stem "to plant" /ʔɨy-/ [Proto-Uto-Aztecan *ɨ$_s$(ca) (VVH) or *ʔe, *ʔei (UAC #323)],[15] and seems to refer to what we might define as "a single specimen of X plant." It first appears in the Voegelins' sub-set "cultivation of crops" where it is used in both free and compound forms. Examples of the latter are: "chile plant" /ʔciliʔɨyi/, "bean plant" /moriʔɨyi/, etc. It also appears in other sub-sets, as for example on the stem for Indian paintbrush plant

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[15]Henceforth, previous reconstructions by Voegelin, Voegelin and Hale (1962) and by Miller (1967) will be cited as VVH#__ and UAC#__, respectively.

Plants
natwani (?)

<table>
<tr><td colspan="7">coki ~ cocki
erect plant, bush or tree</td><td colspan="2">ʔɨ.yi
plant, cultivated</td></tr>
<tr><td colspan="3">himɨ-cki
tree, any kind</td><td colspan="4">tɨ:saka
grasses, herbs</td><td colspan="2">qa.ʔö   mori
maize   beans</td></tr>
<tr><td>hoqölö
woods,
forest</td><td>hon^{y}a
tall,
standing
plant</td><td>söhövi
tree</td><td>söhö
grass</td><td>ho:ki
grass</td><td>tɨ:sɨ
weeds</td><td>sihɨ
flowers</td><td></td><td></td></tr>
<tr><td rowspan="2">salavi
spruce,
fir
löqö
pondorosa
tɨvap-
pinyon
nömap-
cedar
ho-cki
juniper</td><td rowspan="2">hon^{y}a
oak
k^{w}invi
oak</td><td rowspan="2">söhövi
cotton-
wood
qaha:vi
willow
palacipɨ
birch
toho:vi(?)
aspen</td><td>söhö
<u>Hilaria
jamesii</u>
etc.
pashö
water
grass</td><td>ho:ki
<u>Stipa
comata</u>
etc.</td><td rowspan="2"></td><td rowspan="2">tɨkamsi
larkspur
mosisi
bean flower
he:si
mariposa
lily
mansi
Indian
paint brush
pawiya
buckwheat
ʔowasi
lichen</td><td rowspan="2">ko:minqaʔö
Walapai
corn
kocaqaʔö
white
corn
sikaqaʔö
yellow
corn
etc.</td><td rowspan="2">namok
pumkin
patnʔɨyi
squash
ci:li
chili
tɨmna
potatoes
si.wi
onions
melo:ni
melons
moŋ^{w}i
gourd
qawa.yvatna
watermellon</td></tr>
<tr><td colspan="2">le:hɨ
rice grass
k^{w}a:k^{w}i
dropseed
nö:nö
bunch grass</td></tr>
</table>

Figure 25: Hopi Plant Categories

/mansiʔɨyi/ (a wild flower) and "wheat, rice plant" /sohoʔɨ-yi/ (grasses and grains). Whiting (1939) also lists it on the stem for Russian thistle (introduced), /pahanʔɨ.yi/, literally "white man's plant." The status of /ʔɨ:yi/ as a term for this domain is possible, but not a certainty. Regardless of its meaning at this level, it also appears to form a contrast set at a lower level with the stem /coki (~cocki)/, "erect plant - as bush or tree" (see below).

The derivation of the term /natwani/, defined by the Voegelins (1957:20) as "plants" is not given, thus eliminating possible clues to its semantic components. Voegelin and Voegelin (1957:20) present the term in their first sub-set for the plants (plant parts), so that it appears by positioning to be a cover term for the entire domain. However, they also record it elsewhere under cultivated crops as one of the lexemes for "harvest." Thus, whether it refers to all plants, or merely to those that produce some harvestable product, is uncertain.

Watson (1943:50), in a short note on Hopi food categories, also records a term for "wild plants," nepni (neveni), treating it as a special sub-category of o:ŋala, "special foods" (see below). He does not elaborate on its definition, however, so that we are again uncertain as to whether it refers only to edible wild plants or to all wild forms. Whiting (personal communication, 1969) also equates this term with "spring greens," thus further confusing the issue, but suggesting a connotation of edibility. Whether the Voegelins' /natwani/ and Watson's nepni (neveni) are cognates or related forms should also be investigated.

In addition to these terms that may, or may not, refer to <u>plants</u> in the most inclusive sense, both Voegelin and Voegelin (1957) and Whiting (1939) record other terms that seem to denote certain intermediate level relationships. Whiting (1939:64), for example, gives the term [tu:saka] as referring to "grasses and many other herbs." Voegelin and Voegelin (1957:22) define their /tɨ:saqa/ as "wild grass, alfalfa" and give /tɨ.saq-coki/ (~-qölö) as "tuft of grass (plural)" and /tɨsaqavasa/ as "alfalfa field." The related form /tɨ:sɨ/ is probably the cognate of Chemehuevi /tɨsɨ/, "herbaceous plant" (see Chapter III), a definition in keeping with Whiting's for the related form [tu:saqa]. Other forms referring specifically to <u>grasses</u> <u>and</u> <u>grains</u> will be discussed under that category, below.

a. <u>Erect</u> <u>Plant</u> /cóki (~cocki)/. One of the major categories of forms treated by the Voegelins (1957:21) is that of /c̋óki (~cocki)/, defined as "erect plant - as bush or tree." This category as presented includes the names of several large, woody-stemmed plants, such as ponderosa pine /lóqö/, cottonwood /söhóvi/, willow /qahá:vi/, etc. (see Fig. 25). The related form /himɨ́-cki/ is said to refer to "any kind, uncertain kind of tree." In addition, the Voegelins report that the stem for juniper, /ho-/, plus the plural marker /-qölö/ also designates either "junipers (pl.), or "woods, forest"--presumably those containing junipers. An alternate term for this concept is /tépqölö/ (perhaps from the term for pinyon, /tɨvap-/ ?). The stem for oak tree

/hóŋʸa/, which also refers to "tall, standing plant," with the same marker yields /hóŋʸàqölö/ "grove of tall trees" (possibly of deciduous varieties?).

/coki (~cocki)/ also appears as a free stem or in compounds. It apparently can be added to individual tree and bush names to produce forms "X - tree/bush." Examples are: /kʷíŋvi-coki/ oak tree, /salávi-coki/ fir, spruce tree, /löqö-coki/ ponderosa pine tree, /tɨváp-coki/ pinyon tree, /söhöp-coki/ cottonwood tree, etc. Certain members of other categories reported by the Voegelins also form compounds with /coki (~cocki)/: i.e., /mohó-coki/ yucca plant, classified as a <u>desert plant</u> and /pivá-coki/ tobacco plant, placed in a separate sub-set labeled <u>tobacco</u>. The form /coki (~cocki)/ may thus function in some way as an implicit classifier, perhaps separating a category such as "perennial erect or woody-stemmed plants" from other forms. The stem /ɨ:yi/ at this level may mark a contrasting category. The list of compounds that the Voegelins record with the stem /ɨ:yi/ contains, for the most part, the names of annuals and small perennials; i.e., corn, beans, wheat, chile, rice, Indian paintbrush, etc.) The visual criteria of "erectness" is apparently not the only distinguishing feature for the use of /coki (~cocki)/ <u>vs</u>. /ɨ:yi/ in compounds, as tobacco plant, an erect annual, is recorded as /piva-coki/, while sweet corn plant and fresh corn plant, also erect annuals taller than tobacco, are recorded as /tawákci-ˀɨyi/ and /samí-ˀɨyi/, respectively. The use of the two stems, perhaps as implicit markers for some type of plant categories, should be further investigated.

From the data at hand, the categories they appear to mark are trees/bushes/woody-stemmed perennials *vs*. cultivated annuals/ small perennials. These are similar to some Numic conceptions we will discuss in Chapter V, as well as to some Papago distinctions noted by Mathiot (1962).

b. *Grasses and Grains*. Voegelin and Voegelin (1957: 22) also treat together several species of "grasses and grain plants," although there is no class designate given for the unit. The term /tɨ́:saqa/, already noted, is included with two meanings: "1. wild grass; 2. alfalfa," and /tɨ́saq-coki/ (~-qòlö) is given the definition "tuft of grass (plural)." Related /tɨ́:sɨ/ "weed" is also included here (see above). Both terms are probably more inclusive than this category *grasses and grains*.

Whiting (1939:64) also records the following "generics" for the grass family:

s3h3	grass, specifically *Hilaria jamesii*
pash3	grass growing near water (pah, water)
patusaka	grass growing near water
tupels3he	grass growing among rocks
mumuri	any grass-like plant with round stems and leaves growing near water [*Juncus*, *Scirpus*]

Whiting lists various species designated as [pash3], "water grass," including Colorado blue stem (*Agrophyron smithii* Rydb.), fringed brome (*Bromus ciliatus* L.) and mana grass (*Panicularia nervata* (Willd.) Kuntze). He also lists compounds with [s3h3], blue grama [harshu], "curly" for curling of mature spike, and [s3h3vos] wheat (introduced), literally "grass seed," so that the application of [s3h3] is clearly "generic" in some sense. Voegelin and Voegelin

(1957:22) list /sóhö/ as "1. planted grass; 2. alfalfa; 3. wheat, rice," all of which may be extensions of meaning in more recent times. The stem may be related to various other Uto-Aztecan forms as we shall see in Chapter V.

c. Shrubs and Other Dense, Low-Growing Plants. A fourth major category given by Voegelin and Voegelin (1957: 22) includes "shrubs and other dense, low growing plants." It is also unlabeled. It includes several types with seemingly different morphological characteristics; i.e., cane /pa:qavi/, Ephedra /ˀö́svi/, rabbit brush /sivá:pi/, tansy mustard /ˀá.sa/, wild currants /yówi/, jimson weed /cimóna/, etc. (see Figure 25). Whether this represents a native Hopi grouping, or some arbitrary unit is unknown, although from the length of the descriptive phrase used as a category label, one would suppose that the Voegelins are trying to find criteria to bring together some native unit.

In connection with possible groupings of shrubs and small bushes, there is one additional unit of particular interest reported by both Whiting (1939:96) and Bradfield 1968:64-5). This is the group designated [ma:ˀ3vi], which includes three species of Gutierrezia or snakeweed, three species of Chrysothamnus or rabbitbrush and Salidigo petradoria Blake, a low goldenrod. These are all low growing, compact shrubs that produce yellow flowers, and are often found in the same plant communities. The Hopi [ma:ˀ3vi] are sub-grouped as follows (Whiting 1939:96):

ma:ʔ3vi

ma:ʔ3vi	tcatcakma:ʔ3vi ("small, fine")	wuwukma:ʔ3vi ("large, coarse")
Gutierrezia lucida Greene	Gutierrezia sarothrae (Pursh.) Britt. Rusby G. Euthamiae Torr. & Gray Chrysothamnus depressus Nutt.	Chrysothamnus greenei C. stenophyllus Salidigo petradoria

The unit is of particular interest for two reasons: 1) it includes more species than are commonly grouped under a single plant name, and thus seems to have a more generalized meaning; and 2) it may be the cognate of Kawaiisu-Ute /maʔabɨ/ "plant, bush" cited above (Chapter III). We will return to a consideration of this relationship in Chapter V.

d. Desert Plants. The Voegelins' (1957:22) category "desert plants" includes various yuccas, cacti and the agave. It is a small grouping, unlabeled, and restricted in their consideration to five designates: narrow-leafed yucca /mó:ho/, broad-leafed yucca /samówa/, cholla cactus /ʔö́.so/, prickly pear cactus /ná:vɨ/ and agave /k^{w}á:ni/. Whiting (1939:85) adds two additional cacti: hedgehog [hó:ko] and another prickly pear [y3:ngu] (see Figure 25).

e. Wildflowers. This category is also unlabeled, although the Hopi stem for flower /sihɨ/ occurs as a member of several species names (see Figure 25).

Voegelin and Voegelin (1957) devote the remaining paragraphs of their treatment of plants to cultivated varieties, /ʔɨ:yi/. Beans /móri/, squash /pátŋaʔɨyi/, gourds /moŋwi/ and other domesticants are discussed separately from corn /qá.ʔö/ and the corn complex. Both Whiting (1939) and the Voegelins list numerous named varieties of beans and especially corn recognized by Hopi agriculturalists. They are classified by color, shape and hardness of kernel, and even by point of origin (see Figure 25).

2. Animals.

In addition to the plant domain with its various categories, Voegelin and Voegelin (1957:16-19) also treat separately a "domain of animals." It contains seven divisions, most of which are unmarked in the Voegelins' treatment. These are: 1) terms for body parts of animals; 2) large mammals; 3) small mammals; 4) birds; 5) snakes, frogs and lizards; 6) insects and worms; and 7) domesticated animals. Again, as with their plant categories, we are not always certain whether these are relationships perceived by the Hopi, or the results of organizational and presentational procedures. The taxonomic relationships implied, along with a sample of the designates included, are given in Figure 26. The Voegelins do not record a Hopi equivalent for the term "animal," and thus the entire domain is apparently without a cover term.

a. Large mammals. Voegelin and Voegelin (1957:16-17) state that the mammals listed in the categories large and small are also so classed by "some Hopi." Large mammals include the artiodactyls, such as antelope /cǒ:viwɨ/, deer /sowíʔŋʷa/, mountain sheep /páŋʷɨ/, etc., as well as bear /hó:nawɨ/, mountain lion /tóhow/, wild cat /tokóci/ and wolf /kʷéw/. The Voegelins do not indicate whether the Hopi sub-

Animals

( )

Mammals			Birds		Snakes/Frogs/Lizards		
Large	Small		Large k^{w}a:hɨ	Small ciro	Snakes lölöqan^{w}	Frogs pa.k^{w}a	Lizard kɨ.kɨci
cö:viwɨ antelope ca.yrɨ elk ca.yrɨra moose mosayɨrɨ buffalo sowiʔn^{w}a deer pan^{w}ɨ mountain sheep ho.hon-t bear tohow mountain lion tokoc-t wildcat k^{w}ew wolf	ʔi:sawɨ coyote ta.vo cottontail sowi jackrabbit qoliciyaw skunk mɨn^{y}awɨ porcupine honani badger le:tayo fox qöya-letayo gray fox sika:tayo brown fox laqana squirrel sakɨna gray squirrel	yovölö chipmunk mɨ.yi gopher tɨka prairie dog qa.la rat pösa mouse sawya bat	k^{w}a:hɨ Amer. eagle k^{w}a.yo eagle ki:sa predatory hawk kowa:ko-ma.ka chicken hawk natɨ:yawɨ hawk ki:le sparrow hawk mon^{w}ɨ owl tokori screech owl pi.k^{w}a night hawk yo.yvi.k^{w}a rain hawk wisoko buzzaru	co.ro bluebird ʔaʔa bluebird höwi dove sikaci canary-like tokocka black-bird ta.wamanaw oriole nɨrin^{y}aw woodpecker pa:wika duck ʔan^{w}ɨsi crow ʔasya sparrow	tɨwacɨʔa non-poisonous pa:lölöqan^{w}ɨ water snake sikalölöqan^{w} bull snake tok.kölöqan^{w} night snake cɨʔa poisonous snake rattlesnake cɨʔa	ra.na jumping frog pavatya tadpole maca.k^{w}a horned toad, frog not in water	kɨciʔpɨ lizard sp. mananya multi-colored lizaru

Figure 26: Hopi Animal Categories

Fish pa.kiw	turtle yönösona	Insects/worms				Domestic Animals -voko	
		a:nɨ ant	po:voli butterfly			fowl kowo:ko	
pa.kiw fish	yönösona turtle	sisiwʔanɨ small black ant tokoʔanɨ stining palaʔanɨ red ant	ho.kona large butterfly povolhoyo small butterfly	tööʔtölö grasshopper yaqancoro cricket momo bee hö.ya yellowjacket to:tovi fly totophoya gnat wɨpamcovɨ mosquito ko:kan^{w} spider hohoyaw stink bug piʔakɨ grub pesecʔola bedbug pɨcqomoqtaqa scorpion hocos-an^{w} centipede	ʔatɨ louse ʔa?hɨ worms, corn	etc.	po.ko dog etc.

Figure 26: Hopi Animal Categories (Cont.)

categorize the artiodactyls within large mammals, as do Numic speakers. However, shared morphemes link moose, elk and buffalo (see Figure 26). Wildcat and mountain lion show similar linkage.

b. Small Mammals. The small mammals include coyote /ʔí:sawɨ/, foxes /tayo/, jackrabbit /sóʔwi/, squirrels /laqá-na/, rat /qá.la/, bat /sáwya/, etc. Whiting (personal communication, 1969) notes that his informants considered bats to be birds, as do many Numic speakers. It is also interesting to note here the separation of two morphologically similar animals, wolf and coyote, into the categories large vs. small mammals (see above). They are considered "brothers" both because of physical features and ascribed activities by Numic groups (see Chapter III).

c. Birds. Voegelin and Voegelin also treat separately a category birds, labeled /círo/. The term /círo/ also means specifically snowbird. The Voegelins (1957:17) treat all birds within this unit regardless of size. However, Whiting (personal communication, 1969) tends to equate /círo/ with "little bird," thus, perhaps paralleling the Numic conception of "small bird" being used for "bird" in general. The Voegelins list various birds, by common name only, noting that ducks, both wild and domestic, form a special sub-category, and that shared morphemes link two eagles, two bluebirds and four hawks (see Figure 26).

Hopi ornithology is also discussed in an early but quite thorough study by Edgar A. Mearns (1896). Mearns was an army physician who apparently had intermittent contact with the Hopi over a period of years in the late 1800's. He also claims to have gathered extensive zoological vocabulary and identifications (Mearns 1896:392) of which his work on birds formed only a small part. The remaining zoological materials were apparently never published.

Mearns worked directly with informants, showing them either live or mounted bird specimens and asking for identifications. He states that while the "Mokis are not ornithologists, and cannot be expected to name even all birds that have fallen under their observation, much less such as have never attracted their critical attention," they are none-the-less well acquainted with birds, especially the raptorial species (Mearns 1896:393, 395). He notes further that they cannot be expected to "discriminate between closely related species that resemble one another in color or form," yet his listings show some species and variety distinctions. He also adds that descriptive names are quite common, and that some were generated by his informants for certain species on the spot. His list includes nearly 250 identifications, listed by scientific, common and "Moki" name. It should be referred to by any serious student of bird nomenclature. We will give here only a few of the sub-groupings indicated by the Hopi terminology or by Mearns' comments.

Mearns (1896:395) records three generic terms for <u>bird</u>, one for <u>bird</u> (<u>inclusive</u>) [qua-huh], one for <u>big bird</u> [quahuh] and one for <u>little bird</u> [che'e]. The first two are undoubtedly related to the stem for eagle /k^{w}a-/. We have already noted that a parallel usage is operative in Numic.

Mearns' [che'e] may be the same as the Voegelins' /ciro/, *bird* or *little bird*. If Mearns is correct, the Hopi use of the term for *big bird* for *bird* (*incl.*) is not the same as the common Numic practice of using the term for *little bird* in this context. However, we did note some variation in this practice, paralleling the Hopi situation.

Mearns (1896:396) also notes the wide extension of the term for duck in common usage, and comments that it denotes any member of the family *Anatidae* (swans, geese and ducks). He lists some 20 or more species included under the term [pah-wow-wow.itc-ta] (the Voegelins record /pa:wíka~pa:váwik-t/), covering teals, mallards, gladwells, terns, pintails, canvasbacks and others. Some of the names are compounds with various descriptive elements. Mearns also notes groupings for *hawks*, especially *Falco* spp., *eagles* and *owls*. He adds that the California cuckoo is classed by the Hopi with *pigeons*, that the term for kingfisher [che-humuah] is also applied to several other "water birds," that 3 genera of woodpeckers (actually woodpeckers, sapsuckers and flickers) are classed together and that the terms for black birds, Juncos, swallows, wrens, vireos, etc., are all "generic." His remarks should be compared with those of other writers on native view of birds in this region to see if the Hopi view has any unique features.

d. *Lizards, Frogs and Snakes*. Voegelin and Voegelin (1957:18) also group together snakes, frogs and lizards into a single unlabeled class. They add that within this unit, the term /lölö́qaŋʷ/ can be used for "snake - any kind, generic." Specific snakes such as water snake /pá:lölö-qaŋ^{w}ɨ/, a "night snake" /tok.lölöqan^{w}ɨ/ and bull snake /siká-lölöqaŋ^{w}/ are compounds of this term plus descriptive designations. They also record /cɨ́.ʔa/ as "rattlesnake, poisonous snake" and /tɨwácɨʔa/ as "non-poisonous" snake, each supposedly a cover term. Frog /pá.k^{w}a/, lizard /kɨ́.kɨci/ and fish /pá.kiw/ have similar functions.

e. Insects and Worms. The category insects and worms, also unlabeled, forms the next unit in the animal domain. Within this unit, most forms given designate orders of insects as do many of the Numic forms (Chapter III). These include: large butterfly /hó:hokon-t/, small butterfly /povólhoyo/, grasshopper /tö́.töl-t/, cricket /yaqáncoro/, bee /mómo/, yellowjacket /hó.ya/, fly /tótovi/, spider ("any kind of black spider") /kókaŋ^{w}/, ant /ʔa:nɨ/, corn worms /ʔá:hɨ/, etc. Several of these categories have individually named members as well (see Figure 26). More thorough investigation would probably reveal others as well.

f. Domestic Animals. Lastly, Voegelin and Voegelin (1957:19) present the class domestic animals, which is labeled by the form for "pet, dog" /poko/ with the first person possessive /i-/, to give /ʔi-voko/. The category includes horses, mules, sheep, goats, cats, eagles, fowl, etc. Many of the names for domestic animals are Spanish loans (see Figure 26).

3. Hopi Foods.

One additional note on Hopi classifications is of value to Numic-Hopic comparisons. This is contained in a brief article by Watson (1943), titled "How the Hopi Classify Their Foods." Watson (1943:49) states that "the Hopi universe, from the point of view of food is divided into nuh: sioka, "that which may be eaten," and ka-nuh:sioka, "that which may not be eaten." This type of distinction parallels semantically the Numic conception, with the theme of use pervading other concerns and intersecting with Hopi classifications into plant and animal, morphological categories.

Watson (1943) draws attention to this distinction to illustrate a sub-category that is also of interest. This is öönala, an elusive concept, that seems to refer to those edibles that are particularly "tasteful, scarce and to be used sparingly." This concept is contrasted with the class staple foods, which are for the Hopi almost entirely agricultural crops. öönala are of four classes: meat, garden vegetables, seasonings (salt, sugar, chili, etc.) and wild plants (nepni neveni). All of these foods are supplemental to the Hopi diet of corn, beans, etc. We have already noted that Whiting (personal communication 1969) translates nepni as "spring greens." öönala seems to illustrate the subordinate position of native food plants and game animals in Hopi conceptions. However, the category, and its relationship to other Hopi biotaxonomic units, should be more thoroughly investigated.

The Hopi categories outlined illustrate several features that are in keeping with the environmental position and cultural orientation of these people. These include: desert plants, desert shrubs, cultivated crops, elaborations for corn, beans, etc. More thorough taxonomic investigations would probably yield others. Comparisons with Numic plant categories indicate similar concepts in desert shrubs, forest, flowers and grass as well as the categories weeds and cultivated crops shared particularly with the Southern Paiute (see Figure 19). Comparisons with animal categories indicate common groupings for felines, large vs. small birds, snakes, lizards, fish, frogs and various insect groupings. Cognate lexemes mark several of these units as we shall see in Chapter V. Maximal groupings eaten vs. not eaten may also show parallels. Apart from the categories for birds, and perhaps for foods (eaten vs. not eaten), the system as we have it displays few unique features. We will further discuss most of the remaining categories when we treat the problem of biotaxonomic universals below (see Chapter V).

C. Tubatulabal

Comparative data for the biotaxonomies of the Tubatulabal are available only in E. W. Voegelin's (1938) general ethnography (see various sections on subsistence, ethnobotany and medical practices), and in C. Voegelin's (1958) working dictionary of Tubatulabal (data similar to the above, but in revised orthography). E. W. Voegelin outlines the skeleton of a plant taxonomy (see Figure 27), and adds some brief comments on the use of its various categories.

The plant classification Voegelin (1938) presents is oriented primarily toward food products, with the names for edible parts taken serving as class designates. There are

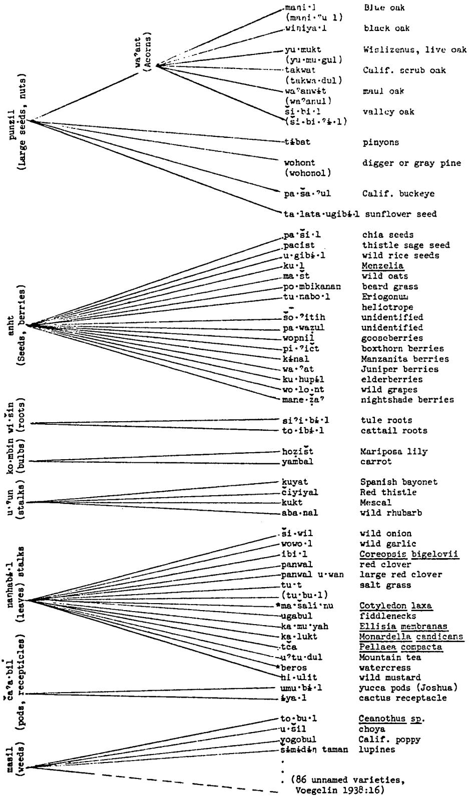

Figure 27: Tübatulabal Botanical Categories

six of these categories, plus an additional grouping for named and unnamed varieties of weeds /masil/ and another for flowers /ʔi.bil/. The categories are as follows (see Figure 27): 1. large seeds, nuts /punẓil/, including members such as pinyon nuts /tɨbat/, buckeyes /pa.sa.ʔul/, sunflower seeds /ta.lata.ugibɨ.l/, etc. This category also has a sub-class acorns /waʔant/, with the nuts of six species of oaks differentiated (see Figure 27). The label for the sub-class acorns is derived from the name for the maul oak /waʔanul/ (*Quercus chrysolepis*) and its acorns /waʔanwit/. This form is common to the foothill and mountain areas of Tubatulabal territory. 2. Seeds/berries /anht/. This category contains various members, individually named, such as chia /pa.si.l/, *Mentzelia* sp. /ku.l/, gooseberries /wopnil/, elderberries /ku.hupɨ/, wild grapes /wo.lo.nt/, etc. 3. Roots /wi.sin/. This grouping includes only tule /siʔi.bɨ.l/ and cattail roots /to.ibɨ.l/, according to Voegelin's (1938) data. 4. Bulbs /ko.mbin/. This category also has but two members, Mariposa lily /hoxist/ and wild carrot /yambal/. 5. Stalks /u.ʔun/. This grouping includes Spanish bayonet (a yucca) /kuyat/, mescal /kukt/, wild rhubarb /aba.nal/, etc. 6. Leaves /naŋhabɨ.l/. This is a category with numerous members, such as red clover /panwal/, slat grass /tu.t/, ephedra /uʔtu.dul/, etc. (see Figure 27). And lastly, 7. Pods, receptacles /caʔa.bil/, containing the two members Joshua tree (pods) /umu.bɨl/ and cactus receptacles /ɨya.l/.

The Tubatulabal category weeds /masil/, includes various named varieties of plants with no known use, such as cholla /u.sil/, California poppy /yogobul/, lupines /sɨmɨdɨn taman/, literally "rattlesnake's teeth," etc., as well as numerous unnamed varieties, including grasses. Of these, some can be further described as flowers /ʔigil/ (from /ʔiʔi-biʔ/ "to bloom"). Voegelin (1938) lists some 86 plants, identified by genus and species, that were viewed by her informants as weeds.

Apart from these categories, few other "generics" are listed by either author. C. Voegelin (1958) records the forms /ʔugan/ "the patch (of plants)" and /ya.mu.gi.wal/ "myth class of animals" in his dictionary, but provides no equivalents for the terms "plant" or "animal." E. W. Voegelin (1938) makes additional note that the form for cottonwood tree /u.ʔut/ can be used for "tree" (a Numic parallel). She adds that the form for fish /kuyu-l/ is basically "generic." It includes the following five forms: trout /haʔayal/, whitefish/bullheads /co.h/, suckers /nimal/, catfish /kana.-ganan/ and minnows /koʔosiʔ/ (Voegelin 1938:13). The form for ant /pa.nɨn-t/ also includes several named varieties. And other forms, such as that for lizard /sikol/, large and small frogs /wo.hna.l/ and /ẇa.ga.ist/ probably also designate multiple biological genera and species. Although E. W. Voegelin (1938:12) lists several named varieties of snakes, all of which are tabooed as food, she does not provide a class equivalent. The only designation for birds is recorded by C. Voegelin (1958) as /ʔuhula-t/, said to be the "male of any bird" (see below, Luiseño /ʔihen-ma-l/, bird).

Of these various categories listed, several have Numic parallels, including those for seeds, leaves, roots, berries, flowers, weeds, fish, lizard, etc. The feature cottonwood = tree is also noted. Although these data are incomplete, they will furnish some forms for comparisons in Chapter V.

D. Luiseño, Cupeño, Cahuilla and Serrano

Comparative data on biotaxonomies for the Luiseño, Cupeño, Cahuilla, Serrano and other small groups speaking languages of the Takic branch of Uto-Aztecan are so meager that we will treat them here as a unit, stressing linguistic instead of cultural parallels. What data there are for these groups are scattered in various ethnographic and linguistic publications. Among these are two ethnobotanical reports; the early classic monograph by David Prescott Barrows, The Ethno-botany of the Coahuilla Indians of Southern California, (Barrows 1900; 1967) and P. S. Sparkman's "Plants Used by the Luiseños," appended to his Luiseño ethnography (Sparkman 1908). Neither author presents a classification of plants for his respective group, although each notes a few cases where native terminology is either more or less inclusive than that of modern taxonomic botany [see for example, Sparkman's (1908:230) note that navut, prickly pear, is extended to several species of Opuntia and Barrows' (1900:62) discussion of the class oaks].

In addition to these two works, and perhaps of more value for taxonomic terminology beyond a listing of individually named forms, are several contributions to Takic linguistics. These include Bright's (1968) Luiseño dictionary, Kroeber and Grace's (1960) treatment of Sparkman's early Luiseño grammar, J. Hill's Cupeño grammar (1966), K. Hill's Serrano grammar (1967) and Miller's (n.d.) unpublished Serrano lexical file. The authors of each of these works record and define certain terms as "generic," or as having broader terminological implications. Those given by Bright (1968) and Kroeber and Grace (1960) for Luiseño are more numerous and provide a partial skeleton of a classificatory scheme. The terms are as follows: for plants, flower (from /ṣọ.ʔ-/, to bloom), grass /ṣa:mut/ (but also hay, weeds), edible greens /ne.qa-t/, tree/wood/stick /kula.wu-t/ and seed/eye /pušla/; for animals, lizards /qasi.pwot/, snakes /piqwa-la/, fishes /ʔana.ma-t/ (Kroeber and Grace 1960) and also /kuyu.-l/ (Bright 1968), birds /ʔihen-ma-l/, ducks /qa.tqa-t/ and ants /ʔa.na-t/. Although we are uncertain of the exact referents of these terms, each clearly represents some extension of a class concept.

Neither Kroeber and Grace (1960) nor Bright (1968) list equivalents for the terms "plant" and "animal," although each notes certain other forms with broader implications. There are, for example, two Luiseño stems that refer to plant-covered or forested areas: /yamì.-ca/, "forest, thick brush" (Bright 1968:53) and /toʔwi-s/ "forest, uninhabited area, where wild plants can be gathered" (Bright 1968:44). The latter apparently comes from the stem /toʔwi-/, "to gather, as seeds; to harvest" (Bright 1968:44). A related form /toʔwi-ya-m/ is said to designate "wild animals" (see also /ʔas-la, "pet, domestic animals).

In addition, Bright (1968) also lists the following verb stems used with plant and animal referents: /ʔa.mu-/ "to hunt small game," /cawʔa-/ "to be unproductive, of plants," /pu.na-/ "to grow, of plants," /paqa-/ "to sprout through the ground, of plants," /tu-/ "to bear fruit" and /wola-/ "to grow, of plants or animals." Kroeber and Grace (1960:7) also record /maxi/ to "gather greens," with related form /maxiš/ "greens for eating," (see Tubatulabal weeds /maṣil/ for possible cognate). They also add two terms for "boy" and "girl" <u>insect</u>, /hene-t-maxiš/ and /nawi-t-maxiš/ (a case of polysemes?).

In Cupeño, there are apparent cognates for the following forms: flower /pəṣəʔə/, grass /səmat/, wood (tree?) /kəlawət/, seed/eye /puc/ (also "fruit or fruiting bodies of flower, seed"), woods, chaparral /təʔwiʔə/, forest /yəmi/, fish /qəyu/ bird /hini/ ("young bird") and ant /ʔanət/. Hill (1966) also records the verb stems /tuʔ-/ "to bear fruit" and /təw/ "to grow, of plants" (see /toʔwi-/ above). In addition she lists the term /yupi/ "brush."

For Cahuilla, the forms /seʔil/ blossom, /samat/ grass [but also brush; possible Cupeño cognate /sama/ brush sp. (Hill 1966)], /putcil/ seed, /qelawat/ wood/tree and /kiyul/ fish are apparent cognates (Kroeber 1909). Kroeber (1909:238) also records [xanamo-im] ducks, apparently cognate with Mohave [hanemo], duck, and gives the form [wik'ikmal] as bird, although his [hen-hin-ik], "to fly" is the apparent related form for Luiseño and Cupeño bird.

The Serrano terms show some phonological[16] and lexical divergence (Miller n.d.; Hill 1967), but are also similar. They are: flower /-sɨ/, grass [haamət], seed [ʔapuc] ("its seed"), wood [kotcat], fish [kihutu] and ant [ʔanɨtɨ]. There is a possible cognate in forest [awa.c], but a second term for forest [ceita] appears to be unrelated. Also contained in Miller's lexical file are forms for "bushy" [canapɨkɨ] and duck [mahaqaʔa].

Several of the above taxonomic positions show definite relationships from language to language--either lexically or semantically. Especially strong are the categories grass, flower, seed, wood/tree, fish, ant and perhaps forest. Others, such as snake, lizard, bird, wild animal, etc., as represented in Luiseno, may also have semantic or lexical cognates in the other languages, but data are lacking to allow this generalization. Figure 28 gives what we have of a Luiseno taxonomy, with starred positions possibly indicating the remnants of a Takic ordering (see also, Chapter VI). Further work is needed to validate most of these positions.

[16] One correspondence seems to be between initial /h/ and medial /h^w/ and Cupan /s/. Hill (1967) discusses the sounds of Serrano, but does not provide an historical sketch of phonology.

- Animals
  - ʔtoʔwi-ya-m (*) "wild animals"
  - ʔihen-mal (*) "birds"
  - ʔäna.mat~kuyu.-l (*) "fishes"
  - qasipwo-t "lizards"
  - piqwa-la "snakes"
  - ʔa.nat (*) "ants"
- Plants
  - so.ʔ- (*) "flowers"
  - sa:mut (*) "grass"
  - ne.qa-t "edible greens"
  - kula.wut (*) "tree/wood/stick"

Figure 28: Luiseño Plant and Animal Categories

V. HISTORICAL DEVELOPMENT OF NUMIC BIOTAXONOMIES

The Numic biotaxonomies presented in Chapter III, and in the notes in Chapter IV, have several features in common. All schemes seem to derive from the differential application of a set of semantic criteria, including use, features of biomorphology, habitat, etc. These intersect at various points in the schemes to form the categories described. Most of these intersections are marked by one or more lexemes. A few are not so marked, and can be considered as unlabeled and perhaps covert (see Chapter III). In most cases, the lexemes marking categories are both semantic and linguistic cognates. In a few cases, however, they are non-cognates, either expressing dissimilar semantic concepts, or perhaps similar concepts by different lexemes.

In order to consider the possible origins of these schemes, and their importance for studies of Numic prehistory, we will now compare the systems for linguistic evidences of relationship. Through these comparisons, we hope to be able to separate those features of the systems that are the result of common historical origins, from those that are due to independent developments. To accomplish this end, we will compare the Numic systems internally, or with each other, as well as externally, or with the other northern Uto-Aztecan schemes as outlined in the previous chapter (Chapter IV).

The theoretical and methodological principles to be used in the attempted reconstruction, and in considering possible changes in the systems through time are based on the observations and suggestions of several authors, including Berlin (1969; 1972), Berlin, Breedlove and Raven 1966; 1968), Bartlett (1940), Bulmer (1968), Bulmer and Tyler (1968), Conklin (1962) and Friedrich (1970). Of particular interest is Berlin's (1969; 1972) recent proposal relative to possible universals in the development of biotaxonomic nomenclature. Since aspects of his scheme are central to our discussion, and since his paper is not generally available as yet,[17] we will review his materials briefly before proceeding.

A. Universals in Biotaxonomic Nomenclature

In a recent paper titled "Speculations on the Growth of Ethnobotanical Nomenclature," Brent Berlin (1969; 1972) makes several suggestions relative to the development of taxonomic systems. These stem from his own investigations of the ethnobotany of the Tzeltal and Tzotzil, Mayan speaking groups of southern Mexico (Berlin 1969; Berlin, Breedlove and Raven 1966; 1968), as well as from a careful examination of the general literature on folk botany, and, to a lesser extent, on folk zoology. Berlin argues, primarily on linguistic and semantic grounds, that certain growth patterns are perceptible in ethnobotanical nomenclature, and that these

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[17]Berlin's paper is to be published in the journal <u>Language in Society</u>. Permission to cite the prepublication version was kindly extended by the author.

may have some interesting historical implications. He notes that systems do not appear to develop randomly, but that each follows a definite, and often similar pattern. This pattern can best be described as one of vertical and horizontal expansion, from terminology that is more specific to that which is more generalized.

As a starting point for his discussions, Berlin (1972:2) suggests that the botanical (and probably also zoological) lexicons of many, if not all languages, can be described as referring to six major categories of "taxa."[18] These he labels as follows: 1) generic; 2) specific; 3) major life form; 4) varietal; 5) intermediate; and 6) unique beginner. The approximate taxonomic relationships of Berlin's classes, along with my illustrations from western American English folk biology,[19] are given in Figure 29, page 178.

Berlin (1972:3) further suggests that there is a general evolutionary sequence for the emergence of these classes and their attendant nomenclature in folk systems. He notes that:

> . . . in the life histories of individual languages, the encoding of each of these nomenclatural categories occurs in a relatively fixed order. <u>Generic</u> names are considered fundamental, and will appear first. These will be followed by major <u>life form</u>

[18]Taxa, following Berlin (1972) and Berlin, Breedlove and Raven (n.d.) are the descrite labeled forms in a taxonomy.

[19]Reno, Nevada. As these are "folk" categories, they do not necessarily correspond to the biosystematics of modern biologists.

Unique beginner	"plant"	"animal"
Major life form	"tree"	"bird"
Intermediate	"evergreen"	"water fowl"
Generic	"pine"	"duck"
Specific	"pinyon pine"	"teal"
Varietal	"single-needled pinyon" or "Nevada pinyon"	"blue-winged teal"

Figure 29. Universal Categories in Biotaxonomic Nomenclature

names and *specific* names. At yet a later period, *intermediate taxa* and *varietal* taxa will be labeled. Finally, the last category to be lexically designated in the development of an ethnobotanical lexicon will be the *unique beginner*.

Berlin (1972:3) diagrams the historical relationship of these classes as follows:

$$\text{generic} \rightarrow \left\{\begin{matrix}\text{life form}\\ \text{specific}\end{matrix}\right\} \rightarrow \left\{\begin{matrix}\text{intermediate}\\ \text{varietal}\end{matrix}\right\} \rightarrow \text{unique beginner}$$

And he makes two additional observations regarding the scheme: 1) that each category, with the exception of *unique beginner* is theoretically an open class; i.e., new data can be added at any time in its history; and 2) that no temporal priority is claimed for the categories *major life form* over *specific* or *intermediate* over *varietal*. He contends, however, that "a language must have encoded *at least* one major life form name and one specific name before the appearance of intermediate and varietal named taxa" (Berlin 1972:3).

Berlin's contention that generic names have conceptual and temporal priority follows from his own investigations as well as those of several other ethnographers (see specially Bartlett 1940; Bulmer 1968; 1970; Bulmer and Tyler 1968; Conklin 1962; Diamond 1966; Fowler and Leland 1967; Levi-Strauss 1966). Bartlett (1940), for example, concluded after his own extensive examination of the literature on non-western and pre-Linnaean folk systems, that a well defined concept of genus was present in all groups investigated. He defined it as " . . . the smallest group that most everyone might be expected to have a name for in his vocabulary" (Bartlett 1940:351). He further noted the tendency of peoples to ". . . group similar species under generic names, and to name the species by using some linguistic device not unlike the binomial nomenclature of Linneaeus" (Bartlett 1940:353-4). He further suggested that there may be a psychological basis for binomial nomenclature as a means of manipulating what might become an otherwise overparticularized or otherwise unwieldy terminology. He (1940:356) concludes:

> The important point is that it is quite as characteristic of folk botany as of modern systematic science to classify to the genus, which is more or less consciously thought of as the smallest grouping requiring a distinctive name. Within the genus, if the distinction of several kinds is necessary, a qualifying designation is used and the whole name becomes a binomial. If there is but one sort within a genus, no qualifying word is necessary, the generic name is sufficient.

The basic importance of a concept of genus is also noted by Bulmer (1968; 1970; Bulmer and Tyler 1968) with reference to his ethnozoological studies among the Karam of New Guinea. He generalizes his conclusions with the hypothesis that " . . . in any total classification of plants and animals there are important lower order categories which are seen as 'objective' by the users of the classification and which are the smallest <u>logically</u> natural units defined by multiple criteria . . ." (Bulmer 1970, as quoted by Berlin 1972:4). He notes further that these groupings most probably result from observations of " . . . objective regularities and discontinuities in nature" (Bulmer 1970, as quoted by Berlin 1972:5).

Using this recognition of the basic nature of generic names as a starting point, Berlin (1972) goes on to describe the development of nomenclature in several specific systems, including primarily those of the Tzeltal. He notes that several processes may be generally operative in their growth. <u>Analogy</u>, or <u>concrete transposition</u> is seen as a primary means for the horizontal expansion of systems at the generic level. New genera recognized by the classifiers are "likened" to those already known in some way. In Tzeltal, for example, likeness or relationship at this level is often expressed by adding an animal name to the generic form; e.g., /ˀisim/ corn (<u>Zea mays</u> L.) and /ˀisim ˀahaw/ "snake's corn" (<u>Anthurium</u> spp.), or /k'ewes/ custard apple (<u>Annona cherimola</u> Miller) and /k'ewes mas/ "monkey's custard apple" (<u>A. reticulata</u> L.) (Berlin 1972:9). <u>Differentiation</u> is seen as a primary process by which specific names are formed from generics. This is frequently accomplished by adding an attributive to the generic form to produce a binomial. Again, from Tzeltal, /ʔic/ chili pepper is generic, while /bac'il ʔic/ "genuine chili pepper," /cacaw ʔic/ "round chili pepper," /ton ʔic/ "stone chili pepper," etc., are specific (Berlin 1972:16). Combinations of differentiation and generalization are also seen as responsible for the development of terminology on most other levels.

Although Berlin (1972:20) notes that the processes by which major life form names and intermediate names are generated are not well documented as yet, he feels that he can tie some specific cases of their formation to generalization of generics. He notes that the terms elevated may be those labeling culturally significant genera. As we have noted earlier in our discussions of Numic terms for "tree," ecological prominence may also lead to the elevation of a generic to the status of a major life form (see Chapter III). Other examples are also cited by Berlin (1972:20-25).

Intermediate taxa, apparently the least significant recognitions in most of the biotaxonomic systems Berlin reviewed, are also the most difficult to account for developmentally (Berlin 1971:30). Berlin notes that in the cases he considered, only two situations seemed to account for the presence of intermediate categories. These were: 1) the introduction of new plant species into a region; and 2) further recognition of distinctive traits among already established specifics. Both situations might result in the elevation of generic labels to an intermediate position. In Tzeltal, for example, the form /ʔisim/ "corn" seems to have taken an added meaning "grain" with the introduction of wheat and sorgum to the region. Called respectively "Castillian corn" /kaslan ʔisim/ and "Moor's corn" /moro ʔisim/, these plants then formed a generic level contrast with "true corn" /bac'il ʔisim/ which already had several established species. Recognition of deciduous vs. non-deciduous properties among "oaks" /hehteʔ/ produced a similar contrast in Tzeltal between "true oaks" /(bac'il) hehteʔ/ (also with three species) and "armadillo-eared oak" /cekinib (hehteʔ)/ or live oak. Berlin (1972:31-6) cites some additional examples of the development of intermediate taxa in other languages, all similar to those noted.

True varietal taxa, or sub-specific recognitions, are held by Berlin (1972:28) to occur only in languages spoken by agricultural groups, and within these, only for cultigens. Varietal taxa develop from further recognitions of distinctive traits, and usually are marked by trinomial expressions, with double attributives. Examples from Tzeltal are "red ground beans" /cahal slumil cenek'/ and "black ground beans" /ʔihk'al slumil cenek'/ (Berlin 1972:30). Often these go through a process of abbreviation (Conklin 1962) whereby the generic designate is lost; i.e., /cahal slumil cenek'/ "red ground beans" becomes merely /cahal slumil/ "red ground(s)." A parallel English abbreviation in English is the expression "baby lima(s)" for "baby lima beans" (Conklin 1962:122). We will note some exceptions to Berlin's rule limiting varietals to agriculturalists below.

The appearance of a unique beginner for biotaxonomic schemes is seen as a final stage in the development of nomenclature. According to Berlin (1972:38), very few of the systems he reviewed had terms labeling this distinction, although many groups may covertly recognize such a category (see our earlier discussion, Chapter III). Terms used as unique beginners may derive from further generalization and extension of meaning for major life form names. This is apparently the case with the forms for plant in Latin and French, where an inclusive meaning for the term is not noted until the 13th and 16th centuries, respectively (Ullmann 1963:181). Unique beginners may also develop by a process of compounding several life form names (Berlin 1972:39). In Tzeltal, the compound /teʔ-ʔak/, literally "tree-vine" is occasionally used as an equivalent for "plant" in the inclusive sense.

Berlin's proposal of regularities in the evolutionary development of biotaxonomic nomenclature is of particular interest given the Numic data. Within the Numic systems, the importance of a concept of genus is also readily apparent (see Chapter III). A range of specific categories is also recognized in all schemes. A few intermediates are present, and these can often be traced to the elevation of significant generics. Major life forms, however, appear to be of a different character, usually calling attention to morphological principles. Varietals appear to be rare to absent. Unique beginners, except perhaps in Southern Paiute, are not well developed. The importance of Numic orientations to use has also fostered some categories that do not fit strict taxonomic concepts. There is also no historical evidence within the Numic schemes to suggest the temporal priority of major life forms over intermediates. However, noting both the similarities and discrepancies, we will now attempt to analyze the historical development of the Numic biotaxonomic schemes by using some of Berlin's principles. We will also call upon some further observations by Conklin (1962), Romney (1967) and others.

B. Numic Biotaxonomic Nomenclature

1. Generics

Lexemes labeling categories that are commonly described by Numic speakers as the basic units in their biotaxonomic lexicon are of three general classes. The first class, and by far the most common in all systems, is made up of forms with a relatively simple structure, usually consisting of a single morpheme with or without a classifying suffix. Examples of those without classifiers are: [wái] Indian rice grass, [akɨ́] sunflower, [tɨn.á] antelope, [kamɨ́] jackrabbit, etc., in Northern Paiute; [áka] tansy mustard, [tuʔú] Orobanche spp., [sɨná] king snake, [tɨʔí] deer, etc., in Southern Paiute; and [kána] bitterroot, [cɨ́ʔna] thistle, [yáha] ground hog, [áni] red ant, etc., in Shoshoni. Examples of forms with classifiers are: [cudú-pi] Ephedra, [túu-pi] mountain mahogany, [madá-bi] woodtick, etc., in Northern Paiute; [pohóm-pi] currant, [tɨwám-pi] service berry, [poʔá-bi] louse, etc., in Southern Paiute; and [tɨ́siipɨ] salt grass, [hɨ́na-bi] bitterbrush, [mú?um-bi] owl, etc., in Shoshoni. Classifiers, especially of the shape /-pi/ /-bi/ and /-pɨ/ /-bɨ/ are more common on plant names than on those for animals. Although their use is not fully understood as yet, their presence often denotes the concept "whole plant" as opposed to "plant product," as described in Chapters III and V.

Following Conklin's (1962:122) suggestion, lexemes of this first class may be called "unitary lexemes" or expressions " . . . no segment of which may designate categories which are identical with or subordinate to, those designated by the forms in question." Based on structural criteria, those without classifiers can be called "unitary simple lexemes," or forms whose linguistic structure prohibits further segmentation. Although those with classifiers technically have a segmentable structure, their behavior in morphologically complex constructions leads me to consider them also as unitary simple lexemes.[20]

A second and also relatively common class of generics in the Numic systems consists of lexemes that are either morphemically complex or compound. Since forms of this second class also meet the semantic criteria outlined for unitary lexemes, they can also be considered as such. However, using Conklin's (1962:122) terminology, they are "unitary complex lexemes," or forms with a segmentable structure. Many of the

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[20]In compounds, the suffixes -/pi/ -/bi/ and -/pɨ/ -/bɨ/ are usually dropped; i.e., in Northern Paiute, "willow" is [sɨɨbi], but "willow cup" is [sɨɨzida], etc.

compounds in this class have transparent etymologies. Examples are: [izá?a s.in.á] "coyote's urine" (prickly poppy), [kamɨ́ s.igí] "rabbit's intestines" (Glyptopleura marginata), [nɨmɨ́ n.aká] "Indian's ear" (mushroom), [k^{w}idágagai?i] "defecates a lot" (magpie) for Northern Paiute; [nagá tocíbɨ] "mountain sheep's testes" (strawberry), [sóog^{w}ananabɨ] "underarm smell" (cleome), [páag^{w}ananabɨ] "water smell" (mint), [óiči kwasɨ] "chipmunk's tail" (yarrow), [nɨŋ^{w}ɨ́ madɨ́nampɨ] "people chaser" (collared lizard), etc., for Southern Paiute; and [k^{w}idák^{w}anna] "feces smell" (lupine), [tóyabi tɨ́bɨ?a] "mountain's penis" (mullein), [úbazapiabɨ] "barren mother" (dodder), etc., for Shoshoni. Most of these are descriptive compounds, referring to some prominent morphological feature of the plant or animal, or to some characteristic activity associated with the form.

Complex lexemes of various structural types also occur as generic labels. Some of these may have a segment with recognizable meaning, as for example, Northern Paiute [pacúgu] beaver and [patákai?i] racoon, both containing what is probably the prefixed form for "water" /pa-/. Others seem to have lost at least their popular etymologies.

A third general type of generic lexemes can also be recognized in the corpus. These are also compound and complex forms, but ones whose semantic characteristics do not allow them to be defined as "unitary" lexemes. These forms, termed "composite lexemes" by Conklin (1962:122) have a segmentable structure, one component of which under specific conditions may designate a category either subordinate to or more inclusive than itself. Although complex lexemes may also function as specifics (see below), those types forming Numic generics shall be defined here as complex forms lacking true attributives. Examples of these are less common in all systems, but they nonetheless occur; i.e. from Southern Paiute [tɨmpí maʔábɨ] "rock plant," labeling the generic lichens, and [muí maʔábɨ] "milk plant," labeling the generic milk weed. Both of these forms contain the more generalized segment [maʔábɨ] "plant." Other examples include the designates described as "water" forms; i.e., "water-juniper," or "water-(rattle)snake," found in all taxonomies but with varied referents. These forms label terminal taxa that are considered by informants to be "like" the forms in question, not subordinate to them. They are thus comparable in function to other generics.

If we compare the generic lexemes of these three types from our Northern Paiute, Southern Paiute and Shoshoni corpus (see Chapter III), as well as from various published and unpublished sources (see Chapter II, Chapter IV), a significant number of correspondences emerge. If we add to these comparisons from the other Numic languages, e.g. from Mono (Lamb 1957; 1958b; Steward 1933), Kawaiisu (Klein 1959; n.d.; Zigmond 1941; 1971) and Panamint (Good 1964; Lamb n.d.), yet others are added and/or broader distributions recognized. Tables 2 and 3 summarize the data for 154 sets of generics referring to plants and animals for which there are reported correspondences in at least two of the three sub-branches of Numic. A high percentage of these sets involve lexemes of

Table 2: Numic Plant Generic Cognates

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
1. Manzanita (a)	+	+	-	a-ra-dum-pip (Ceanothus)		hã:dʌbi:Bɨ	adadampibɨ	
"tobacco mix" (b)		tɨmaiyaʔa		tɨmayɨha	timəyhə (unident.)		koʔa taʔman-umpɨ	tamanampɨ
2. Tansy mustard	a'tsã	aca	-	+	-	'akavy	aqa	aqa
3. Sunflower	pàk~o'ka	akɨ		akkɨ	-	-	akɨmpɨ	akɨmpɨ
4. Squawbush (berry)	-	-	-	itcipɨ	itse (unident.)	ičiši	iʔiši	išibɨ
5. Chenopodium (a)	-	ɨappɨ	ʔUmbɛ a seed	ɨʔapɨ	-	-	-	-
(b)	köyo (fremon-tii)	-	-	koka (humile)	-	kɨbɨ (weed)	kobɨ fremon-tii)	koobɨ (fremon-tii)
6. Mint		paak^{w}anna?a	-	paag^{w}annaʔa	-		pag^{w}ananam-pɨ	pag^{w}oi-nanampɨ
7. Chia	pasida	-	-	patusiipa poverty weed		pasida	paaci	paasi
8. Currant	pogobic	pogopisa	-	pogombi	huaboko: tupoko	pɔhʌbi	pohompi	pagombi
9. Clover	posida	pozidapɨ	-	petɨsi	pak3:tso	pa:ziwatubbɨ	-	-
10. Tobacco (a)	pahmuh	puibahmu	pahombi	puhibahmu	-			
(b)						soʔodɨ	k^{w}oʔapɨ; sog^{w}ok^{w}apɨ	sagowaʔapi
11. Pinyon	tɨpa-pɨ	tɨba-pi	tɨba	tɨba	-	tɘvap	tɨba-pɨ	tɨbapɨ

Table 2: Numic Plant Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
12. Service berry		tɨa-bui	-	tɨam-pi	-	tɔ(ɣ)a-və tɨavɨ	tɨa-bɨ tɨwa-mpɨ	tɨabɨ tɨwampɨ
13. Salt grass	-	tɨzi-bi	-	tɨs.i-pɨ	-	-	-	-
14. Cattail	-	toi-bɨ	toypɨ	to?i toipɨ	-	to?ivɨ	to?oi-bɨ	to?oibɨ
15. Indian Balsam	-	tooza?a	-	tooca?a	-	-	tonča-bɨ	-
16. Greasewood	-	tono-bi	-	tono?o-pi	-	-	tono-bɨ	tonobɨ
17. Chokecherry	-	+	-	to?nambi	paviaro?na? (big plum)	-	tono-pɨ	tonopɨ
18. Ephedra	-	cudu-pi	-	tutum-pi	-	tutupivə	tutu-pi	tuu-pɨ
19. Orobanche	-	tuhu	-	tu?i	-	tu?u	tu?u	tu?u-bɨ
20. Biscuitroot (a)	-	tunuyu	-	tuna	tunha (Cymopterus)	tsuns	tu?una tu?na	-
21. Mountain mahogany	wahtunahpɨ tonap	tuupi	-	tunam-pi	-	keezi- wahntɨbɨ	tunam-pɨ	tunampɨ
22. Pine or Fir	-	kataabi	-	-	-	wagika- katʌbbɨ wayha:- kʌtʌ-bbɨ	-	-
23. Bitterroot	-	kanɨtja	-	kana	-	-	ka?anci	-
24. Shadscale (?)	-	kaŋɨpɨ (medicine)	-	kaŋgɨmpi	-	-	kaŋɨmpɨ	-

Table 2: Numic Plant Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
25. Onion (a)	-	kɨka	-	kɨŋga	kʌʌka ~ kʌka	-	kɨŋka-bɨ	kɨŋka ~ ɨŋkabɨ
26. Elderberry	kunuki-pɨ	kunugi-bɨ	-	kunugi-pɨ	-	-	kunuk^{w}i	kunug^{w}i-bɨ
27. Menzelia	-	kuha	-	kuhma kuhwa	-	kuʔuvə	kuʔu	-
28. Lupine	-	k^{w}idapo k^{w}idak^{w}anaʔa	-	k^{w}idak^{w}anna	-	-	-	-
29. Biscuitroot (b)	-	haapi hapiʔi	-	haapiʔi	-	-	-	-
30. Bitterbrush/ Cliffrose	-	hɨnabi bitterbrush	-	hɨna-bi hɨnaʔa-bi bitterbrush	-	hənavə bitterbrush	ɨna-pɨ Cliffrose	ɨna-pi Cliffrose
31. Biscuitroot (c)	-	huni-bui	-	huniba	-	-	-	-
32. Birch	-	huucabɨ	-	huʒa-bɨ hug^{w}iǰa-pɨ	-	pawičuʔuvɨ	-	-
33. Lycium	huʔupu-hia; hupu-hya	huu-pui	hopy	huupi	-	huʔupivɨ	huʔupi uʔupi	aŋkaʔapɨ
34. Mushroom	tahsihtu	+	hitoʔ	-	-	hi:tʔɔppI	iitampɨ hitadɨ hitoʔo	-
35. Onion (b)	-	sii	-	-	-	-	ciʔi	
36. Rose	tsiava	cia-bui	-	ciʔambi	-	čiyavipɨ	ciʔampibɨ	ciampibɨ

Table 2: Numic Plant Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
37. Narrow-leafed cottonwood	-	saga-pi	-	saga-pi	-	-	sagapɨ	-
38. Sage	sawavuya	sawa-bi	-	+	-	-	saŋʷabɨ	sawabɨ
39. Tule	saiva	saibɨ	sai-pip	saipɨ	-	seevibɨ	saimpibɨ	saimpibɨ
40. Sego	sigo	sigo	-	sigo	siko: a root	-	sigoʔo	ṡigoʔo
41. Rabbitbrush	sigupi	sigupi	-	sibapi sibupi	-	siβʌppɨ	sɨkumpɨ	sɨpumpɨ
42. willow	sɨhɨpɨ	sɨɨbi	sɨbi	sɨhɨbi	s3h3bui Rhus	sɨɨbɨ Rhus	sɨʔɨbi Rhus	sɨʔuv Rhus
43. Aspen	suŋava Cotton-wood	sɨŋabi cotton-wood	-	sɨnabi	-	-	sɨabɨ	sɨnabɨ
44. Cottonwood	sohopɨ	soobi Aspen	soobippɨ	sohobi	sohɔboko red mul-berry	sɔbipɨ	soobipɨ	soobibɨ
45. Grass (a)	sona	-	-	soni-pɨ	sonipʌ	-	-	-
46. Atriplex?	sunüʔü	sun.u	-	sihmu suno	-	-	-	-
47. Thistle	-	cɨna	-	cɨʔna	ts3n	-	ciŋa	ciŋapɨ
48. Grass (b)	mono	mono-bɨ	-	mono	-	-	monompɨ	-
49. Cactus (a)	-	-	-	mɨzaʔa	mitsa	-	munčɨ	-
50. Cactus (b) prickly pear	-	nabu	-	nava nahbompɨ	-	nabɨbɨ	nabumpɨ	-

Table 2: Numic Plant Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
51. Onion (c)	-	muʔa	-	awamuʔu	-	-	muʔunci	-
52. Seepweed	wata	waada	-	wada	-	-	wada waada	-
53. Grass (b)	wahava	wahabɨ	-	waabi waʔabi	-	-	waabɨ wahabɨ	waʔabɨ
54. Juniper	waʔah-pɨ	waapi	-	waapi	waahpi	waʔadɨ waʔandɨbi	waʔapɨ	waʔapɨ
55. Rice grass	wai	wai	-	wai	-	weʔevə	waʔi; waʔai waʔaibɨ	waʔaibɨ
56. Hemp	-	wiha	-	wiha	-	-	wɨibɨ wɨʔivimpɨ	wɨʔ'bi
57. Oak (a)	wijahpɨ	wiya	wiya	-	-	pawiʔabi		
(b)						k^{w}iyabɨ	k^{w}iabɨ	k^{w}iabɨ
58. Buffalo berry	-	wia-pui	-	wiʔyɨmbi	-	-	wiyɨmpipi (Mahonia)	wiyampibɨ
59. Pine, ponderosa	wohqo-pɨ	wogopi	wɔng^{w}ɔbe	wonoʔobi	wokoobɨ	wʌhɔnʔʌbʌ wohodɨ	ogompɨ	-
60. Sweet Potato	yaʔap	yapa	-a	yamba	payaapw	yambodɨ	yampa	yampa
61. Pine (b)	jepih-pɨ	-	-	-	-	yɨvibbɨ yɨwimbɨ	yuwimpɨ	yuwimpɨ
62. Onion (d)	-	padɨzi	-	petɨsi				
63. Grass (c)	kuki	-	hug^{w}ippɨ	piahug^{w}i	-	hug^{w}i	uk^{w}iibɨ	uk^{w}iibɨ
64. Algae	pajoqa-pɨ	-	-	paiʔyogapɨ				
64. Water Juniper	-	pawaapi	-	paŋwaʔabi	-	-	paŋwaʔapɨ	

Table 3: Numic Animal Generic Cognates

		Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
1.	deer	tɨhɨhta	tɨhɨʔya	tɨiyɨ	tɨhɨya	tʌhʌʌya	tɨhɨyI	tɨʔi	tiʔi
2.	elk	-	paatɨhida	-	pa:Rᶜhi (S) patɨgɨʔa	-	-	padɨhia	pari
3.	buffalo	-	kucu	-	piagucu	kuhtsuʔ nʌmʌkuhtsuʔ	-	kuču	kuc
4.	(mountain sheep)	pohniika	koipa +	-	tuku +	-	nage	naga	nagaci
5.	(antelope)	+	tɨnna +	-	wanzi (♂)	-	-	wanci	wancici
6.	(horse)	qawaajuʔu	puku	kavayɔ	puŋku	puku	wɔʔɔrÏbɨ	puŋgu (Pos.) qava	kava
7.	bear	pa-hapihci	wɨda	pahə̃wIc	padua wɨdaʔa	+	pɔwɔtI	papawa kʷiyagantɨ	kʷiagantɨ
8.	jackrabbit	qahmɨ	kamɨ	kəmmI	kammɨ	-	ka·mɨ	qamɨ	kamɨnci
9.	showshoe rabbit	tohsah-qahmɨ	toha-kamɨ	-	tosa-kammɨ	-	-	tosaqamɨ	
10.	cottontail	tapu (small rabbit) +	tabuʔu	tawʊcIʔ	taʔabu	tabuʔkinaʔ	tawbÏtse	tabuci	tavuc
11.	wolf	toʔohpi	ʔiša	tɔɔpɛ	piaʔižapɨʔɨ	-	nɨwʌgawɨdɨ	piasɨnaʔabi tɨvaci	
12.	coyote	ʔihsaʔa	ʔizaʔa	ʔišaβayp	ižapɨʔɨ	+	sɨnaʔabi	sɨnaʔabi	yokopɨci
13.	fox	haʔwohcaʔa	waciaʔa waaŋi~ kʷaŋiʔi		waaniʔi		wozia	onciaci tavaŋʷaimpici	
14.	fox		yɨŋaʔi	yipəcɨ	yɨpe			yəpatsɨ	
15.	dog		sadɨʔɨ		sadiʔi	sadiiʔ	sadii	sadiʔi	sadii(cI)

Table 3: Numic Animal Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
15. bobcat	tukawis (G)	tuhuʔu	-	tukubiči	-	tʊkʊtse	tuqu	musuntuku-pɨci
17. mountain lion	tsuka (G)	kak^{w}iduhuʔutʊkʊmʊc		toyadukɯ tukumunci	tʌ-mah-kupaʔ	tʌkʊmhɨ̈:tse	tuqumumuci	tuq^{w}
13. skunk	pohihta	poniʔya	pɔniac	poneci	pisuniiʔ	ponniyʌ	poni	poni
19. porcupine	mɨhɨ	mɨha	-	yɨhnɨʔɨ	yɨhnɨ	-	yɨŋɨmpɨci yɨʔɨmpɨci	yupac
20. badger	trunao (G)	hunna	nunə	huna	-	hunʊtse	ʔunampɨci	uhapuc
21. beaver	pacuhku	pacugu	-	panzoku (otter)	-	-	paacuqu	pawɨc
22. racoon	pahtahqai	patakaiʔi	-	pang^{w}ida	paruukuʔ	+	tak^{w}adipɨ	-
23. weasel	sɨhsɨka		yɛsɨga	pabici	- -	sIsiga	pabicici	-
24. woodrat	qawa	kawi	kawə	kaʔaci	kahuuʔ (mouse)	ka:ze	kaaci kaaču	katacɨ
25. gopher	mɨjɨ	+	+			mɨ̇yɨ	mɨyɨmpɨci	
26. ground hog	+	+	ʔiyəbIč	yaha	-	-	yaʔampɨci	
27. ground squirrel	-	kɨɨba	-	kɨɨpa	-	-	kɨmpaci	
28. ground squirrel	ʔehk^{w}ɨ	ʔik^{w}ɨ	ʔæŋwə	-	-	ʔewʊtse		aq^{w}isic
29. squirrel		ciipisa		ciipi			sɨpi	
30. squirrel, golden mantled ground	tuwoi (G)	wobiziʔi	-	woʔi (chipmunk)	-	wʌʔɔytsize	oici oʔoitsici	
31. prairie dog	-	-	-	tɨnzant	-	-	-	tucuʔe

Table 3: Numic Animal Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
32. chipmunk	–	taba	tabəʔay			wʌwʌtʌbʔaze	tabaʔaci	
33. mouse	puweci	poŋaʒi	pʊ̃way	ponai		pʊmitsarez	puʔicici	puʔicec
34. field mouse		pamotoʔo	–	pamoheʔya				
35. bat	hoʔnopi	pigahanna	ʔapaacənəč	hoinobiči		ʔagatsanɨ- zeʔe	paacaci	
36. eagle, golden	k^{w}iʔnaaʔa	k^{w}iʔnaʔa	–	k^{w}iʔnaʔa		q^{w}anʌzze sparrow hawk	q^{w}ananci	q^{w}anac
37. eagle, bald	–	pa-si-a (H)	–				pasi	
38. owl	muhu	muhuʔu	mumbɪč	muʔumbi	sɨhɨmupici	muhʊtse	muupɨci	mupac
39. owl, burrowing	–	kuhuʔu	–	kuhuʔu			kuk^{w}ugutsi (Chemehuevi)	
40. buzzard	wiho	wiho	wiyɔmbɪč	wikompici	+	wikɨmba:ze	wikumpɨci	wig^{w}
41. turkey	–	–	–	ko-oi-nit (H)	kuyuniiʔ		kujuita (Chemehuevi)	q^{w}iyut
42. chicken hawk	kini	–	–	kiniʔi				
43. red-tailed hawk	–	nakaʔi	–	tosanakaʔi (chicken hawk)			kɨdinaŋkaci	
44. sage hen	–	huzi	–	hučaʔa			cičaʔa	
45. duck	pɨjɨ	pɨhɨ	p^{w}iyyə	pɨɨye pɨihu	pɨda		+	
46. mud hen	pa-hsaja	saiya	–	saiya seya		sapuze		
47. goose	+	nagɨta	nɨgɨndə	nɨgɨnda		ʔɔɣʌkʌppe	ɔbanɨŋka	
48. quail	tahkaahkaa		–				nakaʔa (C) (crane) takata	

Table 3: Numic Animal Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
49. heron	wakits (G)	wasa	wasə					
50. sandhill crane	kodito (G)	kor-de-deʔu (H) ko-ri-di (P)		koan-dâ-tǎ (H)			qocaitoicɨmɨ	
51. killdeer	patɨhcihnii (ouzel)	padɨʒiniʔi		tɨʔwiʔi pɨntɨʔi			pantɨkɨci (ouzel) pagantɨgɨic killdeer	
52. dove	heewii	ʔihobi	hewi	hewiʔi		hɔyɲbe	aiyobɨ hiyobɨ	
53. meadow lark	nocito	pazidonoʔo		hitoʔo		ʔɲ̃sɔrɛ	icooci itoci	
54. crow	karapuc (G)	ada		kakh kʷiʔada	ka:k	attakʌze	atapɨci	kāk (H)
55. blackbird		pakodobɨ		paganzuku		paɣazɔkʌze	pagancaqapɨ	
56. pinyon jay		aŋa					aaŋa aŋanci	
57. blue jay	caiqoʔno		c̃aipIč́	caipici			caiyakaci	
58. blue jay	coohcoohhnȃ			toogoci		cuki-ze	coʔoinkɨ	
59. robin	suuku	ʂugu		suikuku			cikunumpɨ	
60. junco (?)	tohoʔna						toogo	
61. mocking bird	muciʔuoina						musigaici	

Table 3: Numic Animal Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
62. magpai	+	kʷidakagaiʔi		kʷidabu				
63. tortoise	añya (G)	koʔya	wIdʊgʷiyʊ ʔæməci		+		aiya	ayi (lg) ayapuc (sm.
64. frog	wacaqaʔ	+	əɣəttə	wagaʔniʔa		wogatə	wahata~ wagata	
65. rattlesnake	toqohqʷa	togogʷa	toɣɔwa	togoʔa		tɔgʌwa	togoabɨ	togoʔev
66. water snake	pahtoqowa	paatogogʷa				pɔrŋwʌ~ podogowa	paatogoabɨ	paruʔowav
67. snake sp.	pahsiqohqʷa (gopher sn) pasogo (G) (water sn.)	pahoobɨ (bull sn.)	pasugu (snake)	pasinkoko (water snake)			pasigo (water sn.)	pasigok (grey sn.)
68. blowsnake	kololki (G) (king sn.) (loan?)			koko blow snake		kʌɣʌ (king sn.)	kogompɨci (blow sn.)	koqʷ (bull sn.)
69. lizard	pogoʔya		pɔɣɔ̃way	pogoziʔya	paʔpoosiʔ	+	+	
70. lizard	muhkuhta	muguzu				mugugɨze		
71. horned toad		magazaʔa		macanginaʔa			makataci	makacac
72. salmon	ʔaaqai	agai		agaiʔi				
73. fish	pahkʷi	pakʷi	pauni	peŋgʷi	peekʷI	pagɨze	pagɨci	pagɨ
74. catfish		musuipagʷi	mɔcɔpãŋʷi				musuičiantɨ (Chemehuevi)	macapagɨ
75. grasshopper		hoatataʔa	ʔaatəŋgi	ʔateŋgiʔi	ahtakiiʔ	ʔa.ťakapize	ʔatankapici	atʔkac

Table 3: Numic Animal Generic Cognates (Cont.)

	Mono	Northern Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	Southern Paiute	Ute
76. ant	+	ha?inabi		ani	enka?ɨnɨi?	aŋabi		
77. ant		ani	t̃asiə̃c	tasimica		tasi.bi	tasiabi	tasi?ev
78. flea	?anipi					?aŋibi	aŋivici	
79. louse		puzi?i	pusiabi	puzi?a		pɔ?ŋbi	po?abi	pɨ?ɨv
80. locust	kɨ?a	kɨa		kɨa			kɨ?a	
81. cricket		nizu	+	mižo?o			makačaci	
82. fly	miuipi	muibi	muibiya	animui	animui	mɨ?pizE mu:pIzE	muupici mopici	muwav
83. mosquito	maa?na	wɨponɨ	w̃əwədə	mopo?o wa?wa?ada	mohpoo		mo?aŋibɨ	+
84. yellowjacket (?)	pena	akubina (P)	pəənə	peina peya				piya
85. butterfly	sa?naaci (cocoon)							nanasic
*...(h)pu(uhs)V (K)	wa?nahpuuhsa			aiputonki?i		?asibu-ze		
86. catterpiller	pijakɨ			piakɨ		pi?ʌggah (cocoon)	piyagu	
87. worm	wo?api	wo?abi		wo?abi	wo?aabi	wʌ?ŋbI	+	
88. tick		madabi				mumma·ze	matavi	mɨtac
89. spider	co?ahpe?	soada	naasəwata (tarantula)	wanaso?aci		ŋʌsɔyaɣize (tarantula)	hokoso?avi (Chemehuevi)	
90.	hohpohpo?					hok^{w}ambi	hok^{w}ampɨ (tarantula)	muq^{w}ap

the unitary simple type (135 sets, or 87%). Those of the unitary complex and composite types account for only minor percentages in the data (15 sets for 10% and 4 sets for 3%, respectively). Romney (1967) following Sapir (1916) also makes similar projections correlating the age of kinship terms with their relative length and linguistic complexity.

Many of the sets presented in the tables evidence sufficient correspondences to suggest their reconstruction as Proto-Numic generics. However, since the data are incomplete distributionally (see Tables), perhaps more as an artifact of collecting procedures over the years than as reflecting actual absences, and since the early history of Numic may have been quite complex in terms of inter-dialect and inter-language exchange (see Chapter II), it seems preferable to consider these data in a wider distributional context. For this purpose, we will compare them with forms from the other non-Numic northern Uto-Aztecan languages treated in Chapter IV; specifically with Tübatulabal, Hopi, and the various Takic languages, including Luiseño, Cupeño, Cahuilla and Serrano. On the basis of these distributions, along with preliminary considerations of proto-phonology and proto-morphology,[21] we are able to recognize sub-sets of forms of varying

[21] There are no thorough studies of Proto-Numic phonology or morphology as yet. Voegelin, Voegelin and Hale (1962) consider data from Southern Paiute, Mono, Bannock and Comanche in their reconstructions of Proto-Uto-Aztecan phonology. Miller (1967) gives consonant and vowel correspondences for Southern Paiute, Mono and Comanche in Uto-Aztecan study. Nichols (1970) has suggested a phonological reconstruction for Proto-Western Numic, and Liljeblad (1966) has noted some inter-Numic correspondences with historical

genetic validity and age. Before we proceed to these comparisons and reconstructions, however, some general points with reference to the identification and equation of proto-generic forms with modern botanical and zoological genera need to be raised.

As has been noted previously (see Chapter III), the Numic generic, and probably also the Proto-Numic generic as well, need not be isomorphic with the generic of modern bio-taxonomy. As can be seen by referring to Tables 2 and 3, correlations of present-day Numic generics with modern taxonomic genera and/or species, may be warranted in some cases but not in others. Some Numic generics refer quite clearly to modern genera. Examples include ephedra (Table 2, no. 18; Ephedra spp.), greasewood (Table 2, no. 16; Sarcobatus spp.), hare (Table 3, no. 8; Lepus spp.), cottontail rabbit (Table 3, no. 10; Sylvilagus spp.), etc. Other Numic generics refer quite clearly to a single species within a genus, or at most to a few species. Examples of this type of correlation include the forms for Indian balsam and bitterroot (Table 2, nos. 15, 23), both ascribed to the botanical genus Lomatium; pinyon and ponderosa pine (Table 2, nos. 11, 59), both Pinus, three and perhaps four generics for onions (Table 2, nos. 7, 25, 35, 51), all Allium; two and perhaps three ground squir-

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implications. However, since phonological patterns have not been satisfactorily established for all languages, work on proto-phonology is a bit premature. Reconstructions provided in this thesis do not fully account for these problems, and thus represent only a convenient shorthand for discussion of forms.

rels (Table 3, nos. 27, 28, 30), all Spermophilus, etc. Yet others, such as the modern referents for cliffrose and/or bitterbrush (Table 2, no. 30; Cowania and/or Purshia), ant (Table 3, no. 76; family Formicidae), grasshopper (Table 3, no. 75; family Acrididae), etc., are more inclusive than modern genera.

Referring again to the observations of Bartlett (1940), Berlin (1971), Bulmer (1968), and to our own findings summarized separately (see Appendix A), the origin and development of the native generic seems to be dependent on the culturally channeled observation of actual continuities and discontinuities in nature. As such, the correlation of the native generic with a taxonomic genus may be dependent on several factors, such as the relative homogeneity vs. heterogeneity of that genus, or the number and nature of its species, its general distributional features, and perhaps above all, the cultural importance of the forms in such areas as subsistence, manufacture, medicine, religion, mythology, etc. We can suggest (see Appendix A) that if a genus is naturally homogeneous, ecologically prominent and culturally important, we can expect a close correlation between it and the native generic. If conditions other than these obtain, however, the native generic may be either more or less inclusive than that of the biotaxonomist.

There seems little reason to doubt that these factors would not also have been operative in early periods of Numic linguistic and cultural history. However, three additional factors need to be considered when identifying referents for forms in some proto-period. These are: 1) the possible influence on modern referents of environmental change (Friedrich 1970); 2) the possible influences of cultural and/or territorial change (migration); and 3) the influence of mutually exclusive species distributions. Our consideration of 1) is somewhat hampered by the lack of specific paleo-ecological data for much of the region. However, what studies there are (Martin 1963; Martin and Mehringer 1965; Mehringer 1965) seem to indicate no significant vegetational change within the last 3,000 years.[22] With regard to points 2) and 3), which are in part interdependent, some difficulties do arise; namely, when migrations are suspected or assumed, possible changes in referents and peculiarities in geographic distributions for various genera and species need further consideration. Most of the botanical and zoological genera associated with the Numic generics are quite widespread in western and southwestern North America. The various species of these genera, however, have more limited and often mutually exclusive distributions (Munz, Keck 1963). In those cases where we may be dealing with mutually exclusive species, choosing a proto-referent can be biased by a priori

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[22]These data are scant for the Great Basin region. Martin (1963) summarizes for the Southwest, noting problems with correlations of pollen diagrams with changes in climate. Mehringer (1965) discusses data for southern Nevada, based on studies at Tule Springs. Baumhoff and Heizer (1965) also give a preliminary survey of the other Great Basin regions, but from scant resources. Most of the debate centers around the possibility of changes to conditions drier than at present at about 5,000 B.C. (the Altithermal). If this dry period occurred, most feel that its effects did not go beyond about 2,000 B.C.

adherence to a specific hypothesis of origins; i.e. to favor Lamb's (1958a) hypothesis of a proto-Numic homeland in or near Death Valley, California, would be to choose arbitrarily eastern and southern Californian species as the proto-referents. Although it would be useful to have valid species identifications when these distinctions are implied by the proto-generic, proposing them without due caution would further bias considerations of the nature and possible location of Proto-Numic environments.

With these various cautions in mind, we will now proceed to a consideration of the various Numic generic sets given in Tables 2 and 3 with possible reference to their reconstruction as the generic members of a Proto-Numic biotaxonomic system. On the basis of distributions in northern Uto-Aztecan languages, as well as preliminary considerations of proto-phonology and proto-morphology (especially as they help to establish borrowings), we can recognize four sub-sets of generics with varying historical validity in these data. These are as follows (see Tables 2 and 3):

a. Set I. Set I comprises forms that are strongly reflected in Numic, being found in at least one language of each of the three sub-branches, and also in at least one other northern Uto-Aztecan language. These forms also appear to reflect regular and predictable sound correspondences--at least in as much as these can be identified in the various renderings. All of these forms are unitary simple lexemes, and all save two have a structure characteristic of simple stems or roots.[23] This set probably predates the internal divergence of Numic, and possibly the divergence of the Numic dialect from one or more other northern Uto-Aztecan dialects or languages (see also Chapter VI). Set I, with suggested *Proto-Numic* reconstructions, tentative referents and language distributions is as follows (see Table 4 for language and other abbreviations as well as a listing of the sources for other suggested reconstructions):

Plants

*pakɨ^n- ∼ *akɨ^n-, a sunflower, probably *Helianthus annus* (seeds). M, NP, S, (SP), U, Cu, Ca, L, (P-C *paʔaqʔ, sunflower), Sr, H.

*pogo^n-, a currant, probably *Ribes aureum* (berries). M, NP, S, (C), K, (SP), U, T (UAC #38, *poko, berry).

*tɨba, pine nut, probably *Pinus monophylla*. M, NP, S, K, (SP), U, CU, CA, L (P-C *tevat, conifer sp.), H, T. (UAC #319, *tepa, pine nut).

*tɨwa^n-, service berry, *Amelanchier utahensis* and/or *A. pallida*. NP, S, K, (SP), U, CU, H.

*tono-, greasewood, *Sarcobatus vermiculatus* var. *Baileyi*. NP, S, (SP), U, H.

*tutu^n-, Ephedra, *Ephedra* spp. NP, S, K, (SP), U, T, Ca, H?

*tunna, a biscuitroot, *Lomatium* sp., (*L. macrocarpum*, *L. nevadense*) perhaps several but not all. NP, S, (C), K, (SP), U, H.

*koo, a chenopod, probably *Chenopodium Fremontii*. M, NP, S, K?, (SP), U, L, CA, H?

*kuʔa∼*kuma, blazing star, *Mentzelia albicaulis*. NP, S, K, (SP), T.

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[23] See Nichols (1970) for suggested root morpheme structure in Western Numic as (C)V(')(CV(')); Dayley (1970) gives CV(V)(C) for Shoshoni, noting certain rules for determining the optional members.

Table 4: Abbreviations and Sources

Mono, M	Including Northfork (Lamb 1957; 1958b) and Owens Valley Paiute (Steward 1933)
Northern Paiute, NP	Including all groups, as per field data in Chapter III; also Liljeblad (1966); Maher (1953); Kelly (1932); Train, Hendricks and Archer (1941); Steward (1938)
Panamint, P	Good (1964); Lamb (n.d.)
Shoshoni, S	Including all groups, as per field data in Chapter III; also Chamberlin (1905); Hoebel (1934) Wick R. Miller, personal communication 1971; Shimkin (1947); Train Hendricks and Archer (1941)
Comanche, (C)	Carlson and Jones (1939); Conange (1951; 1958)
Kawaiisu, K	Klein (n.d.; 1959); Zigmond (1971)
Southern Paiute (SP)	Including all groups, as per field data in Chapter III; also Kelly(1964); Sapir (1910; 1931)
Ute, U	Including all areas, as per field data in Chapter III (Richfield, Utah); also Goss (1961; 1962); Collins (1876); Chamberlin (1909);
Hopi, H	Voegelin and Voegelin (1957); Whiting (1939) and personal communication 1969; Mearns (1896)
Cupeno, Cu	Bright and Hill (1967); Hill (1966)
Cahuilla, Ca	Barrows (1900); Bright (1967)
Luiseno, L	Kroeber and Grace (1960); Bright 1968).
Serrano, Sr	Hill (1967); Miller (n.d.)
Tübatulabal, T	E. Voegelin (1938); C. Voegelin (1958)
Proto-Cupan, P-C	Reconstructed by Bright and Hill (1967)
Proto-Mono-Kawaiisu, P-M-K	Reconstructed by Klein (1959)
Proto-Uto-Aztecan, P-U-A	Reconstructed by Voegelin, Voegelin and Hale (1962)
Uto-Aztecan Cognate Sets, UAC #	Cited by number, as in Miller (1967)
Voegelin, Voegelin and Hale, VVH #	Proto-Uto-Aztecan sets as reconstructed by Voegelin, Voegelin and Hale (1962), cited by number
Western Numic, WN	
Central Numic, CN	
Southern Numic, SN	

*kunuk^{w}i, elderberry, _Sambucus melanocarpa_. M, NP, S, (SP), U, T, L.

*tɨmaya-, tobacco mix, probably manzanita (_Arctostaphylos_ spp.) (see below). NP, S, (C), (SP), U, T.

*toʔi, cattail (_Typha_ spp., but perhaps only _T. latifolia_. NP, S, P, K, (SP), U, L, T.

*hɨna-, bitterbrush and cliff rose, _Purshia tridentata_ and _Cowania mexicana_ var. _stansburiana_. NP, S, K, (SP), U, H, L?, Ca?

*hug^{w}i, wheat grass, _Agrophyron_ spp., but perhaps not all. M, P, S, K, (SP), H, T. (UAC #203, *huk^{w}i, grass).

*sai^{n}-, tule, _Scirpus acutus_. M, NP, S, (C), (SP), U, T, L (Nichols 1971, suggests *saki, and matches to UAC #328, *saki, popcorn).

*saga-, narrow-leafed cottonwood or tree willow, _Salix lasiandra_. NP, S, (SP), U, T, L, Ca, Sr.

*sigo, sego or _Calochortus Nuttalli_. M, NP, S, (C), (SP), U, T.

*sibu^{n}-, rabbitbrush, probably _Chrysothamnus_ spp., but see also intermediate categories, below. M, NP, S, K, (SP), U, T, H.

*soho-, cottonwood, _Populus Fremontii_. M, NP, S, P, (C), K, (SP), U, H. (UAC #104, cottonwood tree).

*cɨnna, thistle, _Cirsium_ spp., but perhaps not all. NP, S, (C), (SP), U, H, T, L, Cu, Sr.

*sɨʔɨ-, basketry fiber, probably squawbush, _Rhus trilobata_. M, NP, P, S, (C), K, (SP), U, H, T, Ca. (P-M-K, *sɨ(h)ɨpɨ, willow, squawbush).

*nabu, prickly pear, _Opuntia_ sp. NP, S, K, (SP), H, Ca, L, Cu. (P-C *nav t, prickly pear) (UAC #70, *nap cactus (prickly pear)).

*wata, probably seepweed, _Suaeda depressa_. M, NP, S, (SP), H.

*waʔa, juniper, _Juniperus_ spp. M, NP, S, (C), K, (SP), U, L, T.

*waʔi, Indian rice grass, _Oryzopsis hymenoides_. M, NP, S, K, (SP), U, H. (P-C *wavic, foxtail?)

*wiha, hemp, <u>Apocynum</u> spp. NP, S, (SP), U, T, L, Ca, Cu, Pa.

*woko-, pine, probably <u>Pinus ponderosa</u>. M, NP, P, S, (C), K, (SP), T, H, L, Ca, Cu, Sr. (P-C *wexet-, pine) (UAC #320a, *woko pine).

*yampa, Indian potato, <u>Perdiderdidia</u> spp. M, NP, S, (C), K, (SP), U, T.

<u>Animals</u>

*tabu-, cottontail, <u>Sylvilagus</u> spp. M, NP, P, S, (C), K, (SP), U, Ca, L, H, T. (UAC #334a, *tapu, rabbit, cottontail).

*tuku, bobcat, <u>Lynx rufus</u>, but also mountain lion as a compounded form (various). M, NP, P, S, (C), K, (SP), U, L, Ca, Cu, T, H. (P-C *tukut, wild-cat) (UAC #460, *tuku, wildcat).

*poni, skunk, <u>Mephitis mephitis</u>. M, NP, P, S, K, (SP), U, T, Sr. (P-M-K *po... skunk) (UAC #382, *poni, skunk).

*huna, badger, <u>Taxidea taxus</u>. M, NP, P, S, (C), K, (SP), U, L, Ca, Cu, Sr, T, H. (UAC #18, *huna, badger) (P-C *hunwət, badger)

*kawa, woodrat, <u>Neotoma lepida</u>. M, NP, P, S, (C), K, (SP), U, H, L, Cu, Ca. (P-M-K *ka(wa) woodrat) (P-C *qawala (?), rat) (UAC #340, *ka, *kawa, rat).

*taba, chipmunk, <u>Eutamias</u> spp. NP, P, K, (SP), T. (UAC #89, *tapa, chipmunk).

*wiko, buzzard, <u>Cathartes aura</u>. M, NP, P, S, K, (SP), U, T, Ga, H. (UAC #67, *witu, buzzard).

*muʔu *muhu, owl, probably horned owl, <u>Bobo virginianus</u>. M, NP, P, S, (C), (SP), U, H, T, L, Ca, Cu. (P-M-K *muhu-, owl) (P-C, muhuta, owl) (UAC #312, *muhu, owl).

*kodo-, crane (probably <u>Grus canadensis</u>). M, NP, S, (SP), L, Cu (?).

*kuk^{w}u-, burrowing owl, <u>Speotyto cunicularia</u>. NP, S, (SP), L, Ca, Pa.

*ata, *kata-, crow, <u>Corvus brachyryhynchos</u>. M, NP, S, (C), K, (SP), U, T, H. (Possibly P-C *ʔalwVt, crow) (UAC #111, *ʔat).

*cai-, blue bird, Sialia mexicana. M, P, S, (SP), L, Ca, Cu. (P-C *caʔic, blue bird sp.).

*waga-, frog, Rana spp. M, P, S, K, (SP), L, Ca, Cu, T. (P-M-K *wa...(ka)..., frog) (P-C *waxa, frog) (UAC #192, *waka, frog).

*maka-, horned toad, Phrynosoma spp. NP, S, (SP), U, H.

*ata^{n}ka-, grasshopper, family Acrididae. NP, P, S, (C), K, (SP), U, H?

*ani, ant, family Formicidae. NP, S, K, (SP), H, T, L, Ca, Cu. (P-C, *ʔanVt, ant) (UAC #4, *ʔane).

*poci, louse (Pediculus spp.) NP, P, S, K, (SP), U, H? (UAC #175, *tepu, *tepuc, "flea"?).

*mata-, tick (Dermacentor spp.) NP, S, K, (SP), U, L, Ca, Cu. (P-C, *mac-?, tick).

*piyagɨ, a grub worm M, S, K, (SP), H, T.

*woʔa-, a locust with larvae (M, NP, S, (C), K, (SP), Sr. (Sr form is for "grasshopper").

b. Set II. Set II includes forms that are found in languages of at least two of the Numic sub-branches, and also in at least one other northern Uto-Aztecan language. Semantically, they are all unitary simple lexemes, and structurally, stems or roots. They also seem to reflect regular sound correspondences, with the exceptions noted. In some cases, data for these are missing in one of the Numic sub-branches; thus, they may eventually qualify for Set I. In other cases, however, there seems to have been a change in one of the sub-branches, due either to extra-Numic borrowing or perhaps to innovation. The forms of Set II probably also reflect the Proto-Numic period, or some earlier time. Suggested Proto-Numic reconstructions, tentative referents and distributions for Set II are as follows:

*aca, tansy mustard, Descuriana sophia. M, NP, K, (SP), U, H, Ca.

*ici~*pici, a berry, either boxthorn, Lycium sp., or perhaps squawbush, Rhus trilobata. S, (C), K, (SP), U, T, L.

*pasi, chia, Salvia columbariae. M, K, (SP), U, L, Ca, Cu, T. (P-C *paşal, chia).

*tɨsi-, salt grass, Distichlis stricta Rydb. NP, S, T.

*siʔi, an onion, Allium sp. NP, (SP), H, T, Pa. (UAC #311, *siwi, onion).

*sana-, douglas fir? (Pseudotsuga menziesii). M, S, H.

*kana-, willow, Salix spp., but not including tree forms. (see *saga-, above). SP, U, T, H, Ca (UAC #461, *ka, *kan, willow tree).

*k^{w}ia, oak, Quercus sp., probably Q. Kellogii. K, (SP), U, L, Ca, Cu, Sr, H, T. (UAC #1, *kwi *kwini, acorn) (P-C *k^{w}inila, oak sp.).

*wiya, oak, Quercus sp. M, NP, P, K?, L, Ca, Cu, (UAC #2, *wi, acorn) (P-C *wiʔa, oak sp.).

*paka, cane, Phragmites communis. (SP), U, T, H, M, (C), Sr. (UAC #334, *paka, reed).

*mɨca-, hedgehog(?) cactus (Opuntia erinacea). S, (C), SP, L.

*yɨwi-, spruce? (Picea engelmannii). M, K, (SP), L, Ca, Cu. (P-C *yuyila, spruce).

Animals

*issa, coyote, Canis latrans. M, NP, S, P, T, H. (P-C *ʔiswət, wolf, aug. of coyote). (UAC #109, *ʔis, coyote).

*wocia, desert fox, Urocyon cinereoargenteus. M, NP, K, (SP), L?, Cu?, Ca? (P-C *qawe...icʔ, fox) (P-M-K, *...wohcV..., fox).

*mɨha, porcupine (Erethizon dorsatum). M, NP, H, (S, SP?). (UAC #329, *me, porcupine).

*mɨyɨ, gopher, Thamomys spp. M, K, (SP), H, L, Ca, Cu. (P-C, *m h ta, gopher). (P-M-K, *mɨjɨ, gopher) (UAC #202, *meye, gopher).

*pa-takadi, racoon (Procyon lotor). M, NP, SP, T. (see also Set III).

*k^winna, eagle, Aquila chrysaetos. M, NP, S (UAC #146b, *k^wi, eagle, hawk, etc.)

*k^wanna, eagle, perhaps the same (see discussion, below). K, (SP), U, H, Sr. (UAC 146a, *k^wa, eagle, etc.)

*wasa, heron, blue? (Ardea herodias). M, NP, P, T, L. (UAC #146a, *k^wa, eagle, revised.[24]

*kaka-, *takaka, quail (Lophortyx spp.) M, K, (SP), U, L, Ca, Cu, Sr. (P-C, *qaxal, quail) (UAC #332, *kaka (?), *takaka, *kakata, perhaps imitative.

*howi, dove, Zenadidura macroura. M, NP, P, S, K, (SP), T, H, (inter-Numic borrowing indicated) (UAC #138, *howi, dove).

*aŋa, scrub or pinyon jay (Aphelocoma spp.) NP, SP, H.

*passi, bald eagle (Haliaeetus leucocephalus). NP, SP, L.

*kini, chicken hawk (Bruteo spp.) M, S, L, Sr, H.

*saiya,~*sakiya, mudhen or coot (Fulica americana) M, NP, S, K (?), T, L.

*puʔica (?), mouse, Peromyscus spp. M, NP, P, K, (SP), U, T, H. irregular. (P-M-K, *puCicca, mouse) (UAC #292, irregular, mouse).

*koyo, tortoise and/or turtle, Gopherus agassizi. NP, T, Sr, Pa (UAC #446, *ko, turtle).

*aya, tortoise and/or turtle. M, P, SP, U, Ca, L, Cu. (P-C, *ʔayily, turtle) (UAC #445, *ʔay, turtle).

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[24]Miller's (1967:31) UAC #146a is as follows: "eagle *k^wa. SP k^wana-; Tb waaʔa-l 'hawk'; waasa-l 'grey crane'; Ls k^wa-la 'blue heron'; Sr k^waaʔ-t 'condor'; Hp k^wa:hɨ "American eagle'; k^wa.yo 'small eagle'; Pg baʔag; NT bagai; Tr waco 'heron'; Cr kuaʔɨraʔabe (sg.), k^waʔɨraʔabe-te (pl.); k^waasu (sg.), k^waasuu (p.) 'heron'; Hch k^waazuu 'heron'. Relationships are not clear, but we can suggest that Tb 'grey crane' Tr 'heron' and Cr 'heron' and Hch 'heron' may be part of a second set, related to Proto-Numic *wasa, heron.

*wɨpo *mɨpo, mosquito (*Culex* spp.) NP, S, (C), H.

c. *Set III*. Set III consists of forms that are strongly reflected in Numic only, being found in at least one language of each of the three sub-branches. We do not, however, have evidence of their occurrence in any other northern Uto-Aztecan language. For the most part, they display regular and predictable sound correspondences. Structurally, some are complex as opposed to simple stems. The forms of Set III may represent the Proto-Numic period, or perhaps an early post divergence period prior to general Numic expansion. They will be reconstructed tentatively as Proto-Numic, although due to the closeness of the correspondences, such reconstructions should not be significantly different for the post divergence period. The forms are as follows (see Tables 2 and 3 for distributions):

Plants

*tonca-, Indian balsam, *Lomatium dissectum* var. *multifidum*.

*tuʔu, broom rape, probably *Orobanche fasciculatta* but perhaps generic.

*tuna^{n}-, mountain mahogany, *Cercocarpus* spp.

*kana, bitterroot, *Lewisia redivivi*.

*kanɨ^{n}-, hopsage, *Grayia spinosa*.

*kɨnka, a large onion, probably *Allium acuminatum*.

*huʔu, a boxthorn, probably *Lycium andersonii*.

*ciʔa^{n}-, wild rose, *Rosa* spp.

*saŋ^{w}a-, big sagebrush, *Artemesia tridentata*. (Western and Southern Numic only; Central Numic differs).

*sɨna-, aspen, *Populus tremuloides*.

$*mono^{n}$-, a grass, possibly dropseed, Sporobolus spp. or foxtail (Hordeum jubatum ?)

$*wi?a^{n}$-, buffalo berry, Shepherdia argenta.

*mu?a-, an onion, probably Allium pleianthum.

Animals

*tɨ?i, deer, Oceocoilus hemionus.

*kucu, bison, Bison bison (see discussion, below).

*kammɨ, jackrabbit, Lepus californicus, also Lepus spp.

*wani-, red fox, Vulpes fulva.

*sadi-, dog, Canis sp.

*sɨssɨka, weasel, Mestela frenata.

*kɨmpa, ground squirrel, Spermophilus townsendii.

*wo?i, ground squirrel, Spermophilus lateralis.

*yɨpa, fox, Vulpes macrotis (irregular).

*cipi, a ground squirrel.

*nanka-, marsh hawk, Circus cyaneus.

*nagɨ-, goose, Branta canadensis.

*hito, meadow lark, Sturnella neglecta.

*suku, robbin, Turdus migratorius.

*cogo- ?, a blue jay (irregular).

*pantɨci, a water bird, probably ouzel (Cinclus mexicanus).

*koko, bull snake (Pituophis spp.).

*kɨ?a, locust.

*pina, (?), yellowjacket (Vespa diabolica).

Also, as a special sub-set within Set III, five forms found in all Numic sub-branches as compounds involving the stem water *pa-, and some other analyzable stem, usually another proto-generic: elk as "water-deer," *pa-tɨʔi, water snake as "water-rattlesnake," *pa-to-gok^{w}a (see specifics, below), various junipers and other evergreens as "water juniper," *pa-waʔa-, beaver, possibly as "water dog," *pacuku and mint as "water smell," *pa-k^{w}anna. Of these five, the last two, beaver and mint, seem the most legitimate. The others may be cases of convergences given the common semantic principles. The status of these with reference to Proto-Numic will be further discussed below.

d. Set IV. Set IV includes the remaining forms in Tables 2 and 3, all weakly reflected. Some of these are found in two or more adjacent Numic languages, and/or in a single Numic language and an adjacent non-Numic northern Uto-Aztecan language. As such, many of these may be intra-Numic and extra-Numic borrowings. However, since some of the distributions recorded may reflect only weaknesses in the data, some of these forms may also be Proto-Numic. For the present, however, their status must remain uncertain. The forms of Set IV, with referents and distributions, are discussed separately in Appendix B.

e. Discussion. Although the status and identification of each of these forms is probably worth examining in some detail, we will here limit ourselves to a discussion of only a few that either pose special problems, or illustrate some of the difficulties inherent in proto-semantic research. Of particular interest in Set I are the forms *sɨʔɨ-, "basketry fiber," probably Rhus trilobata;*tɨmaya, "tobacco mix," probably manzanita (Actostaphylos spp.); *wiha, "cordage fiber," probably *Apocynum*; and *wata, probably seepweed (*Suaeda depressa* Wats.). Each of these illustrate the necessity of considering various lines of evidence, and particularly cultural data as to use, when reconstructing proto-referents.

As will be noted by referring to the table of plant correspondences (Table 2, no. 42), reflected forms of the proto-generic *sɨʔɨ- are associated with two quite distinct modern genera by present-day Numic speakers; i.e., with willow (*Salix* spp.) in Mono, Northern Paiute, Panamint and Shoshoni (including Comanche) and with squawbush (*Rhus trilobata*) in Kawaiisu and Ute. A third generic association is possible if we consider J. P. Harrington's comments on the Chemehuevi cognate. Harrington (Hill 1969:33) notes that Chemehuevi [səhəvə̣] refers to "what [they] weave baskets of; resembles wild grape vine. This is the stuff, the material; but the vine is [səhəvimpə]." This description seems to fit neither *Salix* nor *Rhus*, and may refer to virgin's bower (*Clematis* spp.) or some other "vine-like" form.

Although we might legitimately assign the referent "willow" to Proto-Numic *sɨʔɨ-, based on distributional evidence (*sɨʔɨ- is reflected as willow in four of the six Numic languages), if we consider additional correspondences, this equation seems less valid. Hopi, Tübatulabal and Cahuilla, all Uto-Aztecan languages in close proximity to languages of the Numic branch, also have apparent cognates for Proto-Numic *sɨʔɨ-. The Hopi form /sɨ:vi/ refers to squawbush (*Rhus trilobata* Nutt.) (Voegelin and Voegelin 1964; Whiting

1939) as does Cahuilla /silit/ (Barrows 1900; Bright 1967). The Tubatulabal form /sɨ-l/, however, is defined by Voegelin (1958) only as "weft material."

Further confusion arises when we note that both willow (Salix spp.) and squawbush (Rhus trilobata Nutt.) appear to have other Numic and general Uto-Aztecan terminological associations. In Southern Paiute, [iʔíši] is used to designate squawbush berry, [sɨʔɨ́bi] being reserved for the plant and its stems. In Gosiute Shoshoni the apparent cognate /ittsɔ-ppɔh/ is also squawbush berry (W. R. Miller, personal communication, 1971) while [sɨ́hɨbi] is willow. In Luiseño, /ʔi.či-s/ is defined as "an evergreen shrub with edible berries" by Bright (1968:8), a description that fits squawbush, but also some of its near relatives. In Tübatulabal, an apparent cognate /pi.ʔiš-t/ is identified as Lycium sp. by Voegelin (1958), also a plant with small edible berries. The reconstruction of a Proto-Numic and perhaps Proto-(northern) Uto-Aztecan form *pici-~*ʔici- seems warranted (see also Set II, above).

Forms for willow as Salix spp. are also found in other Uto-Aztecan languages. Willow is [kanábɨ] in Southern Paiute, /qahá:vi/ in Hopi and /qáanki-s/ ("desert willow" Chilopsis linearis Cav.) in Cahuilla. The Tubatulabal form /haa-l/, willow, is also a cognate. Miller (1967:63) suggests a proto-Uto-Aztecan (northern?) form *ka,*kan to cover these correspondences (see Proto-Numic *kana-, "willow" in Set II).

The various plants reflected in Proto-Numic *sɨʔɨ- have one primary aspect in common; i.e., they comprise a single unit as to use. All of these referents are connected in some way to basketry manufacture. In Mono, Northern Paiute, Panamint and Shoshoni, willow is the primary basketry fiber [Coville (1892:358) also refers to the use of squawbush as well as willow in Panamint, but provides no terminological associations.] In Ute (northern), Southern Paiute, Kawaiisu, Hopi and Cahuilla, squawbush is more important. The Chemehuevi and Tübatulabal definitions cited also refer to basketry. In view of the evidence, we can safely assign at least the meaning "basketry fiber" to Proto-Numic *sɨʔɨ-. The Proto-Numic form *pici~*ʔici, on the other hand, quite clearly refers to a berry, either of squawbush or some related form. Proto-Numic *kana- may be reserved for willow.

Can we say anything further as to a possible plant referent for Proto-Numic *sɨʔɨ-? Given the evidence, probably only if we consider a specific culture historical hypothesis. If Lamb's (1958b) suggestion of Proto-Numic origins is correct, we may be able to infer from the evidence just presented that the common basketry fiber of Proto-Numic or early Numic times was probably squawbush and not willow. This interpretation follows from the distribution of these two plant forms and also from ethnographic analogy. Most of the Indian groups in southern California (Uto-Aztecan and others) favor this plant for basketry. The geographic distribution of squawbush is also concentrated in these southern areas as well as in the eastern Great Basin, where it is also the favored basketry fiber source. It is sparse to absent in most of the areas where *sɨʔɨ- reflects willow. We can speculate from this evidence that in Proto-Numic or at least early Numic times, *sɨʔɨ- as squawbush was primary, and that with the geographic dispersion of Numic and the subsequent movement of Western and Central Numic into areas lacking squawbush, *sɨʔɨ- acquired the new association, "willow."

Two other forms in Set I are of interest in that they provide yet additional examples of the importance of *use* as a semantic principle in Numic and perhaps in Proto-Numic as well. These forms are *tɨmaya, tentatively reconstructed as Proto-Numic for "tobacco mix," probably manzanita (*Arctostaphylos* sp.) and *wiha, "cordage fiber," probably hemp (*Apocynum* spp.).

Reflexes of *tɨmaya are recorded variously in Northern Paiute, Shoshoni, Comanche, Southern Paiute and Ute (see Table 2, no. 1), as well as in Tübatulabal (Voegelin 1958). They are primarily associated with manzanita (*Arctostaphylos* spp.) (see identifications for NP, SP, U). There are, however, three other names associated with this genus in northern Uto-Aztecan. One is found in Western Numic: Mono /ʔahpohsowa/ and Northern Paiute /aposogʷa/. A second occurs in Central and Southern Numic: Shoshoni *a-ra-dum-pib* (*Ceanothus* sp., according to Chamberlin 1905), Kawaiisu [ha:dʌbi:-βɨ] and Southern Paiute [adə́dampibɨ]. And the third term is found in Tubabulabal as /kɨ.na-l/, manzanita. It is apparently the cognate of Proto-Cupan *kəlVl, manzanita (Bright and Hill 1967).

If we look at the use of manzanita in the various historically known Numic groups, we find that it was most frequently employed as a "mix" to cut the strength of native smoking tobacco (<u>Nicotiana attenuata</u> Torr.). Comanche [ti-məyhɔ], identified as smooth sumac (<u>Rhus glabra</u>) (Carlson and Jones 1939), Tübatulabal /tu.mayut/, identified as <u>Fremontia californica</u> (Voegelin 1958) and Gosiute Shoshoni <u>ti-mai-hya</u>, identified as bilberry (<u>Vaccinium caespitosum</u> Michx) by Chamberlin (1905:384) also serve this same function. The compound form [koʔa tɨ̇ʔmananampɨ], recorded from some Southern Paiute informants for manzanita is more literally "what's mixed with tobacco." The stem *tɨmaya, probably from the verb "to mix," thus seems to refer to this practice. Paralleling our discussion of a proto-referent for *sɨʔɨ-, "basketry fiber" as specifically squawbush, we can say that on the basis of the distributional evidence, *tɨmaya as "tobacco mix" probably referred to manzanita or some other manzanita-like shrub (perhaps <u>Fremontia</u>), in Proto-Numic times. Various species of manzanita occur widely in mountain environments from the Sierra to the Rockies chain. The genus is rare, however, in the central Great Basin. In these areas, as for example in Gosiute Shoshoni territory, other like plants serve the function of "tobacco mix," and have thus come to be associated with the form *tɨmaya.

Given the presence of a second stem for manzanita in Tübatulabal and Takic, we must either postulate two proto-forms associated with the genus <u>Arctostaphylos</u>, suggest <u>Fremontia</u> or some other like form as a proto-referent, or conclude that *tɨmaya is not a true proto-generic. It is difficult to decide between these alternatives at this point. In that the etymology of the form is somewhat transparent, we might suggest the third alternative. However, the genus Arctostaphylos is very important in California, and the focus of considerable native activity especially in food gathering (various species produce edible berries). This use was unimportant to historic Numic peoples, although we are uncertain at this point as to the cause; i.e., disinterest, loss of the idea or inedible species. Until further investigations are made, the status of *tɨmaya as a proto-generic should remain in question.

Similar circumstances also seem to obtain for *wiha, the Proto-Numic form for "string fiber," probably specifically hemp (Apocynum cannabinum). The reflexes of *wiha in the various Numic languages describe either hemp or milkweed (Asclepias speciosa) both of which produce fibers that can be made into cordage. In Luiseño, cognate /wi.ča/ is hemp, while in Cahuilla /wicha/ is milkweed. Barrows (1900) also records a form wish in Cahuilla, applied to native cane or reed (Phragmites communis), also used for string and cordage. Hill (1967) notes a Cupeño form /wi/, also probably a cognate, applied to a species of willow used to make bow strings.

In several Numic areas, notably at Owyhee, also in the Gosiute Shoshoni area, and in certain sections of Northern Paiute country, the form *wana is also associated with hemp, milkweed and other fiber producing plants used in the manufacture of cordage, string, netting, etc. In some areas, this form is defined as "net," while in others it has a broader meaning "string." The application of this form as a plant name also illustrates the merging of ideas surrounding use with the specific plants involved. In cases where use is so well correlated with plant generics, it is difficult to tell with certainty whether the "original" meaning of the form was generic or referred to the item manufactured.

An additional example illustrating the necessity of considering various data from a broader context in proto-semantic reconstruction is provided by the form *wata and its interplay with *koo- (see Set I) and a weakly reflected form variously recorded as [ɨapɨ] or [üyüp] (see Set IV). Forms derived from *wata are identified as the seeds of either seepweed (Suaeda depressa) or lamb's quarter (Chenopodium album) by most Numic informants (see Table 2, no. 5). The forms for *koo- usually refer to the seeds of goosefoot, also a chenopod (Chenopodium Fremontii). [üap] (Steward 1938:23), [üyup] (Kelly 1932:98), [i-u-pi] (Chamberlin 1909:388) or [ɨapɨ] (see Owyhee Shoshoni, Chapter III), recorded for various Nevada, Idaho and California Shoshoni and Northern Paiute groups, also refers to a chenopod, usually lamb's quarter (C. album). All of these plants are similar in that they produce an edible black seed. The parent plants do show morphological differences, however.

From these various data, we might thus postulate three Proto-Numic generics: *wata, as either seepweed or lamb's quarter, or both; *koo- as goosefoot (also a chenopod, as is lamb's quarter), and perhaps *ɨa- also a chenopod and perhaps even lamb's quarter. We would thus have at least two terms referring to chenopods, and possibly three.

If we examine the cultural data reported for the use of lamb's quarter and for the chenopods generally, we find that these plants were those most frequently sown broadcast by the central Nevada Shoshoni (Steward 1938:23). Given this indication, it seems probable that the form [ɨapɨ] represents a Shoshoni innovation related to this practice. The form itself probably derives from the Proto-Numic stem *ɨa-~*ɨʔa, not a plant generic but a proto-form of the verb "to plant" [see also Proto-Uto-Aztecan *ʔe, or *ʔei, "to plant" (Miller 1967:50)].

With *ɨa- in all probability eliminated as a proto-generic for lamb's quarter,[25] we must thus further consider its identification with the form *wata. Two alternative explanations emerge from the data: 1) *wata was a proto-generic for the botanical genus Suaeda or seepweed, and *koo- referring to goosefoot only, or perhaps some of its closely related forms.

Three lines of evidence favor the first solution; i.e. *wata as only Suaeda. First, the presence of an apparent Hopi cognate for seepweed /la:tci/ (Whiting 1939:74). There may also be a Luiseño cognate in the form /wacxava-t/, identified by Bright (1968:48) merely as "a type of plant."

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[25]It seems unlikely that this particular form with its transparent etymology and so many other applications is a true proto-generic.

Second, Munz and Keck (1963:372) indicate that lamb's quarter is a naturalized species from Europe [see Hopi characterization of this species as a "weed" (Whiting 1939)]. Third, referents to *wata as seepweed are more common in modern Numic than those to lamb's quarter. However, the possibility of solution two (*wata as both Suaeda and lamb's quarter) cannot be fully ruled out for two reasons: 1) the apparent close identity between at least some members of the genera Suaeda and Chenopodium, noted by Munz and Keck (1963:384) in the original classification of at least one seepweed (S. futicosa) as a chenopod (C. futicosa) by none other than Linnaeus; and 2) by indications that lamb's quarter, if naturalized from Europe, either spread very rapidly throughout the Great Basin, and/or has been present long enough to have become associated with the reflected forms of *wata in such widely separated areas as Owens Valley and Surprise Valley, California and Kaibab, Arizona. Since the focus of meaning for *wata is on seed, extensions seem logical. Although we have here identified *wata as seepweed, the possibility of its broader meaning should be kept in mind.

Three pairs of forms in Set II are also worth special note as they seem to reflect the presence of either competing proto-forms or dual native generics within a single modern genus. These are the forms *k^wia and/or *wiya, both oak(s) (Quercus spp.), *k^winna and/or *k^wanna, both eagle(s) (Aquilia spp.) and *ko and/or *ay, both turtle (or perhaps better, tortoise). Miller (1967) also notes the presence of all these forms in his compilation of cognate sets for Uto-

Aztecan, although his reconstructions, based on evidences from languages not considered here, differ slightly. If his analysis based on wider distributional patterns is correct, then each of these pairs is reflected in one or more Numic sub-branches.

The various terms for oak in Numic are given in Table 2 (no. 57). Referring to these, we see that Mono, Northern Paiute and Panamint reflect Proto-Numic *wiya, while Shoshoni, Southern Paiute and Ute reflect Proto-Numic *k^wia. From such evidence, we might be led to postulate one proto-stem from which the two derived. However, if we consider additional distributions, this seems less likely. According to Zigmond (1971), Kawaiisu apparently has both stems (Table 2, no. 57). Bright and Hill (1967) also reconstruct two stems for oaks in Proto-Cupan: *k^winila and *wiʔa-. Hopi reflects Miller's (1967) Uto-Aztecan stem *k^wi ~ *k^wini, with the form /k^wiŋvi/. Tubatulabal may do the same with /wini-yaa-l/ "acorn, black oak."[26] Overall phonological similarities in the two stems may indicate that at some very early period in Uto-Aztecan history there was a single stem. However, by Proto-Numic times, there definitely seem to have been two.

Parallel conditions seem to occur with the terms for eagle, although the situation needs further clarification.

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[26]According to Voegelin (1958), Tubatulabal does not have initial /k^w/, but rather reflects /w/. The medial /n/ in this form makes it likely that it corresponds to Proto-Numic *k^wiya rather than *wiya, as the Proto-Cupan form for the former also contains a medial /n/; e.g., *k^winila.

Mono, Northern Paiute and Shoshoni reflect Proto-Numic *k^winna, while Kawaiisu, (Southern Paiute) and Ute reflect Proto-Numic *k^wanna. Hopi also shows *k^wa, with its form /k^wa:hɨ/ "American eagle" (Voegelin and Voegelin 1957). However, Tubatulabal and the various Takic languages evidence yet a third stem reconstructed by Bright and Hill (1967) for Proto-Cupan as *ʔaswət [Tubatulabal is /ʔaasawə-t/ according to Voegelin (1958)]. Miller (1967:31) suggests that this latter stem may be an augmentative of either "pet," or perhaps some other bird name (see UAC #136, 147).

If Miller's (1967) view of the independence of his stems *k^wa amd *k^wi is correct as he states it, then there has been considerable change in referents for these forms in the modern Uto-Aztecan languages. Each of his sets (UAC #146a, 146b) groups together terms not only for eagles, but also for hawks, herons, cranes, etc. Extensions to hawks may be valid as we have noted earlier (Chapter III), in that there is a tendency for most modern Numic groups to merge these two classes, often characterizing hawks as "little eagles." However, we have preferred to reconstruct a separate proto-Numic stem for heron *wasa (Set II). This situation seems particularly complex, and deserves further attention. However, we can do little more than note the complexities until additional data are gathered in other languages.

Lastly for Set II, the presence of two stems for turtle (or perhaps better tortoise) also deserves further comment. Miller (1967:61) lists *ʔay, reflected in Southern Paiute as [ʔaya-s], Cahuilla as [ʔayil] and Huichol as

[ʔaaye], and *ko, reflected in Tubatulabal as /kooyoo-t/, Serrano as /qopɵ-t/ and Papago as [komkcud]. Our Numic comparative data shows *ko only in Northern Paiute /koʔya/, with Mono, Panamint, Southern Paiute and Ute all reflecting *ʔay. Bright and Hill (1967) also reconstruct *ayily as Proto-Cupan for turtle. The rather uneven or mixed distribution of these two forms seems to indicate that both were present in the area of Proto-Numic divergence, either as two stems for the same biological form, or perhaps stems for two separate biological forms (tortoise and turtle?).

In Set III, special attention should be drawn to the suggested reconstruction of a proto-Numic, or at least early Numic generic for bison, *kucu. This form is reflected in three Numic languages of separate branches, but all are northern; i.e., Northern Paiute, Shoshoni (including (Comanche) and Ute (including Southern Paiute). It is not recorded as either present or absent for Mono, Panamint or Kawaiisu.

Questions as to the aboriginal range of bison in western North America have caused considerable debate over the years. Some authors (Roe 1951; Haines 1940) decline to extend the range of bison into the Great Basin area. Others such as Allan (1877), Hornaday (1887), Garretson (1938) and Seton (1928:646-7) bring together considerable evidence to the contrary. Riddell (1952) and Downs (1963:125-6) have proposed on the basis of archaeological and ethnohistoric evidence, respectively, that bison were present as far west as the Honey Lake area of northeastern California until about 1830. Jennings (1957) reports only scattered remains in Danger and Juke Box caves in western Utah. Archaeological evidence of the presence of bison in the upper levels of Newark Cave, in White Pine County, east-central Nevada are not conclusive. Fowler (1968) states that the few remains recovered may represent modern cow (Bos sp.), although he does not rule out their identification as bison (Bison bison). Taylor (1954:60-61) also notes that bison remains were found at the Garrison Site, near Baker, on the central Nevada-Utah border, but does not further discuss their nature or provenience. The Garrison Site is a pueblo of Fremont affiliation, dating somewhere between 900-1200 A.D.

Our special interest in the question of the presence of bison in some early Numic or Proto-Numic environment stems in part from the correspondences noted, but also from the suggestion by Lamb (1958a) that bison may have provided the attraction for Numic dispersion near A.D. 1,000. If Seton (1928) and others are correct, and bison were present at least in small numbers as far south as central Nevada, Lamb could also be correct, and likewise the suggested Proto-Numic generic *kucu as bison. However, given the present distributional evidence for the form, it might also be an early intra-Numic borrowing, perhaps having occurred either during the period prior to the internal divergence of each of the three Numic sub-branches [ca. 1,000-500 years ago, according to Miller (1966) and Goss (1962)] or in even more recent times. Several other forms in Set III, tentatively reconstructed also as Proto-Numic or early Numic, may follow a similar pattern, as we have already suggested.

Also, a special sub-set of five forms within Set III deserves further comment. These are compounds involving the stem for water *pa- and some other analyzable stem, usually another proto-generic. Included are elk as "water-deer," water snake as "water-(rattle)snake," various evergreens identified as "water-junipers," perhaps beaver as "water-dog" and mint as "water-smell." Each of these forms is found in at least one language of each of the Numic sub-branches, functioning taxonomically as generics (see Specifics, below). In addition, the form "mustache fish" is also found in all as the name for catfish.

The status of these forms as Proto-Numic generics is difficult to postulate with certainty. But based on distributional evidence, they should perhaps be so viewed. However, they may also result from the application of one of our common set of semantic principles (habitat) at some later period. Similar conditions are probably also responsible for the convergence of names for catfish as "mustache fish." The American English common name as "cat fish" seems to arise from the observation of the same morphological trait; i.e. its "whiskers." Observation of the same trait has also led to a partial semantic convergence in the various Numic names for the plant cleome. In Northern Paiute it is called /puku s.ina/, "horse's urine," and in Shoshoni and Southern Paiute, /an.ak^{w}annapɨ/ and /sook^{w}annampɨ/, "armpit odor." The popular American name is "stinkweed."

With the possible exception of the form for beaver, *pa-cuku, which seems least likely to reflect convergence in that the modern Numic forms for "dog" are probably not derived from Proto-Uto-Aztecan *cu (UAC #137), the status of these forms as Proto-Numic generics remains in question. Present-day Numic speakers in widely separated areas still generate new plant names by using the modifier *pa-. However, since we cannot rule them out as legitimate proto-generics either, we will leave them as given in Set III while making note of the problem as stated.

Comments on the members of Set IV are given with the cognate sets in Appendix B.

2. Specifics

Lexemes labeling specifics occur in all Numic schemes, but with far less frequency than generics. Following Conklin (1962), Berlin (1971) and our own previous treatment (Chapter III), we shall consider as modern specifics only those forms that: 1) clearly function as taxonomic subordinates to generics; and 2) contain a generic, plus an attributive or modifier of the type that indicates this status. By definition, specifics are also "composite lexemes" (Conklin 1962: 122), functioning in this case as true binomials.

As we have noted previously (Chapter III), specifics in present-day Numic languages are less stable than generics. They comprise a productive and sometimes idiosyncratic class, with forms often varying from informant to informant within a single language, sub-cultural area or speech community. A degree of instability also extends to the taxonomic positioning of some specifics, with individuals being uncertain as to whether to handle some forms as taxonomic subordinates to generics, or as their taxonomic equivalents; i.e. as other generics. In this latter case, informants feel that the modifiers contained in some of these forms call attention to plant and animal similarities rather than to sub-groupings.

Of the various composite lexemes that might be considered specifics according to semantic and taxonomic criteria, those that pose the least difficulty in definition are plant and animal names of the shape "generic plus color or size attributive." Informants agree that these two characteristics most frequently indicate a class inclusion relationship for the modified forms; i.e., [pía?akɨ] "big sunflower" is a "kind of" [ákɨ] sunflower to Shoshonis, not its taxonomic equal, as is [túu pamógo], "black frog" a "kind of" [pamógo] frog to Northern Paiutes. Examples of specifics using color and size attributives are found in all taxonomies, primarily for plant and animal generics of some cultural importance and/or ecological prominence (see various figures and discussion, Chapter III). Specifics for Owyhee Shoshoni sunflowers and currants (Figure 10) and Northern Paiute frogs (Figure 7) illustrate the elaborated use of these principles.

In addition to forms containing a generic plus a color or size attributive, there are also several other composite lexemes that informants occasionally consider as specifics. Included are forms of the shape "generic plus a modifier indicating habitat," such as "mountain," "desert," "sunny (hillside)," and, less frequently, "water." Examples include: [káiba sawábi], "mountain sage," (dwarfed varieties of big sagebrush, Artemesia tridentata) and [tabá sigúpi] "sun rabbitbrush" (Chrysothamnus viscidiflorus) in Northern Paiute; [tóya sɨ́hɨbi] "mountain willow" (Salix spp.) in Shoshoni; and [yu?á ciŋá] "desert thistle" (Circium sp.) in Southern Paiute. However, forms containing habitat modifiers may also function as generics in taxonomic schemes, as informants note that they can call attention to similarities between forms rather than to subordinating principles. This is particularly the case with those forms designated "water (generic)" as noted previously (see Generics, above). The use of "water" as a modifier is a very common device in all Numic languages for forming new generics.

Those lexemes containing an animal modifier, such as for example [sɨná upípɨ] "coyote's lycium," in Southern Paiute or [wɨ́da?a pógombi] "bear's currant" in Shoshoni also function in this way. Reference to coyote in plant names can be equated with the common American English practice of designating a form as "false;" i.e., as in "false flax" (Camelia spp.) vs. "flax" (Linum spp.), and others. Reference to bear frequently implies that the form in question is very "strong," either in taste or some other property.[27] Since the taxonomic treatment of the "animal" forms is not always consistent,

[27]"Bear's berry" is said to have been created by bear with a strong and bitter taste so that "people would not eat it and he would have it all to himself." "Bear's hemp" is so designated because its fibers are larger and stronger.

however, a combination of taxonomic and linguistic criteria with comparisons must be used to define such forms as specifics (see Berlin, Breedlove and Raven n.d., and Berlin 1972 for attempts to define them solely by semantic criteria).

If we compare specifics from the Numic taxonomies elicited, as well as from published and unpublished sources (see Generics, above), we find that very few forms are actually held in common in the various schemes in spite of the presence of like semantic principles leading to their formation; i.e., the use of color, size, etc., attributives. Those specifics that do occur as comparable forms in two or more Numic sub-branches and/or in one or more Numic sub-branch and one or more other northern Uto-Aztecan language, are given in Table 5. Of these, only the forms for snowshoe hare as "white (jack)rabbit," *tosa-kammɨ, rattlesnake perhaps as "rock snake," *to-kog^{w}a and gopher snake/water snake as *pasi-ko (etymology of *pasi unknown) show sufficient phonological similarities and distributional patterns to suggest proto-Numic reconstruction. Specifics for two colors of willows, two rabbitbrushes, one sunflower and perhaps wolf and mountain lion (as augmentatives of coyote and wildcat) evidence broader northern Uto-Aztecan distributions as semantic cognates.

The form for rattlesnake, and, by extension the form for gopher snake/water snake, is included here primarily because of an etymology suggested by Sapir (1913:397). In his article comparing Southern Paiute and Nahuatl (and also other Uto-Aztecan languages), Sapir suggests that Proto-Numic

Table 5: Numic Correspondences for Specifics

Plants	Mono	No. Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	So. Paiute	Ute
"ashen sunflower"		kusi akɨ		kusiʔakɨ				
"red willow"		aca sɨɨbi					aŋkasɨʔɨbimpɨ (birch)	
"ashen willow"		kusi sɨɨbi		kusi sɨhɨbi				
"grey rabbit-brush"		izi sigupi					isi sɨkumpɨ	
"sun rabbit-brush"		taba sigupi					taba sɨkumpɨ	
"mountain sage"		kaibɨ sawabi					kaibɨ san^{w}abi	
"sun sego"				tabisigopɨ			tabisigo	
Animals								
rattlesnake	toqohq^{w}a	togog^{w}a	toŋɣwa	togoʔa		togɔwa	togoabɨ	togoʔev
snake sp.	pahsiqohq^{w}a gopher sn. pasogo water sn.	pahoobɨ bull sn.	pasugu snake	pasinkoko water sn.			pasigo water sn.	pasigok grey sn.
snowshoe rabbit	tohsahkah-mɨ	tohakam.ɨ		tosa kammɨ			toha kamɨ	

*to-kog^{w}a may reflect Proto-Uto-Aztecan *to, "rock" [Proto-Numic *tɨ-], plus Proto-Uto-Aztecan *ko, or *kowa, "snake," or "snake species," thus being literally "rock-snake." Proto-Numic *pasi-ko, gopher snake/water snake may follow a similar pattern, thus being derived from Proto-Uto-Aztecan or Proto-Numic *pasi, of unknown etymology, and Proto-Uto-Aztecan *ko~*kowa, "snake," or "snake sp." However, we should also note in this case that both Proto-Numic *to-kog^{w}a and *pasi-ko may have achieved the status of generics prior to the internal divergence of Numic, as *ko~*kowa seems to have been well on the way to developing intermediate status at this early period (see Intermediates, below).

The apparent lack of uniformity in specifics in the various languages under consideration may be due to several factors. Among them are: 1) the apparent cultural and biophysical dominance of generics, perhaps leading to a peculiar historical stability of these forms; 2) the continued productiveness of this class based on a common set of semantic principles for making such distinctions; 3) various environmental factors affecting more limited distributions for potential specific candidates, such as is seen in the modern equivalents of biological species; and, perhaps even 4) the absence of sufficiently detailed studies to provide proper comparisons.

3. Intermediates

As noted in our discussion of Berlin's (1972) scheme above, there is nothing in the Numic data to suggest the temporal priority of "major life forms" over "intermediates."

However, since many of the latter seem to originate in the generalization of generics, as Berlin predicts, we will discuss them at this time.

Intermediates are marked in all Numic schemes with varying frequency. They are often correlated with ecologically sensitive categories, or ones in keeping with environmental peculiarities in a given region (see, for example, Chemehuevi "thorny plants," Southern Paiute "sunflowers," etc., Chapter III). Most of the lexemes labeling these distinctions have their origin in generic forms, as suggested by Berlin (1971). However, the particular generic that so serves may not be the same throughout the region (see "frogs," "ducks," Figures 7, 13, 18), or even within a single language area (compare Chemehuevi and Cedar City "ants," "flies," Figures 18, 20). Intermediates are thus particularly reflective of cultural, ecological and linguistic independencies.

What indications do we have for the development of intermediates by Proto-Numic times? Of the various categories marked in the schemes discussed, only seven appear to share cognate terminology (see Table 6). These include *sibu- "rabbitbrush/desert brush" for plants, *tuku- "wildcat/felines," *muhu- "horned owl/owls," *kog^{w}a ~ *to-kog^{w}a, "snake/rattlesnake," *soʔa-, "spiders," *anɨ "ants," and *muhi "flies." Several others are common to two of the three Numic sub-branches (see Table 6). The number of forms common to insect groupings may suggest an inherent tendency to generalize rather than particularize these units based on natural

Table 6: Numic Correspondences for Intermediates

	Mono	No. Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	So. Paiute	Ute
Plants								
desert brush *sibu-ⁿ		sigupi desert brush		sibapi brush			sɨkumpɨ desert brush	
Animals								
cats *tuku-		tuhu?u		tukuʔu			tukuci	
owls *muhu-		muhɪ?u		muʔumbi			muupɨci	
snakes *ko~*kowa	pasogo gopher sn. kololki king sn. (loan?)	pahoobɨ	pasugu	pasinkoko koko blow sn.		kɔɔ king sn.	pasigo kogompɨci bull sn.	pasigok kogwɔ bull sn.
spiders *soʔa-	coʔahpeʔ	soada		wana so?aci			hokosoʔavi (Chemehuevi)	
ants *ani		ani		ani			anabi (not intermediate)	
flies *muhi	muuipi	muibi	muibiya	animui		mu:pizɨ	muupici	muwav

observations and their relative unimportance culturally. The same may be said for the various categories labeled as "weeds" in all schemes (see Figures 6, 12, 17, 21).

a. Plant Intermediates. Comparative data on plant intermediates yields only one that is widely distributed in Numic. This is a grouping of several small desert brush types under the term for the generic rabbitbrush, *sibu- (probably originally Chrysothamnus spp., but perhaps more inclusive). In all Numic areas, this form is used in the inclusive sense to bring together various short, frequently yellow-flowering brush species, particularly those of the genera Chrysothamnus, Tetrademia, Solidago, Gutierrezia and Happlopapus. Occasionally, small sages are also included, depending on area (see Chapter III). The use of *sibu- as an intermediate has also been recognized by other investigators. Train, Hendricks and Archer (1941) define the Shoshoni form see-buup-ee as "brush or shrub," noting also its particular application to yellow-flowering varieties. Chamberlin (1905) also notes its inclusive use for the Gosiute. The Hopi cognate /siva:pi/ also appears as an intermediate, along with /ma:ˀ3vi/ for various desert brush species. However, the interrelationship of these two forms is not entirely clear (see Chapter IV for discussion). The Tubatulabal cognate /si.ba.pu-l/ is identified only as "rabbitbrush" by Voegelin (1958).

The presence of *sibu- as an intermediate in Numic, perhaps in Hopic, and its occurrence in Tubatulabalic, may have some interesting historical implications. If we look at the present ecological distribution of the various genera commonly included, we note that they are rather widespread in western North America (Jaeger 1964; Kearney and Peebles 1960; Munz and Keck 1963). They are typical of a variety of communities in both "hot desert" and "cold desert" areas. In the "cold desert," or north of 36°30' No. Lat., their significance is surpassed by the various species of sage, of which big sagebrush (*Artemesia tridentata*) is particularly common. In "hot desert" areas, sages are much less significant, with big sagebrush being absent in many localities (see Kearney and Peebles 1960). It is interesting to note that although four of the six areas where taxonomies were elicited from Numic speakers lie in "cold desert" areas, very few informants offered the generic for big sagebrush as an intermediate over *sibu- (see Chapter III). As will also be noted by checking the Numic plant cognate sets in Appendix II, the generic for big sagebrush is also weakly reflected, showing one stem in Western and Southern Numic and a second in Central Numic. Neither of these stems is found in other non-Numic Uto-Aztecan languages according to our comparative data. However, a third stem for this species is shared by Hopi, Cahuilla and Luiseño (see Table 16).

Given these findings, we would like to suggest that the use of *sibu- as an intermediate may have some historical-ecological implications. First, *sibu- appears to have temporal priority over the various stems for sagebrush (with the possible exception of the Hopi-Cahuilla-Luiseño stem which apparently does not occur in Numic). Second, its development as an intermediate is also quite widespread, perhaps a further indication of the ecological priority of rabbitbrushes over sages in Proto-Numic environments. And third, given these two conditions, and the differential dominance of rabbitbrushes over sages in "hot desert" regions as opposed to "cold," we can suggest *sibu- lends further substantiation to southern origins for Numic speakers (see also, Chapter IV).

b. Animal Intermediates. Of the several animal intermediates that are recognized in all Numic schemes, only those for felines, owls, snakes, spiders, flies and ants seem to share cognate terminology (see Table 6). The categories frogs, toads, lizards, insects/bugs, etc., are recognized in all schemes, but terminological labels vary, each reflecting what appear to be independent developments. Many of these can also be related to generics as the various figures in Chapter III indicate.

Of these various groupings, perhaps the one of most interest is that for felines. As can be seen by referring to Chapter III, all Numic groups label such a category, even though it is not terminologically very rich. The form used to designate the category is that for wild cat, *tuku-. The names for other felines, including mountain lion and Canada lynx (where present), are derived from this form. The same situation is apparent in Tubatulabalic, in various Takic languages and probably in Hopic, all of which share cognates of Proto-Numic *tuku.

The question that might be posed here is why the form for wild cat as opposed to that for mountain lion for both derivation and for the intermediate? If we look at the distributional evidence, we note that both wildcat and mountain lion have approximately the same geographic ranges (Hall and Kelson 1959). However, while wild cats are wide ranging in terms of habitats, mountain lions (as the popular name implies) keep to higher, more densely forested zones (Hall and Kelson 1959; Hall 1946). We would suggest that the dominance of the lexeme for wild cat is probably related to the ubiquitousness of these animals in Proto-Numic and probably also Proto-northern-Uto-Aztecan environments.

The intermediate "snake" also deserves further comment. Snake is marked in all Numic schemes, usually by the form for rattlesnake, Proto-Numic *to-kog^{w}a. However, as noted above (see Specifics), this form may have the etymology "rock snake" (Sapir 1916) and thus be subordinate to a form *kog^{w}a, "snake," ultimately related to Proto-Uto-Aztecan *ko, *kowa, "snake" (UAC #395). Evidence of the remnants of *ko, *kowa (Proto-Numic *kog^{w}a) seem to appear in the Proto-Numic generic for bull snake *koko, as well as in the form for water snake/garter snake *pasi-ko and several others (see Table 3). We thus suggest an intermediate of the shape *ko, *kog^{w}a "snake" based on these forms. If this form once had a generic referent, it is no longer obvious from the identifications of the various forms.

With the exception of the intermediate "owls" from Proto-Numic *muhu, horned owl, the remaining intermediates all refer to insect groupings. We would suggest that there may be a tendency (perhaps even universal) to generalize these groupings in the absence of cultural significance attached to their differentiation. The native classifications involved are by no means as detailed as those of etymologists.

4. Major Life Forms

Major life forms, at least of the type described by Berlin (1971), are weakly developed in all Numic schemes. Table 7 summarizes the data on lexemes marking these categories for both plants and animals. In roughly half of the cases these can be traced to the generalization of generics. In the other half, forms expressing morphological or use distinctions are preferred. Several of these latter forms are derived from verbal stems of motion. As each of major life forms seems to have had a somewhat separate developmental history, we will discuss each separately.

a. Tree. Comparison of the various terms used for the life form "tree" in the Numic languages yields some marked differences, with no single term being common in all three sub-branches. In Mono, some parts of Northern Paiute territory, and also parts of Southern Paiute territory, a form related to Proto-Numic *wɨnɨ, "to stand" is used for tree [see also UAC #411, *we, *wene (*weleˀ) "to stand," sg.]. Lamb (1957) records it as /wɨnɨhpɨna/ "tree" in Mono, noting that he received it in the context of "picture texts," a device he used to elicit spontaneous linguistic data. Mahar (1958) also notes the equivalence of his [wünüdü] with

Table 7: Numic Correspondences for Major Life Forms

	Mono	No. Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	So. Paiute	Ute
Tree	wɨpɨna	wɨnɨdɨ					maʔabɨ wɨnɨda	
*huu- ?		sɨnabi cottonwood	huuppi	o-pi wu-pi sɨnabi aspen sohobi cottonwood sɨhɨbi willow	huuhpi		maʔabɨ pasiaka sapling	mah-ab
bush	qahɨh- brush	huu-pi		huu-pi		mɨhabɨ brush	maʔabɨ	
herb						mahaba weed	tɨsɨ herb (Chem) siʔapɨ weeds (Chem) maʔabɨ	
grass	papuhi	wahabɨ	hug^{W}ippə	waʔabɨ sonipɨ	puhi sonipI		wahabɨ hug^{W}ibɨ	
flower	hɨpika'	tonigaʔa	ʔarinna	tonziyanga hɨpingàʔa	totsiyaapɨ	hɨbiyeri:dɨ	sinkapɨ sɨʔipɨ	sawapyty
seed	puhsi'	ʔa-pui		peyhe	pehE	pɨyni:dɨ	puʔi-bi	
root	tɨtɨna	ʔa-tɨna		tɨdɨna	tɨdana	tʌne:k	tɨna tɨnaka	
leaves		ʔa-naka		sɨɨgibɨ			naŋka	
berry		kamadɨ	hopyə	huutɨkapɨ	poko	θuʔutɨʔɨ	tapunikantɨ	
greens		puinaadɨ		puhipɨʔɨ	puhipI		sag^{W}amaʔabɨ	
medicine		natuzua		natusu	natʃsuʔu	mʊtʊsug^{W}e	musutuk^{W}i	

Table 7: Numic Correspondences for Major Life Forms (Cont.)

	Mono	No. Paiute	Panamint	Shoshoni	Comanche	Kawaiisu	So. Paiute	Ute
game animal				wasɨpɨ			pisabibimɨ	
crawlers		nuyuadɨ		nuyuandɨ			nuyug^{w}adɨ	
birds								
little	ciipa	huziba	ʔuttui	huucuʔu	huhtsuu	witsikize	wicici	wicic
big		k^{w}iʔnaʔa		k^{w}inna			k^{w}ananci	
fliers		yozɨdɨ		yɨcɨnadɨ				
fish	pahk^{w}i	pak^{w}i kuyui		peng^{w}ɨ			pakɨʔɨci	

"tree" in the Warm Springs, Oregon, area of Northern Paiute territory. He does not comment further on its actual usage as a cover term, however. In parts of Southern Paiute territory, /wɨnɨ-/ is used in the phrase [maʔabɨ wɨnɨdɨ] "brush/ plant standing" which can be used for "tree" (see discussion, Chapter III).

Although it is interesting to note the association of *wɨnɨ- with "tree" in such widely separated areas as California, Oregon and Utah-Arizona, it seems doubtful that such usage results from the presence in Proto-Numic of *wɨnɨ- as a life form name. From these data, however, we can suggest that the Proto-Numic verb *wɨnɨ- "to stand, sg." may have been used in this early period in descriptive phrases referring to tall, woody-stemmed plants. From this type of usage, it may thus have developed the life form connotations it now has.

A second type of usage that enjoys some currency in all Numic sub-branches is that involving the elevation of a generic, usually the local form for cottonwood (Populus Fremontii S. Wats.) to the status of the life form "tree." This type of usage is in keeping with Berlin's (1972) hypothesis as to one means by which life form names develop (see above).

As we have noted earlier (Chapter III), the choice in Numic of the form for cottonwood as "tree" probably derives from the ecological prominence of these trees in the Great Basin region. They are the primary deciduous form in most areas, occurring near most semi-permanent and permanent water sources (springs, seeps, streams, etc). This distribution may also have made them important to aboriginal Numic peoples as indicators of water. Trager (1939) has noted a parallel usage for cottonwood as the life form "tree" in the Pueblo Southwest (including Hopi), as has Basso for the Western Apache (see Berlin 1972:23 for Basso's personal communication). In other regions, other generics of importance are also used as "tree" (see also Berlin 1972:23 for a summary of data).

Some confusion in the Numic data results from variations in the local name for cottonwood. As we have noted previously, in some parts of Northern Paiute territory, Proto-Numic *sɨna- the form for aspen, is used for cottonwood, while Proto-Numic *soho-, the form for cottonwood, is used for aspen. Miller, Tanner and Foley (1971) report similar reversals in parts of present-day Shoshoni territory. The Southern Paiute situation, at least from investigations thus far, seems to lack this feature of local variation, retaining Proto-Numic *sɨna- and *soho- in their original meanings. However, only in one area investigated, i.e. in Kaibab, did the form for cottonwood double as "tree." In all other areas, the form for plant/brush [maˀabɨ] served in this capacity, at least in some manner (see Table 7). Although nothing precludes the possibility that cottonwood also equaled tree or at least deciduous tree in Proto-Numic times (see parallel Tubatulabal usage), there seems little reason to propose that either *sɨna- or *soho- had lost their generic status by that time.

Perhaps of more interest to our discussion of a possible Proto-Numic life form for tree is the use of the form for "stick, wood," (Proto-Numic *huu-) in various contemporary languages as a near equivalent (see Table 7). Such usage occurs in Northern Paiute, Panamint, Shoshoni, Comanche and, by some extension, in Southern Paiute as well. It is also found as a primary semantic association in most other non-Numic Uto-Aztecan languages.

As we have noted previously (Chapter IV), nearly 100 years ago J. W. Powell recorded the form <u>ho-pi</u> from Northern Paiute informants as a cover term for plants, but also for trees [see for example, his category of animals "tree climbers," [ho-pi-ma-po-yu]. R. V. Chamberlin, gathering data on Gosiute Shoshoni ethnobotany near the turn of the century, also recorded the form [o-pi~wu-pi], defining it as "wood, tree or shrub, woody plant, plant, stick, etc." (Chamberlin 1905:392, 404). Contemporary field work in Central Numic reveals that /huu-ppi/ can be used for tree in Panamint (Lamb n.d.), in scattered areas of western and northern Shoshoni territory (Miller, Tanner and Foley 1971) and in Comanche, where Conange (1958:135) records /huuhpi/huuh-/ as "tree, stick, club, log, woods." The Southern Paiute cognate [obipɨ]~[ubipɨ], also means "stick, wood," but carries as well a definite semantic association with the domain plants, especially in the sense "dead trees, dead brush." Sapir (1931:705) also records what may be a related form [-úi-p.i-] as "stalk."

Added to these various Numic distributions are several others for non-Numic Uto-Aztecan languages. In Tubatulabal, the apparent cognate /ʔuuʔu-t/ is cottonwood tree and tree, but also "stick, pole" (Voegelin 1958; E. W. Voegelin 1938). Hopi has non-cognate /coki (~cocki)/, "erect plant - as bush or tree" (Voegelin and Voegelin 1957:21), but also /ho-qȫlö/, defined as "woods, forest." The latter, which may be a cognate of Proto-Numic *huu-,[28] is derived from the stem /ho-/, "juniper" plus the plural marker /-qölö/. Other cognates are found in Papago, where /haʔicu~ʔuʔus/, "trees and bushes" is literally "stick things" (Mathiot 1962), in Yaqui and Mayo where [huya] and [huyya] are "tree," in Tepehuan where [usi] is tree and in Tepecano where [-u.c] is "stick, tree" (Key 1954; see also Miller 1967:64).

The forms for the Takic and certain other Uto-Aztecan languages, while apparent non-cognates with Proto-Numic *huu-, also reflect a semantic merging of "tree" with "stick, wood." These appear to be part of yet another association in Uto-Aztecan, that of "tree, wood and stick" with "fire" (see Miller's UAC #170a-g, for *ku, fire, *kuna, firewood, *kusi, wood, *kuta, stick of wood, *kut, make fire, *kui, tree, etc.). Within Takic, Bright (1968) records Luiseño /kula.-wu-t/, "tree, wood, stick," Hill (1966) notes Cupeño cognate /kəlawət/, "wood (tree?)," and Kroeber (1909) adds Cahuilla

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[28]According to Voegelin, Voegelin and Hale (1962), Proto-Uto-Aztecan *u is reflected as /o/ in Hopi; thus /ho-qolo / "juniper" could be a cognate of Proto-Numic and Proto-Uto-Aztecan *huu or *hu, "stick, wood;" see also Appendix C.

[qelawut], "wood, tree." These can be summarized as Proto-Cupan *kəlawat (Bright and Hill 1967). The Serrano form [kotcat] is defined by Miller (n.d.) as "wood," with no mention of "tree."

Outside of Takic, we find other forms from this association functioning as tree. In Tarahumara, [kusi•kusi-ki] is "wood, stick, log, tree" (Thord-Gray 1955). In Huichol, McIntosh and Grimes (1954:6) record [kəye] as "tree, wood" (see also Price 1967 for [kəye, "tree trunk"). Miller (1967: 34) also lists a Papago form [kui] as "tree." However, Mathiot (1962) and Saxton and Saxton (1969) indicate that [ˀuˀus] serves in this capacity and that [kuˀagi] is "wood, firewood." Voegelin and Voegelin (1957:21) define Hopi /koho/ as "the wood of any tree, stick."

Thus, we seem to have in all of Uto-Aztecan, a close semantic association between the life form "tree" and "stick, wood, firewood," etc. This association has dual representation in the various languages in forms summarized as *hu (UAC #474, *hu, wood; Proto-Numic *huu), "stick, wood, tree" and *ku with its related forms *kuta (Proto-Cupan *kulawut, Serrano [kotcot], *kui (Cora, Huichol), etc., "firewood, stick, tree." From the evidence cited, we can suggest that a concept of the unity of trees and other woody-stemmed forms (see Bushes, below) with their products (wood, sticks, etc.) and uses (firewood, etc.) is characteristic of Uto-Aztecan and perhaps of some antiquity. However, since all of these forms, including Proto-Numic *huu-, carry denotations other than "tree," they seem to reflect the life form concept only covertly. We can probably conclude that there was no Proto-Numic life form meaning specifically and only "tree," although *huu- may have had this added meaning (see Appendix C).

b. Bush. Again, with reference to Table 7, we note that the concept "bush" as a life form is also weakly developed in all Numic schemes, with various and usually non-cognate forms being represented in the modern languages. In some of those areas where /huu-pi/ is used as an equivalent for "tree," the form is also extended to "bush;" i.e. in the Gosiute Shoshoni area, according to Chamberlin (1905) and in western Nevada Northern Paiute according to Powell (Fowler and Fowler 1971). In these areas, however, the concept "trees and bushes" or perhaps "woody-stemmed plants" seems to be implied rather than a polysemous distinction between the life forms. Certain non-Numic Uto-Aztecan languages also merge these categories into a single unit, although such usage does not appear universally in the stock (see Trees, above). In those Numic areas where the generic "cottonwood" is used for tree, this type of extension also seems to be absent.

In the Kawaiisu-Ute sub-branch of Numic, as we have noted previously, the form /maʔábɨ/, or its near equivalent is sometimes recorded as "brush" [see for example, Klein (n.d.), [mɨhábɨ] "brush" in Kawaiisu; also Kaibab Southern Paiute [ma.á-bɨ], "flower, brush" (Sapir 1931:562); and Chapter III]. However, it also has various other meanings, including "tree and bush" in Chemehuevi and "plant" and/or "wild plant" in various Southern Paiute areas. Thus, its status as a life form is unclear. We will discuss it further with reference to its most inclusive meaning "plant" under "Unique Beginners," below.

Thus, none of the forms described seems to meet the minimal requirements to warrant its further consideration as a Proto-Numic life form for "bush."

c. Grass. A category frequently equated by informants with English "grass" is one of the most distinct and widely distributed of the Numic life forms. Although its taxonomic parameters are not always precisely defined (see Chapters III, IV), it seems to include plants principally of the botanical family Gramineae, but also some members of the sedges (Cyperaceae) and rushes (Juncaceae) and occasionally the onions (Amaryllidaceae). These forms are grouped together in all areas on the basis of shared features of stem and leaf shape; i.e., all have slender, parallel-sided leaves and/or long, narrow stems. Grasses can be further differentiated by color and by habitat as are other Numic plant forms (see Chapter III). Rushes may also be described as "water grass" in all Numic languages, a designation that is more indicative of their contrastive status than inclusion (see above).

Comparison of the various terms labeling the life form "grass" in Numic (Table 7) indicates some similarities, but also some differences. There is some tendency for each language and area to have its own life form, but not necessarily to the exclusion of others either as lesser forms or as generics. Mono, according to Lamb (1958b), has /pa-puhi/ "grass," probably from Proto-Numic *pa-, water, plus *puhi, green/blue (?) (see also Comanche /puhi/, grass). Northern Paiutes from the Mono Lake country north through Warm Springs, Oregon (Steward 1933; 1938; Kelly 1932; Mahar 1956), use /wa-habɨ/, from the generic for giant wild rye (Elymus cinereus). Shoshoni from many areas use cognate /wahabi/~/waabi/ for the seeds of wild rye, but refer to the plants by their term [sónipɨ], "grass." Southern Paiutes use /waʔábɨ/ for "tall" grasses, including Elymus spp. and Agropyron spp., reserving their [ugwíbɨ] or [hug^{w}íbɨ] for "short" and "bunch" grasses. Panamint /hug^{w}ippə/ is given by Lamb (n.d.) as "grass."

Of the various non-Numic Uto-Aztecan languages, only Hopi and Tubatulabal seem to have cognates for *huk^{w}i- in /ho:ki/ Stipa spp. (Whiting 1939) and /ʔuugibi-l/, "rice grass" (Voegelin 1938) or "bunch grass" (Voegelin 1958). Other non-Numic Uto-Aztecan languages appear to reflect an additional stem, tentatively reconstructed by Miller (1967) as *(pa) sa, *(pa)ca, "grass." Bright and Hill (1967) give the Proto-Cupan cognate of this form as *samVt, "grass." Although Miller (1967) lists Hopi [s3h3] as part of this set, it may also relate to another of which Shoshoni [sihu], Agrostis spp. may be a part.

Of the various forms recorded, we can reconstruct with some degree of certainty only two as Proto-Numic:[29]

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[29]It is also possible that Shoshoni /sonipɨ/, "grass," may have Proto-Numic or perhaps early Numic origins. If the comparative data as to the distribution of this form

*wa?a-, perhaps once Elymus spp., and *hug^{w}i-, an undetermined type of bunch grass, but probably a member of the grass "tribe" Agostideae (thus far, all positively identified species related to *hug^{w}i- are of this "tribe"). Based on distributional evidence, we will also suggest that *hug^{w}i- is the older form, and that in all likelihood, it had achieved at least partial status as a life form prior to Numic internal divergence. The ascendence of *wa?a- to a life form position may have come at some early period in Numic history, perhaps as related to the importance of rye grass as a food source.[30]

d. Herb. From the evidence now at hand, only the Chemehuevi (Ute) appear to have a distinct life form for herbaceous or non-woody stemmed plants. This form, [tɨsɨ́], is shared only by the Hopi, where cognate /tɨ:sɨ/ is defined by Voegelin and Voegelin (1957) as "weed." Whiting (1939: 64) gives what is probably a related form [tu:saka] as "grasses and many other herbs." This distribution is too restricted to postulate a Proto-Numic form, although we will return to a discussion of [tɨsɨ́] when we deal with possible

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were more complete, we might find a relationship between it and Miller's (1967:26) Uto-Aztecan set *sunu, "corn," either as a cognate, or as an inter-stock borrowing. The intriguing question would then be when the shift of meaning occurred.

[30]There is also a possibility that the use of *wa?a- in the western Basin and *huk^{w}i in the eastern and southern Basin has an ecological basis. According to Pohl (1953) concentrations of Elymus are more common in the west, while Agrophyron is more typical of the east. The entire problem merits further consideration.

Southern Paiute-Hopi relationships (see Chapter VI).

e. Plant Part Names. The remaining forms that function in Numic as taxonomic equivalents of life forms are the designations for various plant parts; i.e. seed, root, berry, leaves or greens and flower (see Table 7). As with most of the other life forms above, we can only suggest, based on distributional and other lines of evidence, that some of them so served in Proto-Numic times. Of the various forms, seed and root are the most widely distributed, with cognates in each Numic language. These can be reconstructed as Proto-Numic *pusi, "seed," but also "eye" and *tɨdɨna, "root." These in turn go back to Proto-Uto-Aztecan *pusi~*puci (UAC #160a), "eye," but also "seed," and perhaps *na, "root" (UAC #356). The form for leaf is less widely distributed, reflecting one form related to Proto-Numic *naŋka, "ear" in Northern Paiute, Southern Paiute and some Shoshoni areas, a second /sɨgibɨ/ in most of Shoshoni and a third, [puhipI], related to "green" in Comanche (see also "greens" in Northern Paiute, Shoshoni and Southern Paiute). Proto-Numic *naŋka, "ear" may have been extended to leaf on a parallel with *pusi, "eye" to "seed." There also appear to be taxonomic parallels for these two forms in Tubatulabal /punẓil/ "large seed," and /naŋkabil/ "leaf." There seems to be no unity in the various forms for "berry." However, given the Northern Paiute and Southern Paiute usages (see Table 7), it is possible that it was merged with "seed."

The forms for "flower" (Table 7) seem to be more regionally specific than culturally or linguistically defined. Mono, Kawaiisu and some central Shoshoni groups reflect related forms /hɨpika'/, [hɨbiyeri:dɨ/ and /həpin-kɔppɔ/, respectively, while Northern Paiute and the northern areas of Shoshoni territory (including Comanche) show [toní-gaʔa] and [tónziyanga] or [totsíyaapɨ], respectively. Southern Paiute reflects [sɨʔíŋkapɨ]~[siŋkapɨ] and Chemehuevi, related [sɨʔípɨ]. These Ute forms are apparently related to Proto-Cupan *sə- and Serrano [sɔɔʔ-], "to bloom, flower" (Bright and Hill 1967; Hill 1967) and probably ultimately to Uto-Aztecan *se, "bloom, flower" (UAC #178a). The Hopi form [sihɨ], "flower" is probably also a cognate, although Miller (1967) derives it from a related stem *si (UAC #178b).

The Ute stems appear to be the oldest, probably representing at least Proto-Numic *sɨʔi-, "to bloom, flower." The Mono, Kawaiisu and central Shoshoni forms show enough correspondences (especially with Southern Paiute [sɨʔiŋkapɨ]) to suggest that they are either part of the same stem, perhaps *sɨʔiŋka- or *sɨbiŋka-, or are an early inter-dialect borrowing. The Northern Paiute and northern Shoshoni forms [tonígaʔa], etc., are thus either extra-Numic borrowings or innovations.

One might legitimately question whether these various terms for plant products served similar taxonomic functions in Proto-Numic times, for apart from the Tubatulabal taxonomy presented in Chapter IV, we have little other direct evidence of their use. However, some indirect evidence might also be cited here, from notes on the function of certain classifiers in Numic, perhaps relating more specifically to the denotative meaning of certain proto-generic names.

As noted in Chapter III, and again in the section on generic reconstructions, various of the unitary simple lexemes in the Numic taxonomies can occur with or without classifiers of the shape /-pi~-bi/ and/or /-pɨ~-bɨ/. Although all of the functions of these forms are not known as yet (see Sapir 1930; Liljeblad 1966), one of their correlations involves a change in the focus of meaning of the form from a specific plant product to the plant in general; i.e., [akɨ] and [tɨba] without classifiers refer to sunflower seed and pinyon nut, respectively, while [akɨmpɨ] and [tɨbapi] refer to sunflower plant and pinyon tree (Southern Paiute examples; see Table 8 for others). Forms that show this feature are found in all Numic languages with varying frequency. Curiously, the number of stems involved increases in the southernmost languages in geographic distribution; i.e. in Mono, Kawaiisu and Southern Paiute (Ute). (The situation in Panamint is unknown at present). It is also interesting to note that those stems that display this feature are those we have previously suggested are probably the oldest (compare Table 8 to Sets I, II, above).

Based on these findings, we would suggest that the focus on plant part categories in Numic taxonomies may be related to this feature. In other words, forms without classifiers refer to plant products and thus should be organized into categories such as seeds, roots, leaves, etc., and ultimately, also perhaps into the dichotomy *eaten/not eaten*. Since this feature appears to be an old one in Numic, we will

Table 8: Plant vs. Plant Part: Numic Classifier Suffixes (Examples)

Mono: (Lamb 1957)	tɨpa	pinyon nut
	tɨpa-pɨ	pinyon tree
	kunuki	elderberry
	kunuki-pɨ	elderberry bush
	sɨhɨ	willow
	sɨhɨ-pɨ	willow tree
	wiya	black oak acorn
	wiya-pɨ	black oak tree
	wohqo	ponderosa nut
	wohqo-pɨ	ponderosa tree
	etc.	
Northern Paiute: (Reno)	tɨba	pinyon nut
	tɨba-pɨ	pinyon tree
Kawaiisu: (Zigmund 1941)	tɨva	pinyon nut
	tɨva-pɨ	pinyon tree
	kuʔu	Mentzelia seed
	kuʔu-vɨ	Mentzelia plant
	mahakuʔu	Mentzelia seed (2)
	mahakuʔu-vɨ	Mentzelia plant (2)
	etc.	
Ute: (Cedar City)	tɨba	pinyon nut
	tɨba-pɨ	pinyon tree
	akɨ	sunflower
	akɨmpɨ	sunflower plant
	waʔi	rice grass
	waʔaibɨ	rice grass plant
	ʔiʔisi	squawbush berry
	ʔiisi-bɨ	squawbush
	aka	tansy mustard
	akata-pɨ	tansy mustard plant
	saimpi	cattail/tule
	saimpi-bɨ	cattails/tules
Panamint: (no examples)		
Shoshoni: (Owyhee)	sigo	sego lily bulb
	sigo-bi	sego lily plant

further suggest that a taxonomy based on edible products is also of some antiquity, probably predating Numic divergences. Plants defined in more recent times, as well as those of less direct importance, are thus given taxonomic positions in keeping with these same principles; i.e. according to use and/or products produced.

f. Medicine. The various Numic forms labeling the category medicine also appear to be cognates, although the Kawaiisu-Ute forms are somewhat aberrant. Southern Paiute [musutuk^{w}i] seems to be a metathesized form of Kawaiisu [mɔtɘsug^{w}e], thus probably related to Proto-Numic *tusu- or perhaps even *natusu-.

Lexemes marking the Numic major life form categories for animals are also given in Table 7. As can be seen from the forms presented, there is considerable variation across the region, with few categories giving evidence of cognate relationships. Several are nominalized verb stems as opposed to elevated generics. As with the plant life forms, we will discuss each in turn.

g. Game Animal. A category for large game animals (all edible) is marked in all Numic schemes by a variety of lexemes, none of which appear to be cognates. All of these forms also have transparent etymologies. They express the unity of these animals by calling attention to morphological features, such as their hooves (Northern Paiute) or their horns (Southern Paiute), or by describing them as the ones killed (Shoshoni), the ones hunted (Northern Paiute, Shoshoni) or merely as game animals (a separate lexeme in

Southern Paiute, Chemehuevi). Since taxonomic data for this grouping are so poor in the other non-Numic Uto-Aztecan languages (see Chapter IV), we cannot suggest that any of these various stems has priority as a Proto-Numic life form. Some are traceable to Proto-Numic in other capacities, however.[31]

Before continuing, we should note a curious semantic parallel that occurs with reference to this category. In all of the Great Basin, cognate forms for "mountain sheep" appear to be lacking. Where reported, they vary from area to area. The Northern Paiute form is [kóipɨ], the Shoshoni form is either [wásɨpi] and/or [túku], depending on area and the Southern Paiute-Ute form is [nagá]. However, in spite of the differences, two and perhaps three of these forms share a common feature of derivation. Northern Paiute [kóipɨ] is probably from /koʔi-∼koi-/, "to kill (pl)." Shoshoni [wásɨpi] is from /wasɨ-/ "to kill (sg)." Shoshoni [túku] may reflect a related concept in that it is apparently from /tukku/, "meat, flesh" (see also UAC #279, *tuhku, meat, flesh). An additional parallel may be provided in the Tübatulabal forms /paaʔa-t/ "mountain sheep" and /paʔagin-/, "to hit, beat" (see also Takic and Hopi cognates for "mountain sheep" and UAC #244, *paka, paki, to kill, beat).

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[31]The stem "to hunt" [tɨhoa-] in NP has parallels in the various Takic languages (see Chapter IV). Numic forms for "hair, fur" *pɨhɨ- can be related to others in Uto-Aztecan, summarized by Miller (1967) in his UAC #212a; similarly "horn" (UAC #235) and "nail" (claw) (UAC #298a).

Just what these parallels may represent, if anything, is difficult to tell without further inquiry. However, a possible clue is provided by at least one Northern Paiute mythological tale relating the skills of mountain sheep as a hunter (Fowler and Fowler 1971:223). We have already noted that mythology functions in category building in various systems.

h. <u>Crawlers</u>. Taxonomies elicited from three of the Numic groups tested show a category "crawlers" marked by cognate lexemes from the Proto-Numic verb stem *nuyug^{w}a- "to crawl close to the ground." Although this form appears to be strongly reflected, in the absence of comparative data from other non-Numic groups, we can only suggest its former use.

i. <u>Fliers or Birds.</u> Only two of the Numic groups from whom taxonomies were gathered marked a life form "fliers," covering both "birds" and "flying insects." These are Northern Paiute with [yozɨ́dɨ], and Shoshoni with [yɨ́cɨnadɨ]. These stems may derive from a single form, although this is not completely clear.[32] Southern Paiute may have a related stem in [yaasa-], "to fly" (Sapir 1931). However, Southern Paiute informants did not offer this form as a cover term (see Chapter III). Rather, they preferred to use the form for "bird/little bird" separately, treating flying insects as part of the category "bugs" (see again, Chapter III). In the absence of any other corroborative evidence for this category in Numic or any other Uto-Aztecan group, we hesitate to give

[32]Shoshoni [yɨcɨ-], according to Miller (personal communication) is both "to get up" and "to fly." Northern Paiute seems to have two stems, [yozɨ-], "to fly" and [yɨcɨ-] "to move." Southern Paiute has [yaasa-], "to fly."

it Proto-Numic status.

Although the category bird is considered subordinate to "fliers" in some Numic taxonomies, it has the status of a full life form in others. It also appears to so function in several other non-Numic Uto-Aztecan taxonomies. However, as we noted in Chapters III and IV, there is some variation across the region in the use of terms for "bird." The most typical pattern in Numic is to give primary emphasis in usage to a dual division of this category into "large bird" and "small bird" rather than to a single life form. This dual division is marked by separate lexemes in each case. In those areas where there is a single life form name, it either corresponds to the term for "small bird," or to an alternative form "those with wings/feathers" (see Northern Paiute and Shoshoni [kasagaʔyu] and [kasagantɨ], Chapters III and IV). The stem for "large bird," commonly derived from Proto-Numic *k^{w}inna, *k^{w}anna, "eagle," is rarely used in this capacity.

Comparison of the Numic forms for "small bird" and by extension, "bird (incl.)," leaves us with some doubt as to their ultimate relationship (see Table 7). The Mono form /ciihpa/ and the Northern Paiute form /huziba/ appear close enough to postulate a Proto-Western Numic form *cipa. These may in turn be related to Kawaiisu [witsikize] and Southern Paiute-Ute /wičici/, although the correspondences are irregular. The Panamint and Shoshoni forms show the most deviation, with forms from [ʔuttui] in Panamint (Good 1964) to /huiccu/~/huccuu/~/huhtsuu/ in Shoshoni and Comanche being recorded in various areas. The initial syllables of these forms parallel most closely Northern Paiute initial /hu-/ in /huziba/. The Northern Paiute and Shoshoni forms also parallel the respective names for sage hen: [huzzi] and [hucuʔu]. Miller, Tanner and Foley (1971) suggest that onomatopoeia may account for the discrepancies in the Panamint and Shoshoni forms.

If we look at broader distributions, we note apparent cognates for the Kawaiisu-Ute (and perhaps the other) forms in Cahuilla [wik'ik-mal], "bird," Serrano [wici-t], "bird," Luiseno /wiʔkas-mal/, "bluejay," and Mayo, Yaqui and Huichol [wiikit] [wiikit] and [wiikii], apparently also "bird" (Key 1954). Miller (1967:20) suggests the form *wici~*wiki to cover these correspondences (UAC #40, bird). It is possible that Hopi /ciro/ "bird" (Voegelin and Voegelin 1957) or "little bird" (Whiting, personal communication 1969) is also related. The Takic and Tubatulabalic forms appear to derive from a different stem (Luiseno /ʔihen-mul/, Cupeno /hinii/, Cahuilla /hen-hen-ik/, Tubatulabalic /ʔuhula-t /), probably related to a verb "to fly" (see UAC #183, *hini, to fly).

In the absence of any clear generic referents for these forms, we can probably assume that by Proto-Numic times, a form related to *wici *wiki was already in use as a life form at least for "little birds." The use of a separate term for "large birds," Proto-Numic *k^wanna,*k^winna, "eagle" is also suggested, although data for its wider distribution are not as good. As far as we know, only the Hopi appear to use a parallel concept, with "eagle" (Hopi /k^wa:-h/) being used inclusively for "large birds" (see Chapter IV). In Takic, the stem /k^wa-/ is found in names for condor and hawks in some languages, perhaps a further indication of the applicability of this concept.

j. Fish. Terms for the life form "fish" in Numic also pose certain problems. As we can see from Table 7, all contain what appears to be the prefixed form for "water," Proto-Numic *pa-. Beyond this, however, there is some variation in the second syllable, with Western Numic reflecting /-k^wi/, Central /-ŋk^wi/ and Southern /-kɨci~-kɨʔuci/. If we consider additional data and distributions, we note that several languages in Southern California share what may be a related stem. Bright and Hill (1967) reconstruct the form as *keyul for Proto-Cupan (Luiseno /kiyuul/, Cahuilla /kiyu-l/, Cupeno /qəyu/). Serrano has related /kihutu/, while Tubatulabal reflects /kuyuu-l/. Hopi shares what may be a cognate in /pa-kiw~pa-kiwɨ̇/.

In view of these correspondences, a second Northern Paiute stem also becomes of interest. This is Northern Paiute /kuyui/, the name for "black sucker" (Chasmistes cujus), a fish of a very ancient type now found only in Pyramid Lake in western Nevada, but which once enjoyed a wider distribution in the Lahontan System (LaRivers 1962). Based on the presence of this form, we will tentatively suggest that a Proto-Numic form *kɨyu-~*kuyu may be the source of the Northern Paiute and Southern Paiute forms, and that this may be ultimately related to the Takic and Tubatulabalic forms. It is possible that the Western Numic and Central Numic forms may also be related, although we will have to have more data on Proto-Numic to modern Numic phonological transitions before we can be certain. A suggested proto-form for these may be found in *pa-kɨyu, perhaps a second generic for another fish.[33]

In the absence of any specific referents for these various stems, with the exception of Northern Paiute /kuyui/, we cannot positively identify the referent of Proto-Numic *kɨyu~*kuyu, or *pa-kɨyu. Its status as a life form must also be held in question, although given the Takic and Tubatulabalic evidence, it may have achieved this position by Proto-Numic times. We will return to a discussion of the possible historical significance of "fish" in Chapter VI.

5. Unique Beginners

Unique beginners, at least of the type described by Berlin (1972), are weakly developed in all Numic schemes, with the possible exception of Southern Paiute-Ute. Except for these latter forms, none appear to have their origins in further generalization of generics, intermediates or life forms. In Northern Paiute, as we have noted previously (Chapter III), the forms serving as unique beginners also have other functions. The form for plant, [náadɨ], literally "grower," and for animal, [yɨcɨ́ŋadɨ], literally "mover," may be applied in contexts other than those involving plants and

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[33]We have noted previously the tendency for all Numic speakers to form new generics by making a habitat differentiation, specifically with the form *paa-, "water" (see Set III, and discussion of Specifics).

animals. The verb /naa-/, "to grow" is also applied to humans, for example.

In Shoshoni, there appears to be some differentiation in unique beginners, which are also derived from verb stems. The form for plant [sɨ́aka], comes from the stem /sɨ́a-/, "to grow" which, according to Wick Miller (personal communication 1971) is connected rather specifically with plants; i.e., /sɨa-/, is "to grow, of plants." It may ultimately be related to the Proto-Uto-Aztecan stem *se,*si,*so, "to bloom," "flower" (UAC #178a, b, c) [see also forms for "leaf," etc., in Shoshoni (Chapter IV) and Chemehuevi [siʔápɨ], "weeds."]. The Shoshoni cognate of Northern Paiute /naa-/ is /nahana-/, "to grow, of persons and animals" (Wick Miller, personal communication 1971).

The form [nɨ́midɨdɨ], given by Owyhee Shoshoni as "things that move around," (animals), also comes from a verb stem /nɨmi-/, "to move around, wander, survive, make a living in the aboriginal manner" (Miller, personal communication 1971). It was also recorded by Powell (1880) as a cover term for game animals in Northern Paiute (see Chapter IV). Conange (1951) also lists an additional form [yɨýɨmuhkuna] for Comanche, defined as "animal life." Its etymology is not given.

Southern Paiute [maʔábɨ] "plant/brush" and [paʔábi] "animal," appear to be unique developments within Numic biotaxonomic nomenclature. Although [maʔábɨ] has some varying definitions within the Ute dialects (see Chapter III), it is quite clearly approaching the unique beginner status. Its ultimate origin does not appear to be any presently recognized Kawaiisu-Ute generic. It seems likely, however, that it is related to Hopi [ma:ʔ3vi], an intermediate for various types of desert brushes (see Chapter IV). Southern Paiute and Hopi show a number of rather unique category correspondences, as we will see in Chapter VI--enough to suggest a good deal of interchange.

The origins of Southern Paiute [paʔábi] "animal" are more obscure. It appears to be the result of generic generalization from [paʔábi], "bugs," but this is far from clear. The cultural significance of this generalization is unknown at present.[34]

Beyond the various forms that serve as unique beginners for the Numic schemes, there are two other dimensions to be noted. These are the groupings land vs. water, as a basic division within the unique beginners, and eaten vs. not eaten as dimensions giving maximal orientation to the schemes. The distinction between land and water forms appears to be a deeply rooted characteristic in all the data on Numic biotaxonomic principles. Although most groups mark only the latter distinction, both occur frequently in conversations. Phrases such as [páawainaadɨ] "in the water growth" (NP) or [páakupantɨ] "in or under the water" (S) are typical of discussions. The exact phrasing may vary from area to

[34]Again, we might look to mythology to provide some clues. However, a preliminary examination of recorded tales (Fowler and Fowler 1971; Sapir 1930) gives little indication of the importance of "bugs" in activities.

area, but the distinction is always made. Designating new generics by making the opposition "water __" is also the most active process in generic formation (see Generics, Specifics, above). We thus suggest that the distinction is very basic, and dates to Proto-Numic times.

We have noted repeatedly the importance of the eaten vs. not eaten distinction in all schemes (see Chapter III). It is marked by cognate morphemes in all systems. These derive from the verb stem "to eat," and its negative, which can be reconstructed as Proto-Numic *tɨka and *kai *tɨka. There is little direct evidence for the use of this concept in other non-Numic Uto-Aztecan schemes, with the possible exception of the Hopi classification (see Chapter IV). However, indirectly, we might infer its use for both Numic and Tübatulabal, based on the presence and importance of "food name" and plant part terms as organizing principles (see Chapter IV). We have already noted that many of the important plant names in Numic designate food products rather than the entire forms. The eaten vs. not eaten dimension may interact and interpenetrate the dimension plant/animal in the semantic deep structure (see Chapter III).

Given the various generic, specific, intermediate, major life form and unique beginner similarities and differences discussed, we have constructed Figures 30 and 31 to represent hypothetical Proto-Numic biotaxonomic classification schemes for both plants and animals. We will discuss the forms within the various categories in the chapter that follows.

EATEN *tɨka-

NOT EATEN *kV *tɨka

Plants

land plants

woody-stemmed *huu- (?)

flowers *sɨʔi- *sɨʔiŋka *sɨbiŋka

water plants *paa- (?)

seeds *pusi	berries (*pusi ?)	roots *tɨdɨna	leaves *nanka	medicine *tusu-				
*pakɨ^{n}- *akɨ^{n}- sunflower *koo- chenopod *kuʔa *kuma blazing star *wata seepweed *waʔi ricegrass *aca tansy *pasi chia *k^{w}ia acorn *wiya acorn	*pogo^{n}- currant *tɨwa^{n}- service berry *kunik^{w}i elder-berry *ici *pici Rhus (?) *huʔu Lycium *ciʔa^{n}- rose *wiʔa^{n}- buck-berry	*tunna biscuit-root *sigo sego *yampa carrot *tuʔu Orobanche *kana (?) bitter-root	*siʔi onion *kɨnka onion *muʔa onion *cɨnna thistle *waha grass *huk^{w}i grass *tɨsi salt grass *mono^{n}- grass	*tonca balsam *hɨna Purshia/ Cowania *tutu- Ephedra *tono- grease-wood	*tono- grease-wood *tutu^{n}- Ephedra *hɨna- Purshia/ Cowania *sibu^{n}- brush *sibu^{n}- rabbit-brush *kanɨ^{n}- hopsage	*saga- narrow-leafed cotton-wood *sono- cotton-wood *sɨna- aspen *waʔa- juniper *woko- pine *sana-(?) fir *yuwi- spruce *tuna^{n}- mt. mah-ogany	*wiha hemp *tɨmaya mansanita (?) *kana willow *sɨʔɨ- basketry fiber *nabu prickly pear *mɨca cactus	*toʔi cattail *sai^{n}- tule *paka cane

Figure 30: Hypothetical Proto-Numic Plant Classification

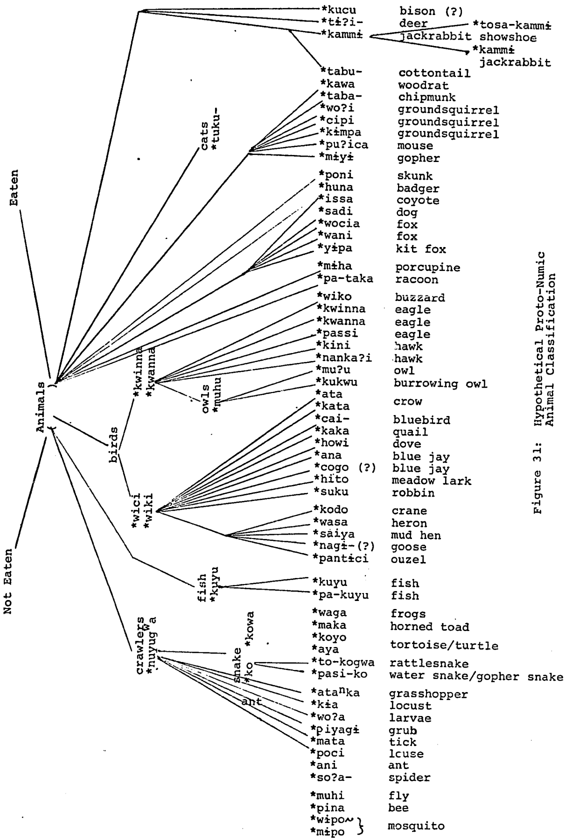

Figure 31: Hypothetical Proto-Numic Animal Classification

VI. FURTHER HISTORICAL CONSIDERATIONS

In Chapter V, we attempted to trace the history of the development of the Numic biotaxonomic systems by means of a series of reconstructions that considered broader linguistic relationships. This was viewed as necessary for two reasons: 1) because of the distinct possibility of exchange of forms among speakers of the Numic sub-branches and languages, given aboriginal socio-economic patterns; and 2) because the Numic data are incomplete in themselves and do not satisfactorily resolve questions of origins. Broader comparisons are required to identify both older (Proto-Numic) and more recent (modern Numic) culture-historical links.

The procedure of reconstructing sets of lexemes related to the various taxonomic levels in the Numic systems is a useful first step in tracing internal and external relationships. Reconstructions are relatively easy at the level of proto-generics, where the data are more complete and probably even more stable (see Chapter V). Many generics have wide distributions, so that a number of extra-Numic relationships with possible historical implications can be noted. At higher levels, inadequacies in the non-Numic Uto-Aztecan data become increasingly more apparent, as do unique cultural and environmental influences on the systems. Other problems, such as establishing exact proto-referents also come into play (see Chapter V). However, even at these levels, some important clues to Numic culture history are provided.

We will now attempt to look at these data on Numic-Northern Uto-Aztecan biotaxonomic relationships from a second perspective: that of considering more specifically the number and nature of the forms shared by the various branches (Numic, Hopic, Tubatulabalic, Takic). These comparisons should bring into sharper relief inter-branch and inter-language relationships only alluded to in our previous analysis. As the data under consideration refer to natural phenomena, i.e. to plants and animals, further analysis of them should also provide clues to early geographic patternings and to possible proto-homelands.

A. Inter-Branch Comparisons

In order to make these comparisons, a number of inter-branch cognate lists were drawn up. These are given in Tables 11-17. In addition, cognate densities and percentages were computed between the various branches (see Elmendorf 1958; Voegelin, Voegelin and Hale 1962). Figures for numbers of comparisons possible between given branches (based on identifications by modern genera and/or popular names), and cognates shared are given separately for plants and animals in Table 9a, b. Inter-branch cognate percentages based on these figures are given in Table 10a, b, c. These figures can be considered as rough approximations of relationships only. They do not imply time depths in themselves. It is interesting to note, however, that they are in general agreement with figures obtained by other methods (Swadesh 1954); Voegelin, Voegelin and Hale 1962; Hale 1958; 1962). The

Table 9: Northern Uto-Aztecan Inter-Branch Lexical Comparisons (Plants and Animals)

(First figure indicates cognates shared; the second, comparisons possible)

a: Plants

	Hopic	Tübatulabalic	Takic
Numic	31/72	30/48	21/51
Hopic		17/30	15/46
Tübatulabalic			15/36

b: Animals

	Hopic	Tübatulabalic	Takic
Numic	31/71	32/74	35/85
Hopic		26/53	15/49
Tübatulabalic			30/47

Table 10: Northern Uto-Aztecan Inter-Branch Cognate Percentages (Plants and Animals and Combined)

a: Plants

	Hopic	Tübatulabalic	Takic
Numic	44%	60%	40%
Hopic		56%	33%
Tübatulabalic			43%

b: Animals

	Hopic	Tübatulabalic	Takic
Numic	43%	41%	42%
Hopic		39%	31%
Tübatulabalic			63%

c: Combined

	Hopic	Tübatulabalic	Takic
Numic	43.5%	50.5%	41%
Hopic		47.5%	32%
Tübatulabalic			53%

discussions that follow relate to the specific inter-branch connections as viewed from these data.

1. Numic-Tübatulabalic Relationships

Table 11 identifies the Numic-Tübatulabalic plant and animal cognates. Those shared by Tubatulabalic and reconstructed for Proto-Numic are listed first. These are followed by those shared between Tübatulabalic and various individual Numic languages. In some cases, phonological similarities between the languages has precluded positive identification of borrowings. However, given what we know of their proto-phonologies (Voegelin, Voegelin and Hale 1962; Miller 1967), we can be reasonably sure that most of the comparisons listed are valid and reflect genetic connections. Those for which there is some doubt are so indicated (see Table 11).

As can be seen from these comparisons, and from the various figures and percentages given in Tables 9-10, Numic and Tubatulabalic share a considerable number of forms. In terms of total number, only the Numic-Hopic figures are comparable. In terms of cognate percentages, the Numic-Tübatulabalic figures exceed all others, with the possible exception of those for Tübatulabalic and Takic. Specifically, of 48 plant generics and 74 animal generics available for comparison, Numic and Tübatulabalic share 30 and 32 respectively. In percentages, this is roughly 60% for plants and 41% for animals, or a combined total of 50.5%. Major life forms positions shared include forms for seed, leaf, grass, flower and bird. Intermediates include fish, felines and owls and possibly rabbitbrush (see Chapter V for discussion).

Table 11: Numic - Tübatulabalic Plant and Animal Cognates

Plants	Numic	Tübatulabalic
thistle	*cɨnna	cɨniya-l
elderberry	*kunuk^{w}i	ku.hupɨ-l
Mentzelia	*kuʔa ~ *kuma	ku.l
chia	*pasi	pasi.s-l
willow (large)	*saga-	sa.ha-t
rabbit brush	*sibu^{n}-	si.ba.pul
tule	*sai^{n}-	si.ʔi.bi.l
onion sp.	*siʔi ~ *siwi	si.wi-l
pinenut	*tɨba	tɨba-t
cattail	*toʔi-	toʔi-l
salt grass	*tɨsi-	tu.-t
Ephedra	*tutu^{n}-	u'tu.dul
juniper sp.	*waʔa-	wa.dul
oak sp.	*k^{w}iya	winiya.-l
pine sp.	*woko-	wohombo.-l
carrot	*yampa	yamba-l
willow (small)	*kana (SN)	ha.l
basketry fiber	*sɨʔɨ-	sɨ-l
tobacco mix	*tɨmaya	tu.mayu.t
sego	*sigo	siko.nist
currant sp.	*pogo^{n}-	ʔopo.bo-l (coffee berry)
Lycium sp.	*pici ~ *ʔici	pi.ʔis-t
cane	*paka (SN)	paha.bɨ-l
a cactus	uusi (yucca) (SP)	u.si-l (cholla)
buckeye	paʔasi:bɨ (Kawaiisu)	pa.saʔu-l
medicine sp.	tudunziipɨ (S, NP)	tondonzi-l
jimson	momopɨ (SN)	mo.mo.h-t
alder	pawicu	pawicu.l
seed sp. (?)	soni- (S) (grass)	soʔihih (seed sp.)

Table 11: (Cont.)

Animals	Numic	Tubatalabalic
deer	*tɨʔi	tohi.-l
coyote	*issa	ist
woodrat	*kawa	ha.wa-l
badger	*huna	ʔu.na-l
cottontail	*tabu	tahpun-t
mountain lion	*tuku	tugu.k^{w}ɨ-t
chipmunk	*taba	tapaya-l
skunk	*poni	ponihw
racoon (?)	*pa-takadi	kata.-l
crow	*ata ~ *kata	ʔakapis-t
blue jay	*cai-	ʔazayibis-t
owl	*muʔu ~ *muhu	muhumbis-t
crane, gray	*wasa	wa.sa-l
mudhen	*saiya	sa.ya-l
meadowlark (?)	*hito	ci.do.bilah
dove	*howi	ʔowi-t
buzzard	*wiko	wisokombis-t (song of)
fish	*kuyu, *pa-kuyu	kuyu-l
turtle	*koyo	ko.yo.-t
frog	*waga	wa.ga.is-t
racer snake/water snake	*pasi-ko	pisu-ga.-t (racer snake)
ant	*ani	pa.nɨn-t
quail	*kaka ~ *takaka	taka.h
dog/pet	*pugu	pukubis-t
trout (?)	agai (NP, S)	haʼayal
lizard	sɨgɨpicu (SP)	siko.l
bat	paca (SP, P)	paca.wal
duck (?)	cɨga (SP)	kɨwa.l
wolf	tɨbaci (SP)	tɨbaic
squirrel	sɨkuci (SP)	ʔɨsɨʔɨga-l
2-striped squirrel	ocopicici	picili.t
snake sp.	sɨna (SP) (king snake)	sɨmɨn-t (rattlesnake)

Table 11: (Cont.)

Intermediates	Numic	Tübatulabalic
rabbitbrush (?)	*sibu^{n}-	si.ba-pul
grass	*huk^{w}i	ʔuugibi-l
seed	*puʔi	punzil
leaf	*nanka	naŋkabil
root	wicuna (SP) (potato)	wi.šin
feline	*tuku-	tugu-
owl	*muhu	muhumbis-t
flower	*sɨʔiŋka- ~ *siŋka-	ʔi.ʔibil
Life forms		
tree (?)	*huu- (woody-stemmed plant)	ʔuuʔu-t (cottonwood) (tree)
fish	*kuyu, *pa-kuyu	kuyu-l
bird	*wici	ciki-t

Further examination of the Numic-Tūbatulabalic cognates indicates that several forms not found in Numic generally are shared by one or more Numic language and Tubatulabal. The highest number of shared forms is found between Southern Numic and Tubatulabal. These include for plants, generics for willow, jimson, cane, yucca/cholla, a root sp. (used as a major life form in T), an unidentified medicine, and possibly buckeye (with Kawaiisu only and perhaps a borrowing); and for animals, wolf, two types of squirrels, bat, and possibly bird, lizard, duck and a snake species (see Table 11). Forms shared by Tubatulabal and Central Numic include a medicinal plant, alder, bat (Panamint only) and possibly a grass species and trout. The forms for alder and trout also appear in Northern Paiute (see Table 11).

Lamb (1958a) has also suggested some specific relationships between Southern Numic and Tūbatulabalic, noting that Southern Numic shares "certain structural features with Tubatulabal which are not found in Monachi-Paviotso [Western Numic] nor in Panamint-Shoshoni [Central Numic]." Lamb also cites the glottochronological figures of Swadesh (1954) as further supporting this relationship. These are, respectively: Monachi (Mono) and Ute, 19 centuries; Ute and Tūbatulabal, 29 centuries; Monachi and Tūbatulabal, 35 centuries. Lamb (1958a:99) feels that these similarities may be accounted for by suggesting that the dialect which was to become Southern Numic remained under the influence of Tūbatulabal for some time, while still retaining mutual intelligibility with its sister dialects Western and Central Numic.

Hale (1958), in a more detailed study of Uto-Aztecan internal diversity, adds some new and generally lower lexico-statistical counts. These also support the Numic-Tübatulabalic relationship, although they note a second internal feature for Numic not cited by Lamb. Hale's data suggest that perhaps Central Numic is closer to Tübatulabalic than is Southern Numic. His figures, stated in terms of minimum dates of separation, are as follows: Northern Paiute and Tübatulabal, 3039 years ago; Southern Paiute (Ute) and Tübatulabalic, 2649 years ago; Shoshoni and Tübatulabalic, 2229 years ago and Comanche and Tübatulabalic, 2298 years ago.

Our data tend to confirm both Lamb's and Hale's findings relative to Numic and Tübatulabalic, but do not support Hale's Central Numic-Tübatulabalic relationship. In our sample, more lexical items are shared by Southern Numic and Tübatulabalic than by Tübatulabalic and any other Numic sub-grouping. However, since our data on Panamint and southern Shoshoni plant and animal names are so poor at present, the question of this relationship should probably remain open. It does seem quite clear, given all the data, that Western Numic is the most divergent of the three sub-branches from Tütabulabal. This seems somewhat surprising, given the present geographic proximity of Western Numic-Tübatulabalic speakers on the Sierran slope. The "hot deserts" of Southern California and southern Nevada intervene between Tübatulabal and at least the Shoshoni and Southern Paiute speakers of Central and Southern Numic.

Examination of the referents for the Numic-Tũbatulabalic plant and animal cognates gives some hints as to possible proto-environmental situations.[35] Several of the plants and animals in this set are quite wide-spread in the west [see Hall and Kelson (1959) for distributions of coyote, woodrat, badger, cottontail; Peterson (1961) for dove, crow, crane, coot; and Munz and Keck (1963) and Kearney and Peebles (1960) for rabbitbrush, thistle, willow, tule, cattail, etc.]. However, others are more indicative of specific regions and/or habitats. Chia, lycium and jimson are common "hot desert" plants whose primary distributions do not extend northward into the "cold deserts." Tule, cattail, cane, willows, as well as crane, mudhen and racoon indicate water or marsh situations. Mountain lion, chipmunk, long-needled pine, elderberry, carrot, juniper, pinyon and currant suggest intermediate zone habitats or mountain environments. The entire complex suggests "hot desert" zones in close proximity to foothill and/or mountain environments, not unlike the region in the southern Sierra Nevada occupied by Tũbatulabal-Kawaiisu speakers in historic times.

2. Numic-Hopic Relationships

Table 12 identifies the Numic-Hopic plant and animal cognates. Again, as with Tubatulabal, the forms shared by

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[35]This and other discussions of possible homelands for Proto-Numic are not based on as thorough an examination of distributions for plants and animals as we would like. Although the geographic range of many mammals is known (see Hall and Kelson 1959), less is available for plants. Siebert's (1967) study of Proto-Algonkian homelands by this distributional method serves as a model.

Table 12: Numic - Hopic Plant and Animal Cognates

Plants	Numic	Hopic
sunflower	*akɨ	a:qawu
tansy mustard	*aka	a:sa
thistle	*cinna	tcininga
Ephedra (?)	*tutu^{n}-	3svi
grass sp.	*huk^{w}i	ho:ki
clifferose/bitterbrush	*hɨna-	hu:ŋvi
prickly pear	*nabu	na:vu
rabbitbrush	*sibu^{n}-	sivapi
onion sp.	*siʔi ~ *siwi	si:wi
cottonwood	*soho-	söhövi
oak sp.	*k^{w}iya	k^{w}i:ŋgvi
basketry fiber	*sɨʔɨ-	sɨ:vi
pine nut	*tɨba	tɨva
biscuitroot	*tuna	tumna *Solanum jamesii*
service berry	*tɨwa	tuwavi
ricegrass	*waʔi	le:hu
seepweed	*wata	la:tci
pine sp.	*woko-	löqö
greasewwod (?)	*tono-	te:ve
douglas fir (?)	sana- (S)	salavi
reed	*paka- (SN)	pa:kavi
willow	*kana (SN)	qahavi
dropseed	k^{w}ak^{w}i (SP)	k^{w}ak^{w}e
pumpkin	pataŋ^{w}awupi (SP)	paraŋwaRa
grass sp.	sìhu· (S)	s3h3
rose (?)	*ciʔa^{n}-	teskona
jimson (?)	momopɨ (SN)	cimona
cactus	uusi (SN) (yucca)	ʔö:so (cholla)

Table 12: (Cont.)

Animals

mountain lion	*tuku+	tohow(-t)
wildcat	*tuku	tokoci
badger	*huna	hŏnani
coyote	*issa	ʔi:sawɨ
fox (?)	*wocia	le:tayo
porcupine	*mɨha	mɨ:ŋʷawɨ
gopher	*mɨyɨ	mɨ:yi
mouse	*puʔica	po:sa
rat	*kawa	qa.la
cottontail	*tabu	ta:vo-t
ground squirrel	yɨnazibɨ (WN)	yɨŋʸaya
pet (Domestic animal)	*puku	po.ko
crow (?)	*ata ~ *kata	ʔaŋʷɨsi
dove	*howı	hŏwi
hawk sp.	*kini	ke:le
eagle	*kʷanna (SN)	kʷa:hɨ
owl	*muhu ~*muʔu	moŋʷɨ
buzzard	*wiko	wisoko
horned toad	*maca	maca.kʷa (frog not in water)
fish	*kuyu, *pa-kuyu	pa:kiw
ant	*ani	a:nɨ
mosquito	*wɨpo ~*mɨpo	wɨpacovi
squirrel	sɨkuci (SN)	sakɨna
bat (?)	paca (SN)	sawya
blue bird	ana (WN, SN)	ʔaʔa.t
mudhead duck	cɨga (SN)	cɨkɨ mana (mudhead duck)
blue bird (?)	*cai-	co.ro
hawk (?)	nankaʔi (CN, WN)	natɨ:yawɨ
bird (?)	*wici	ciro-t (little bird)
spider (?)	hukʷampɨ (SN)	ko:kaŋʷ
lizard (?)	sɨgɨpicu (SP)	kɨ:kɨci

Hopi and Proto-Numic are listed first, with those common to Hopi and one or more individual Numic languages following. Positive identification of borrowings is also a problem here. We have attempted to eliminate or otherwise identify those that appear suspicious (see Voegelin, Voegelin and Hale 1962 for phonological data).

As can be seen from the comparisons, Hopic and Numic also show a large number of correspondences. Of 72 plant and 71 animal names for which comparisons can be made, the cognate densities are 31 and 31 respectively (see Table 9). In terms of percentage figures, this is roughly 43% for plants and 44% for animals (Table 10) or 43.5% in combination. Unlike the Tubatulabalic-Numic figures where there is some discrepancy between the relative cognate densities for plants as opposed to animals (see above), the Hopi-Numic counts are approximately the same.

Of the various other counts for Hopi cited in the Tables, only those for Hopic-Tubatulabalic exceed the Hopic-Numic figures (43.5% as opposed to 47.5%). Hale (1958; 1962) also suggests a Hopic-Tübatulabalic-Takic relationship based on glottochronological data and other features of comparative lexicon. He cites figures for Hopi-Cahuilla divergences as 2878 years ago and Hopi-Tübatulabal divergences also at 2878 years ago. He also claims that Hopic, Tübatulabalic and Takic share more of their lexicon with various Sonoran[36]

[36]Hale (1962) considers as Sonoran the following: Cora, Huichol, Tarahumara, Yaqui, Mayo and the various Piman languages.

languages than with Numic (Hopic 15% more, Luiseño-Cahuilla 15% more and Tübatulabalic 6% more). Hale also cites figures on Hopic-Numic relationships: Northern Paiute and Hopi, 2954 years ago; Shoshoni and Hopi, 2725 years ago; Comanche and Hopi, 2504 years ago; Southern Paiute and Hopi, 2740 years ago and Ute and Hopi, 2879 years ago. All of these figures are so close that it seems doubtful that their minor discrepancies have much significance. We must await additional evidence from proto-phonology and comparative grammar before further assessing the situation.

The most striking feature of the Numic-Hopic relationship is the number of forms shared by Southern Numic, and particularly by Southern Paiute-Ute and Hopic. These include various generics, such as the forms for reed, willow, oak, dropseed, pumpkin, cholla/yucca, jimson, bean [an early Uto-Aztecan borrowing, according to Miller (1966)], duck, frog, eagle, and probably also fish, lizard, spider and jimson. Of these, the forms for oak, frog and eagle are of particular interest as the other two Numic sub-branches reflect a competing form: SN *k^{w}iya as opposed to WN and CN *wiya, "oak," SN *pak^{w}a as opposed to CN and WN *waga, "frog," and SN *k^{w}anna as opposed to WN and CN *k^{w}inna, "eagle." In addition, it has been suggested that Southern Numic [maʔábɨ], "plant" and [tɨsɨ́], "herbaceous plant, weed," are related to Hopi [maʔ3vi], an intermediate for desert brush, and [tɨ́:sɨ], "weed, herbaceous plant." Other Numic-Hopic correspondences include for Central Numic, possibly a grass species and turtle (Panamint only), and for Western Numic, gopher.

Given the relative geographic positions of at least Southern Paiute-Ute and Hopi (see Map 3), it may not seem particularly surprising that they should share a number of forms. However, many of these correspondences extend beyond the boundaries of the cultural groups into the remaining Southern Numic areas (Chemehuevi, Kawaiisu). Most of these forms are not found in the other two Numic sub-branches. In addition, it has been noted that the shared forms are not solely in the area of generics, where we might expect relatively easy and effective interchange, but also in the area of intermediates (frog, duck, rabbitbrush) and major life forms (plant/brush, weed). Correlations of this type seem to suggest a longer and more intensive period of contact. When and where it first began is open to question.

Various ethnographic and historic accounts substantiate Southern Paiute-Ute and Hopi contacts over the past two centuries. The Spanish Padre Escalante recorded knowledge of the "people of the blue cloth" (Hopi) among the Shivwits Paiute in 1776 (Euler 1966:34). Southern Paiute also traded with the Havasupai across the Grand Canyon of the Colorado River to the South. The Havasupai were also in contact with the Hopi and knew their characteristics (Spier 1928). One Southern Paiute band was immediately adjacent to Hopi territory (Kelly 1964:167f; Euler 1966:106).

An intriguing set of Southern Paiute-Ute oral traditions also speak of contacts and associations between various Southern Paiute and Ute groups and the prehistoric occupants of pueblo ruins in their territories (Goss 1966; Kayser 1965;

Pendergast and Meighan 1959). Southern Paiute-Ute groups equate the Hopi with these Anasazi groups, designating both as [mok^{w}íci]. Traditions further speak of the withdrawal of the [mok^{w}íci] to the south to occupy present locations on the Hopi mesas. Archaeological studies in northern Arizona also tend to support a southward movement toward Hopi country during Pueblo IV times (1300-1600 A.D.) (see Eggan 1958; Anderson 1969).

Although the evidences from oral traditions and archaeology cannot be taken as proof positive of linguistic movements, or, for that matter, even of affiliations, in view of the Southern Numic-Hopic correspondences, they perhaps merit further attention. If we were to assume that at least some of the Virgin-Kayenta peoples were Hopic speakers, and that they did begin a series of contacts with Southern Numic speakers approaching from the south and west, could we account for the correspondences? Not necessarily. As noted above, most of these extend beyond the Southern Paiute-Ute affiliations into Kawaiisu as well. Either the Ute-Hopi borrowings dating to pueblo contacts were subsequently diffused into Kawaiisu, or we must postulate some earlier historical connections. We will tentatively suggest based on these distributions that Hopi and either the dialect or language Southern Numic were in proximity at some time prior to the internal divergence of Southern Numic. This is placed by Goss (1965; 1966) at roughly 10 centuries ago. We will return to a consideration of where these contacts began in a later section.

3. Numic-Takic Relationships

Before we can consider Numic-Takic relationships, we must first examine the internal features of the Takic grouping, for unlike both Tübatulabalic and Hopic, which consist of single modern languages, Takic is a complex of several languages evidencing varying degrees of relationship. The primary members of Takic for which the data are sufficient for comparisons are Luiseño, Cupeño, Cahuilla and Serrano. Vocabularies are too scant on the other small groupings to provide more than ancillary corroboration (see Miller 1964).

In a paper on the linguistic history of Cupeño, Bright and Hill (1967) consider its relationships with neighboring Luiseno and Cahuilla. They reconstruct some 220 forms for the parent language, labeled Proto-Cupan. All of these forms illustrated show correspondences in each of the three languages. Of these, 34 terms are plant names and plant related forms, and 36 are names for mammals, birds, fish, reptiles and insects. The forms and their referents are as follows:

<u>Plants</u>

*ʔamul, <u>agave</u>; *cay-, <u>mistletoe</u>; *hulaqala (?), <u>buckwheat</u>; *hunavat, <u>Yucca mohavensis</u>; *ʔiyala, <u>poison oak</u>; *kəlawat, <u>wood</u>; *kəlVl, <u>mansanita</u>; *k^{w}inila (?), <u>oak</u> sp.; *maxwal, <u>palm</u>; *mutal, <u>cholla cactus</u>; *nak^{w}ət, <u>sumac</u>; *navət, <u>prickly pear</u>; *nexic, <u>gourd</u>; *pala-, <u>leaf</u>; *panal, <u>Yucca whipplei</u>; *pucila, <u>eye/seed</u>; *pasal, <u>chia</u>; *paʔaq- (?) <u>sunflower</u>; *pivat, <u>tobacco</u>; *qasil, <u>sagebrush</u>; *samVt, grass; *sanat, gum; *sə-, to bloom, flower; *sevela, sycamore; *səyila, reed; *tevat, conifer sp.; *tu-, to bear fruit; *wacic, Artemesia dracunculus; *wavic, foxtail grass; *wiʔa-, oak sp.; *wexet-, pine; *yuyila, spruce; *wiw-, acorn mush; and nettle (irregular).

Animals

*ʔaci(la), pet; *ʔawal, dog; *ʔayamal, racoon; *hunwət, bear (augmentative of badger); *ʔiswət, wolf (apparently augmentative of coyote); *məhɔta, gopher; *paxwut (?), jackrabbit, young; *qawala (?), rat; *qawe...ic (?), fox; *qenic, squirrel; *suqat (?), deer; *suʔic, jackrabbit; *sVkawet, chipmunk or tree squirrel; *tukut, wildcat; *ʔalwVt, crow; *ʔaswət, eagle; *caʔic, blue bird sp.; *laʔalaʔ, goose; *muhuta, owl; *mVxel, dove; *puwi- (?), roadrunner; *qaxal, quail; *tama-wət, mockingbird; ("big mouth"); *yunavic, buzzard; *keyul, fish, *ayily, turtle; *calaka, horned toad; *yu...l, lizard sp.; *paxaʔ, racer snake; *səwət, rattlesnake; *waxa-, frog; *ʔanVt, ant; *mac- (?), tick; *muk^{w}ac (?), flea; *saʔwV-, nit; and *suyila, scorpion (from sting).

An additional check of the literature containing plant and animal names for these three languages (Bright 1968; Hill 1966; Hill 1967; Kroeber 1909; Kroeber and Grace 1960) indicates that we can probably add to this list forms for cottonwood tree, hemp, a chenopod, a type of water reed, mountain sheep, skunk, hummingbird, two species of hawks and yellowjacket. The correspondences and suggested reconstructions are as follows:[37]

Reconstruction	Luiseno	Cupeno	Cahuilla
*ʔava ... Cottonwood	ʔava.xu-t	ʔəvax	lavalvanat[38]
*wica Hemp	wi.ča hemp	wi willow sp. (for string)	wichal milkweed
*qe-t *Chenopodium fremontii* (?)	qe-t *C. album*	qi (wild spinach)	kit, ke-et *C. fremontii*
*paxa (?) water reed	pacxaya-l bullrush	paxa arrowweed	pakhal *Phragmites*
*paʔa- mountain sheep	pa.ʔa-t	paqa	baat
*tuci- hummingbird	tus-ma-l	tuci	dutcil
*k^waʔ- a hawk sp.	k^waʔ-la	k^wavəʔma	q^waʔal
*kisi a hawk sp.	pa.kis-la chicken hawk	kisi	kisil
*sasan- yellowjacket	sa.san-la	səsəʔnimi	sasan-em
*tək^wi- skunk	tukmis-ma-l	tək^wə	tekwil

Comparisons of the Proto-Cupan forms with my transcriptions of Miller's (n.d.) tape-recorded Serrano file, and terms given by Hill (1967) in his Serrano grammar also indicate correspondences in that language with the Proto-Cupan

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[37] These reconstructions follow the suggested correspondences of Bright and Hill (1967). All are tentative.

[38] This form may be a borrowing, as Bright (1967) indicates that initial /l-/ is very rare in Cahuilla.

terms. There are probable cognates for: oak sp., prickly pear cactus, chia, seed, tobacco, grass, to bloom, acorn mush, water reeds, sycamore and possibly yucca, as well as bear/badger, gopher, rat, ground squirrel, deer, mountain sheep, jackrabbit, wildcat, eagle, blue jay, owl, hawk, dove, possibly owl, fish, rattlesnake, horned toad, lizard, frog, ant and yellowjacket. The forms for these (various transcriptions) along with the reconstructed Proto-Cupan forms (Bright and Hill 1967) for comparison, are given in Table 13.

The Serrano data from which these comparisons were made are incomplete. Of the 78 Proto-Cupan plant and animal terms listed, 40, or roughly half show equivalents in the Serrano literature (Hill 1967; Kroeber 1909; Miller n.d.). For the remainder, there are no terms recorded. Of the 40 Serrano forms available, 31 are apparent cognates with Cupan forms, and 9, or roughly 23% evidence differences. If the missing forms were available, we might then expect a fairly high proportion of Cupan-Serrano cognates in plant and animal terminology.

The 9 forms showing marked differences are as follows: <u>wolf</u>, with 3 forms listed (wanat, ko:cac, pa.wahiʔi),[39] <u>dog</u> [k^wiciʔi], skunk [ponyavat], mockingbird [sɨca.ta], hummingbird [pitidiʔi], buzzard [k^wa:'c] (but also <u>condor</u>; see Numic <u>eagle</u>), <u>turtle</u> [kopotɨ], flea [ʔatuʔasta] and possibly

[39]The presence of three terms here may be a reflection of taboos on the name of "wolf" a very important character in religion and mythology in much of Uto-Aztecan and in western North America.

Table 13: Serrano - Proto-Cupan Cognates

	Serrano	Proto-Cupan
oak sp.	k^wiXitɨ ~ k^wiih-t	*kwinila
prickly pear	na:but	*navət
chia	pahinat	*pasal
seed	-puci	*pucila
tobacco	pi:vt	*pivat
grass	haam-t	*samVt
to bloom	sɨi	*sə-
acorn mush	wii:c	*wiw-
water reeds	paxkac	*paxa (?)
sycamore	habo:c	*sevela
willow (large)	haqata	*saXa-t
bear/badger	hunat, hunawət	*hunwət
gopher	mɨ:naht	*məhəta
rat	qa:c	*qawe...ic
ground squirrel	ko:mp t	*qenic
deer	hukw't	*suqat
mountain sheep	paata	*pa?a-
jackrabbit	h^wɨ:'ti	*su?ic
wildcat	tukut	*tukut
eagle	?ahɨnkɨt	*?asw t
blue jay	ceicei?i	*ca?ic
owl	mu:pət	*muhuta
hawk	pakihac	*kisi
dove	maqah^{w}t	*mVxel
fish	kih^{w}uta	*keyul
rattlesnake	ho:nkət	*səwət
horned toad	cilYa:q^wo' (lizard)	*calaka
frog	wakatat	*waxa-
ant	anɨtɨ	*anVt
yellowjacket	ha:nata	*sasan-
yucca (?)	?uwamut ~ ?uumu-t	*hunuvat
crow (?)	qatcauvut	*?alwVt

goose [ʔacokɨta]. There is also an apparent shift in meaning between forms for horned toad in Cupan and lizard sp. in Serrano. Serrano [cil^{y}a:q^{w}o'] lizard sp. (Hill 1967) is the probable cognate of Proto-Cupan *calaka, horned toad. Serrano horned toad is recorded by Hill (1967) as [tipa:'x^{w}oi-(ʔ)ni'], probably a descriptive.

Other correspondences, attested by forms in some but not all of the Proto-Cupan daughter languages as well as in Serrano and other languages in Southern California can also be noted. Some of these are listed in Appendix D with the "strongest" sets starred. Again, as with the Cupan-Serrano list, forms are more often lacking than divergent, so that adequate statements concerning cognates and retention cannot always be made. Although no attempt will be made here to reconstruct possible Proto-Takic forms,[40] visual inspection of these data does seem to suggest that many can be postulated for that period. Bright and Hill (1967) do not provide any dates for time depths in Proto-Cupan, nor does Hale (1958) compute any internal dates for the Takic grouping.

Table 14 gives the Numic-Takic correspondences (based on Proto-Cupan, Serrano comparisons). Starred forms in the Takic column represent Bright and Hill's (1967) Proto-Cupan reconstructions. Those followed by an (S) in parentheses are also found in Serrano. The starred forms in the Numic column are our Proto-Numic reconstructions. Each of the recon-

[40]The Serrano data are too fragmentary and my transcriptions too uncertain. Data on the other Takic languages, most of which are extinct (Kroeber 1907; 1909) are also too fragmentary to be included.

Table 14: Numic - Takic (Including Proto-Cupan) Cognates

Plants	Numic	Takic
tansy mustard	*aca	as-il (Cah)
Lycium (?)	*pici∼ ˀici	?ɨ.ci-s (L)
service berry	*tɨwa^{n}	təwa (Cu)
Ephedra	*tutu^{n}-	tutut (Cah)
elderberry	*kunuk^{w}i	ku.-ta (L)
pinenut	*tɨba	*tevat
tule	*saˀi	*si?i (L)
oak sp.	*k^{w}ia	*k^{w}inila (Sr)
prickly pear	*nabu	*navət (Sr)
chia	*pasi	*pasal (Sr)
sunflower	*pakɨ^{n}∼ ˀakɨ^{n}-	*paˀaq-
pine	*woko-	*wexet
cane	*paka-(SN)	*paxa- (Sr)
hemp	*wiha	*wica
yucca/agave	uusi (SN) yucca	u-a-sil agave stalk
screw bean	k^{w}ini-	qwinyal (Cah)
grass sp. (?)	*waˀa-	wasxa-t (I)
spruce	*yɨwi-	yuyila (L)
willow (large)	*saga-	saxat
juniper	*waˀa-	wa.?a-t (L)
cattail	*toˀi-	te.ˀis (L)
cocklebur/thistle	*cinna	cunala (L)
Animals		
badger	*huna	*hunwət (Sr) bear/badger
wolf	*issa (coyote)	*iswət coyote, wolf
gopher	*mɨyɨ	*məhəta (Sr)
rat	*kawa	*qawe...ic (?)
mountain lion/wildcat	*tuku-	*tukut (Sr)
cottontail	*tabu	tavut (Cah)

skunk	*poni	ponyavat (Sr)
mouse (?)	*pu?ica	pa?in- (Sr)
crow	*?ata-	*?alwVt (Sr)
bluebird	*ca?i-	*ca?ic (Sr)
owl	*muhu	*muhuta (Sr)
crane	*wasa	we.sal (L)
mudhen]	*saiya	say-la (L)
hawk (?)	*kini	*kisi (Sr)
eagle	*k^{w}anna	*k^{w}a- hawk
quail	*takaka *kaka	*qaxa
buzzard	*wiko	pawicokot (Ga) condor
turtle	*?aya	*ayily
fish	*kuyu *pa-kuyu	*keyul (Sr)
frog	*waga	*waxa (Sr)
lizard	yɨnazibɨ-(NP)	*yu...l
ant	*anɨ	*anVt (Sr)
tick	*maca	*mac-
racer snake (?)	*pasi-ko	*paxa?
mouse		*pa?in- (S)
antelope	tɨn.a (NP)	ton-la (L, Ca,
spider (?)	hok^{w}ampɨ (SN)	kuka (L, S
burrowing owl (?)	*kuk^{w}u-	kuku.l (C, L)
squirrel	sɨkuci (SP)	*sVkawət
blackbirds	pakoroba (NP)	paxantc-im (ca)
bird	*wici	wikikmal (Ca) witcit (S
frog	pak^{w}a (SP)	pak^{w}ari-t (L) tadpole
lizard (?)	sɨgɨpicu	sakaron (L) tcaxul-am (Ca)

<u>Intermediates</u>

fish	*kuyu pa-kuyu	*keyul
bird	*wici	wikikmal witcit
flower	*sɨ?inka	səə?
grass (?)	soni- (S)	*samVt

structured sets is followed by the forms shared by individual Numic and Takic languages. All are generics, with the possible exception of fish, spider and frog. The latter, actually reflecting as tadpole in Luiseño only is related to Southern Numic and Hopic *pak^{w}a.

As can be seen from Tables 9-10, Numic and Takic share slightly fewer forms than do Numic and Tübatulabalic and Numic and Hopic. The cognate densities for these sets are stated in terms of Proto-Cupan as well as other Takic-Numic correspondences. For plants, of 20 Proto-Cupan comparisons possible, 8 are found in Numic. Thirteen of 31 other forms also show similarities. For animals, of 40 Proto-Cupan comparisons possible, 20 are shared by Numic. Fifteen of 45 others are also similar. Combined totals are 21 plant cognates of 51 comparisons and 35 animal cognates of 85 comparisons, or, roughly, 40% and 42% respectively.

Glottochronological data are scant for Takic and Numic. Lamb (1958a) cites Swadesh's (1954) Ute-Luiseño figure of 38 minimum centuries since divergence. Hale (1958), again, has consistently lower dates. Based on various computations involving Cahuilla, he gives the following: Northern Paiute and Cahuilla, 3206 years ago; Southern Paiute and Cahuilla, 2802 years ago; Ute and Cahuilla, 3389 years ago; Shoshoni and Cahuilla, 3046 years ago and Comanche and Cahuilla, 2641 years ago. There are some apparent discrepancies in these figures; i.e., compare Shoshoni and Cahuilla vs. Comanche and Cahuilla. Hale's lower dates for Southern Paiute and Cahuilla seems to be in line with our findings, in that Southern Numic, including Southern Paiute, and various Takic languages share several more forms than do Numic and Takic generally (see Table 14). Several of these may be borrowings. Specifically, Southern Paiute and Cahuilla seem to share the greatest number of forms.

In total, Hale's (1958) figures are in keeping with our findings generally. He reports dates of greater time depth for the Numic-Takic relationship than for either the Numic-Tubatulabalic or the Numic-Hopic relationship. We may be able to conclude from this that the plant and animal lexicon is about as sensitive to change as other areas of vocabulary.

Examination of the plant and animal complex involved in the Numic-Takic cognates again indicates a "hot desert" environment, one adjacent to a foothill and/or mountain zone. Chia, prickly pear and tortoise are "hot desert" indicators, while oak, pinyon and long-needled pine and mountain lion suggest intermediate to higher elevations. The water or marsh related complex is not quite as strong here as in the Numic-Tubatulabalic set. Several of these forms are shared by only one Takic language and Numic. It is interesting to note further, however, that Bright and Hill's (1967) Proto-Cupan reconstructions give more emphasis to "hot deserts" than do any of the Numic-northern Uto-Aztecan sets examined thus far. They list agave, *Yucca mohavensis*, cholla, prickly pear, and *Yucca whipplei* in their plant set, as well as roadrunner, mocking bird and scorpion.

4. Hopic-Tübatulabalic Relationships

Table 15 gives the Hopic-Tubatulabalic correspondences and Tables 9-10 summarize the cognate percentages. Of 30 comparisons for plants and 53 comparisons for animals possible between the two branches, Hopic and Tubatulabalic share 17 plant generics and 26 animal generics. In percentage figures, that is roughly 56% for plants and 39% for animals, or a combined total of 47.5%.

As noted above, the Hopic-Tubatulabalic figures appear to be higher than those for Hopic-Numic. Fewer comparisons are possible between the two branches, which may be an influencing factor. The plant cognate densities are also slightly higher than those for animals (56% as opposed to 39%), perhaps indicating some differential replacement rates. However, since Hale (1964) interprets his general lexical comparisons as also tending in this direction, we may not be able to dismiss the possibility of a close relationship without further consideration. Hale (1958) cites 2878 years ago for minimum divergence of Hopic and Tübatulabalic. His figure is slightly higher for Northern Paiute-Hopic (2954 years) and about the same for Ute-Hopic (2879 years). His other Numic dates are slightly lower.

Most of the forms shared by Hopic and Tübatulabalic are also found in Numic, with a few notable exceptions. These include forms for: sego lily, jackrabbit, mountain sheep, screech owl, rattlesnake, a second form for snake, and possibly bumble bee. Of these, the forms for mountain sheep, jackrabbit and rattlesnake are also found in Takic, including

Table 15: Hopic - Tűbatulabalic Cognates

Plants	Hopic	Tűbatulabalic
rabbitbrush	siva:pi	si.bapul
cottonwood (?)	sőhővi	u.ut
onion	si:wi	si.wi-l
sumac/basketry fiber	sɨ:vi	sɨ-l
pinyon	tɨvap-	tɨba-t
cane	pa:kavi	paha.bɨ-l
a grass	ho:ki	ʔu.gibɨ.-l
juniper (?)	le.posi (berry)	waʔa-t wa:dul
cholla	ʔő.so	ʔu.si-l
pine	lőqő	wohombo.-l
alder/birch	palatsp3	pawicu.-l
jimson	cimona	mo.mo.h-t
thistle	tcininga	cɨniya-l
willow	qahavi	ha.-l
sego lily	he:si	ho.zist
ephedra	ʔősvi	utu.dul
flower	sihɨ	ʔiʔibi.l
oak	k^wiŋvi	winiya.-l
Animals		
bear	ho:nawɨ	ʔu.nal
coyote	ʔi:sawɨ	ist
rat	qa.la	ha.wa-l
jackrabbit	sowi	su.ʔi-t
squirrel	sakɨna	ʔɨsɨʔɨga-l
mountain sheep	$paŋ^w$ɨ	paʔat
cottontail	ta.vo	tahpun-t

Table 15: (Cont).

mountain lion	tohow-t	tu.gu.k^wɨ-t
dog	po.ko	pukubist
crow (?)	ʔan^{w}ɨs-t	ʔakapis-t
owl	moŋ^{w}ɨ	muhubis-t
buzzard	wisoko	wisokombis-t song of
screech owl	tokori	tukluluh
rattlesnake	cɨ.ʔa	sɨmɨn-t
snake sp. (?)	ta.ho whip snake	tuha-t water snake
ant	a:nɨ	pa.nɨn-t
dove	hö̆wi	ʔowi.-t
bat	sawya	paca.wal
fish	pa:kiw	kuyu-l
frog (?)	pak^{w}a	waga.is-t
grub	piʔakɨ	piʔa.gɨn-t
bee (?)	momo	to.mo.gal
butterfly (?)	ho.kona	ciko.lolon-t
bluebird	ʔaʔa.-t	ʔazayibis-t
hawk/eagle	k^wa:hɨ eagle	wa.ʔa-l hawk
bird sp. (?)	ciro snowbird	ci.do.bilah meadowlark ciki.-t bird

Proto-Cupan (see Table 16). This may further suggest an early and close association of Hopic with the various languages of southern California (Takic and Tubatulabalic). It is interesting to note that jackrabbit, mountain sheep and rattlesnake, all important forms in Numic culture, reflect divergent forms from these stems cited. We will return to this point when we consider possible homeland proposals below.

5. Hopic-Takic Relationships

Table 16 lists the Hopic-Takic correspondences. Although there are a number, in terms of percentage figures, this is the weakest relationship noted thus far (see Table 9). Of 46 plant comparisons possible, only 15 are shared between Hopic and one or more Takic language. Of 49 animal correspondences, again only 15 are suggested as shared by the two branches. In percentages (table 10), this is roughly 33% for plants and 31% for animals, or a total of 32%.

Hale (1958) computes 2878 years ago as the minimum date of divergence for Hopic and Cahuilla, the only Takic language he treats. This is the same figure he gives for Hopic-Tubatulabalic divergences. He (1964) again suggests on the basis of additional lexical evidence, that the cluster Hopic-Tubatulabalic-Takic may have some validity, as these branches bear a slightly closer relationship to various Sonoran languages than to Numic (see above). Our figures tend not to support the Hopic-Takic relationship. However, since we have not computed densities in the direction of Sonoran, we can neither substantiate nor refute Hale's claims

Table 16 : Hopic - Takic Cognates (*Proto-Cupan)

Plants	Hopic	Takic
oak	k^{w}i:ngvi	*k^{w}inila
prickly pear	na:vu	*navət
sunflower	a:qawa	*paʔaq
tobacco	pi:va	*pivat
pinenut	tɨvap-	*tevat
pine	lőqő	*wexet
cane	pakavi	*paka
bitterbrush	hu:nvi	hun-la (L)
sage, big	wi:k^{w}apɨ	wik^{w}at (Ca)
goldenrod	kaak^{w}ipnga	kak^{w}ɨc (Sr)
thistle	tcininga	canakaʔa (Sr)
jimson (?)	cimona	maniʔic (Sr)
tansy mustard	a:sa	as-il (Ca)
service berry	tuwa	təwa
ephedra	3svi	tutu (Ca)
grass sp.	le:hu rice grass	*wacic foxtail
Animals		
elk	ca.yrɨ	ʔu.cana-t (L)
bear	ho:nawɨ	*hunw t
mountain sheep	pan^{w}ɨ	*paʔa-
deer	sowi?n^{w}a	*suqat
mountain lion	tohow-t	*tuk^{w}et
wild cat	tokoci	*tukut
badger	honani	*hunwət
coyote	ʔis:wawɨ ʔi.ʔis-t	*ʔisw t
gopher	mɨ.yi	*məhəta
squirrel	sakɨna	*sVkawet
cottontail	ta.vo	tavut (Ca)
jackrabbit	sowi	*wuʔic

Table 16: (Cont).

crow	ʔan^{w}ɨsi	*ʔalwVt
owl	moŋ^{w}ɨ	*muhuta
rat	qa.la	*qawala
rattlesnake	cɨ.ʔa	*səwət
frog	pa.k^{w}a	pak^{w}ari-t (L) tadpole
snake sp.	ta.ho, tataho-t	tataxul (Ca)
lizard sp. (?)	kɨci?pɨ	qasï-la (L)
ant	a:nɨ	*ʔanVt
fox (?)	le:tayo	*qawe...ic
mouse	pö:sa	wapaxval (L)
wolf	k^{w}ew	k^{w}ʉciʔi (Sr)
hummingbird	to.ʔca	*tuci
bluebird	ʔaʔa	*caʔic
hawk	ki:sa	kisi (Cu, Ca)
eagle/hawk	k^{w}a:hɨ	*k^{w}aʔ- (Ser)
fish	pa:kiw	*kəyul, (Sr)
spider	ko:kaŋ^{w}	kukat (Sr,L)
louse	atɨ	ʔacumpɨcɨ ʔatuʔasta flea

with reference to these southern relationships.

Again, with reference to the specific forms in the Hopic-Takic lists, some interesting features emerge. Here we encounter for the first time a shared form for tobacco. This is apparently an old Uto-Aztecan stem (Voegelin, Voegelin and Hale #12, $pi_s pa$). Also, the forms for mountain sheep, rattlesnake and deer appear to be of some antiquity. They are divergent from present Numic stems for the same forms. We also find two additional forms for types of desert brushes not shared by Numic. These are stems for big sagebrush Artemesia tridentata) and a second for a smaller goldenrod/sage (see Table 16). The form for big sagebrush is found in Luiseño, Cahuilla and Hopi, while the form for goldenrod/sage appears only in Serrano and Hopi.

6. Tübatulabalic-Takic Relationships

Lastly, Table 17 lists the shared forms between Tubatulabalic and Takic. Of 36 plant comparisons possible, the two branches share 16 or roughly 43%. Of 47 animal comparisons possible, they share 30, or roughly 63%. The combined total in terms of percentage of shared forms is 53%. This relationship is the highest recorded among the various sets compared. Hale (1962) also computes a low figure for minimum years of divergence for Tubatulabalic and Cahuilla: 2229 years ago.

Of the various forms shared, only manzanita and agave appear to be widespread and unique to this set. Both are reconstructed for Proto-Cupan (see above), and neither evidences a Numic cognate. A few other forms are shared by

Table 17: Tübatulabalic - Takic Cognates

Plants	Tübatulabal	Takic
mansanita	kɨ.na-l	*kəlVl
chia	pa.si-l	*paṣal
pinyon	tɨba-t	*tevat
agave	ʔumu.bɨ-l	*ʔamu-l (S)
oak sp.	winiya-l	*kʷinila
pine sp.	wohombo.-l	*wexet
wild rhubarb	aba.nal	aval-wu-t (L)
thistle	cɨniya-l	cuna.-la (L, Ca)
elderberry	ku.hupɨ-l	kuʔut (L)
cane	paha.bɨ-l	pakhal (Ca)
willow (large)	sa.hat	ṣaxa-t
tule	siʔi.bi.l	siʔi
cattail	to.ibɨ.l	te.ʔi-s (L)
juniper	wa.dul	waʔa-t (L, Ca)
ephedra	u'tu.dul	tutut (Ca)
Animals		
coyote	ist	*iswət
bear	ʔu.na-l	*hunwət
rat	ha.wa-l	*qawala
jackrabbit	su.ʔi-t l	*suʔic
mountain sheep	pa.ʔa-t	*paʔa-
mountain lion	tu.gu.kʷɨ-t	*tukut wild cat
squirrel (?)	ʔɨsɨʔɨga-l	
cottontail	tahpun-t	tavut (Cah)
chipmunk/mouse	tapa.ya-l	tapas-ma-l (L) mouse
skunk	ponihʷ	ponyavat (Sr)

Table 17: (Cont.)

crow	ʔakapis-t	*alwVt
eagle	a.sawɨ-t	*ʔaswət
owl	muhumbis-t	*muhuta
blue jay	ʔazayibis-t	*caʔic
valley quail	takah	*qaxal
crane	wa.sa-l	we.sa-l (L)
buzzard	yoʔolapɨ.n	*yunavic
meadowlark	u.sa-l	ʔisa.-l (L)
woodpecker	culus-t	so.-la (L)
bird sp.	tu.ga.yaya.-l	toxavi̦
screech owl	tukluluh	tukyapa-l
hawk sp. (?)	wa.ʔa-l	ma.xwa-la (L)
mudhen	sa.ya-l	say-la (L)
rattlesnake	sɨmɨn-t	*səwət
fish	kuyu-l	*keyul
turtle	ko.yo.-t	kopot (Ser)
frog	wa.ga.ɪst	*waxa-
ant	ʔa.nɨ̦n	*ʔanVt
fly sp.	pico.gɪs-t	picucut (Ser)
louse	naha.-l	ʔaləʔ (Cu,L)

Tubatulabalic and a single Takic language, perhaps evidencing borrowings. All others are either suggestive of Numic and/or Hopic relationships as well.

B. Proto-Numic Homelands

The data presented in the preceding section on inter-branch relationships have various implications for the culture history of the Proto-Numic speakers and for the other northern Uto-Aztecans as well. As can be seen from our discussion of cognate percentages and glottochronological counts, Numic, Hopic, Tũbatulabalic and Takic are all rather closely affiliated. Glottochronological counts place the internal divergence of the grouping at somewhere in the vicinity of 3,000 years ago. However, there are also some interesting hints of slightly closer relationships between some branches and sub-branches, notably between Numic, and particularly Southern Numic, and Tũbatulabalic, Numic and Southern Numic and Hopic, and Hopic and Tũbatulabalic. We will now attempt to systematize these relationships by examining more closely the plant and animal complexes shared by all branches and suggesting a specific homeland proposal.

Table 18 summarizes the data on plant and animal cognates shared by three or more of the four northern Uto-Aztecan language branches. Of these various forms 22 are found in all branches. These are: thistle, prickly pear, cane, pine, oak, ephedra, pinyon, badger, coyote, woodrat, wildcat, squirrel, mouse, cottontail, crow (?), owl, eagle/hawk, buzzard, screech owl, an unidentified bird, and fish. Of these,

Table 18: Numic - Tübatulabalic - Hopic - Takic Correspondences

Name	Numic	Tübatulabalic	Hopic	Takic
thistle	*cinna	cɨniya-l	tcininga	cun.ala (L) cuna (Cu) canakaʔa (S)
elderberry	*kunuk^{w}i	ku.hupɨ-l	-	ku.ta (L) kuʔut (Cu) Kuuhuutɨ (S)
chia	*pasi	pasi.s-l	-	*paṣal (S)
sunflower	*pakɨ *ʔakɨ	-	a:qawu	*paʔaq
rabbitbrush	*sibu^{n}-	siba-pul	sivapi	-
cactus prickly pear	*nabu	-	na:vu	*navət (S)
cane	*paka	paḥa.bɨ-l	paɨkavi	*paxa (S)
Lycium	*pici *ʔici	piʔis-t	-	ʔɨ.ci-s (L)
grass (a)	*huk^{w}i-	ʔuugibəə-l	ho:ki	
grass (b)	sihu (S) ?	-	s3h3	*samVt (s)
weft material	*sɨʔɨ	sɨ-l	sɨ:vi	-
willow	*kana	ha.-l	qahavi	-
pine	*woko	wohombo.-l	lŏqŏ	*wexet
oak	*wiya *kwia	winiya	k^{w}i:ngvi	*wiʔa (S) *kwinila (S)
juniper	*waʔa	wa.dul	-	waʔat (L) iswat (Ca)

Table 18: (Cont)

Name	Numic	Tübatulabalic	Hopic	Takic
ephedra	*tutu^{n}-	u'tu.dul	ʒsvi ~ ösvi	tutut (Ca)
pinenut pinyon	*tɨba	tɨba-t	tɨva	*tevat
onion	*si?i	si.wi-l	si:wi	-
tobacco	-	-	pi:va	*pivat (S)
cattail	*to?i	to.ibɨ.-l	-	te.?is (L,Cu)
tansy mustard	*aca	-	as:a	as-il (ca)
service berry	*tɨwa	-	tuwavi	təwa (Cu)
hemp	*wiha	-	-	*wica
tule	*sain- *saki	si?i.bi.l	-	si?i (Cu)
bitterbrush/ cliffrose	*hɨna	-	hu:nvi	hun-la (L) henily (Ca)
seepweed	*wada	-	la:tci	-
cottonwood	*soho	u.ut (?)	söhövi	-
cholla	uusi (SP)	?u.si-l	?ö.so	-
Animals				
badger/bear	*huna	?u.nal	honani	*hunwət
wolf/coyote	*issa	ist	?i:sawɨ	*iswət
gopher	mihɨ (NP)	-	mɨ.yi	*məhəta (S)
woodrat	*kawa	ha.wa-l	qa.la	*qawala
jackrabbit	-	su.?i-t	sowi	*su?ic

Table 18: (Cont.)

Name	Numic	Tübatulabalic	Hopic	Takic
wildcat/ mountain lion	*tuku	tugu.k^{w}ɨt	tokoci tohow-t	*tukut
deer (a)	*tɨʔi	tohii tɨ-sib (deer hide)		
(b)			sowiʔn^{w}a	*suqat
fox (?)	*waciʔa	-	le:taya	*qawe...ic
squirrel	sɨkuci (SN)	ʔɨsɨʔɨga-l	sakɨna	*sVkawet
squirrel	*kɨ^{n}pa	-	-	*qenic
bat	*paca	paca.wai	sawya	
mouse	*puʔica	-	po:sa	paʔa-s (L) paʔist (S)
cottontail	*tabu	tahpuhun-t	ta.vo-t	tavut (Ca)
skunk	*poni	ponihw	-	ponyavat (S)
mountain sheep	-	pa.ʔa-t	pan^{w}ɨ	*paʔa-
chipmunk	*taba	tapa.ya-l	-	tapas-mal (L)
bluebird	*cai	ʔa.zayibis-t	-	*caʔic
crow	*ata *kata	ʔakapis-t	ʔan^{w}ɨsi (?)	*alwVt
owl	*huʔu *muhu	muhumbis-t	mon^{w}ɨ	*muhta
heron	*wasa	was.al	-	we.sa (L)
mudhen	*saiya	sa.ya-l	-	sayla (L)
hawk	*kini	-	ki:sa	*kisi

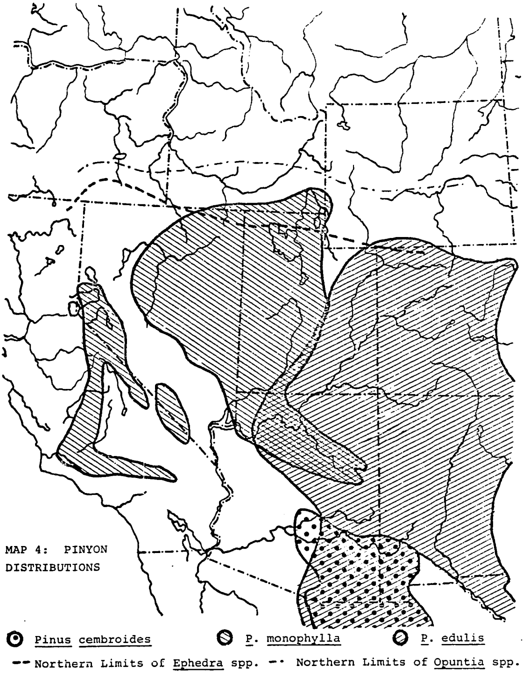
Table 18: (Cont.)

Name	Numic	Tübatulabalic	Hopic	Takic
eagle/hawk	*k^winna *k^wanna	wa.ʔa-l hawk	k^wa:hɨ	*k^wa hawk
buzzard	*wiko	wisokombist yoʔolapɨn	wisoko -	pawicokot (Ga) *yɨnavic
quail	*kaka *takaka	takah	-	*qaxal
screech owl	-	tukluluh	tokori	tukyapa (L)
dove	*howi	-	höwi	
bird	*wiki	ciki-t	ciro-t (?)	wikikmal (Ca) wikat (S)
burrowing owl	*kuku	-	-	kuku.l (Ca, L)
fish	*kuyu	kuyu-l	pa:kiw	*keyul
turtle/tortoise	*koyo *aya	ko.yo-t -	yöŋösona (?) -	*ayily
frog	*waga pak^wa- (SN)	wa.ga.ist -	- pak^wa	*waxa pak^wari-t (L)
spider (?)	hukwampɨ (SN)		ko:kan^w	kula (L), (S)
tick	*mata	-	-	*mac-
lizard (?)	sɨgupicu (SN)	siko-l	kɨ:kɨci	*yu...l
ant	*ani	ʔa.nin pa.nɨn-t	a:nɨ	*anVt
grasshopper/larvae	*woʔa	-	-	wöʔöh-t (S)
louse	*poci	-	pesecʔola	-

10 evidence yet broader Uto-Aztecan distributions, according to the data gathered by Miller (1967), supplemented by my reevaluation of the published literature. These 10 are: thistle, prickly pear, cane, pine, wildcat, mouse, buzzard, screech owl, bird, and fish. Several forms listed in Table 18 are also found more widely, including tobacco, grass (b), deer (b), crane, turtle (a), snake (a) and grasshopper/larvae.

Assuming that the above forms represent valid cognate relationships, we can now examine them more closely as possible proto-environmental indicators. This examination lacks desired exactness, in that biologists have not provided adequate data to date on the geographic ranges of all pertinent forms.[41] Data are fairly accurate for ranges of trees and certain shrubs and for mammals, but other forms are less well known. However, utilizing what is available, we can make the following generalizations: 1) based on the distributions of pinyon, prickly pear and ephedra (see Map 4), that the homeland area lies somewhere to the south of about 41° No. Lat., which marks the northern limits of these forms (Munz and Keck 1963; Shelford 1963; Steward 1938); 2) based on the distribution of turtle/tortoise from the maximal set, and chia, lycium and cholla from the remaining forms in Table 18, that the homeland was probably also south of about 36°3o' No. Lat., which marks the northern limits of the "hot deserts;"

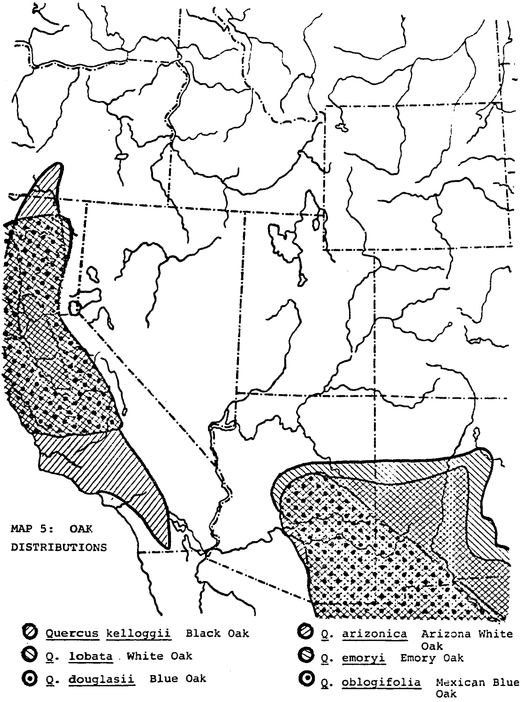
[41]See Siebert's (1967) study of Proto-Algonkin homelands for an illustration of the techniques of proto-environmental reconstruction involving distributional mapping.


MAP 4: PINYON
DISTRIBUTIONS
Pinus cembroides
P. monophylla
P. edulis
Northern Limits of Ephedra spp.
Northern Limits of Opuntia spp.

and 3) that environmentally, the homeland area must have been diverse as to elevation, allowing for stands of pine, pinyon and oak, as well as desert and lowland forms. Based on the presence of proto-forms for cane, crane, heron and fish, it must also have contained streams and/or marshes.

Given these various indications, we can now examine some possible areas where these conditions are optimally reflected. The distribution of oaks becomes particularly pertinent to this discussion. At present, oaks are found in concentration in proximity to deserts and mountains only in two major western areas; e.g., in the Sierra Nevada and its foothills in California, and in the White Mountains and areas immediately to the south in southeastern Arizona and northern Mexico (see Map 5). Smaller scrub oaks also occur in parts of central Arizona and central Utah, but were rarely the focus of any aboriginal economic attentions (Kelly 1964; Whiting 1939). Palynological evidence for southeastern Arizona (Martin 1963) indicates no significant changes in oak distributions in that area in the more recent past, although there may have been some shifts in boundaries as early as 9,000 years ago. Comparable evidence is lacking for southern California, although data for the adjacent Mohave Desert suggest no major changes in the past 5,000 years. We can thus assume, at least for the present, that the ranges for oaks as stated should have been characteristic of the period roughly 3,000 years ago.

Amplifying the information provided by the distributions of oaks with data provided for pines and pinyons


MAP 5: OAK
DISTRIBUTIONS
Quercus kelloggii Black Oak
Q. lobata White Oak
Q. douglasii Blue Oak
Q. arizonica Arizona White Oak
Q. emoryi Emory Oak
Q. oblogifolia Mexican Blue Oak

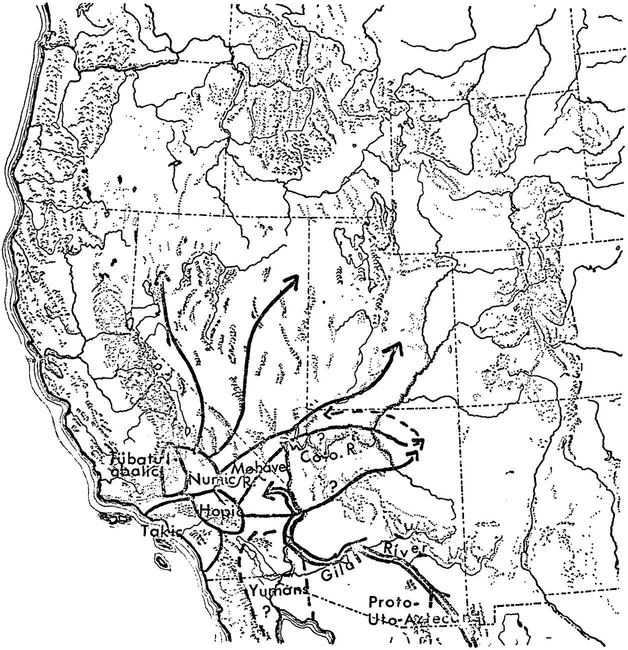
(Preston 1966; see also Maps 4, 5), we find the same two areas indicated; e.g., the southern Sierra Nevada in California and the mountainous and foothill zones of southeastern Arizona and northern Mexico. Further consideration of the other forms given in Table 18 does not lead to any other noticeable distinctions between them. As both areas are in the immediate vicinity of desert zones (the Mohave in the north and the Sonoran in the south), both contain forms such as chia, lycium, seepweed, cholla and tortoise. General descriptions of the physiography, vegetation and hydrology for each area provided by compilations from Munz and Keck (1963) and Jaeger (1960) for southern California and Kearney and Peebles (1960) and Martin (1963) for southeastern Arizona suggest additional points of similarity. We thus have two possible homeland areas indicated by the lexical data, one in the southern Sierra of California and the other in southeastern Arizona and northern Mexico.

That both areas are suggestive of homeland locations may not be particularly surprising, given previous attempts at Uto-Aztecan linguistic paleontology. After a preliminary examination of plant terminology, Romney (1957) also concluded that the Arizona-Sonora border area might have been a possible homeland for all of Uto-Aztecan. We could in fact be dealing with two homeland regions, one in southeastern Arizona-Sonora as an early homeland of Uto-Aztecan, and a second area of secondary dispersion for certain of its branches in southern California. The position of Hopi with respect to these two areas should be of particular interest;

e.g. did Hopi separate from the other Uto-Aztecan branches in southeastern Arizona, or in southern California?

As has been the case with our previous considerations, questions concerning specific problems of language and culture history must often be answered with data from outside the area of immediate concern. In that the oaks seem to be significant distributional indicators, we examined additional published sources on the Sonoran languages of Uto-Aztecan (Pima, Papago, Tarahumara, Cora, Huichol, Tepecano, Tepehuan) for terms for these forms. None of the Sonoran languages suggests a cognate for the forms for oak shared by Numic, Tubatulabalic, Hopic and Takic (see Proto-Numic *k^wia, *wiya in Generics, Chapter V, and in Table 18). The most common stem in the Sonoran languages appears to be related to Pima/ Papago [tua] (also in Cora, Huichol, Tepehuan, Tepecano). This suggests a discontinuity in the terms for oaks that may indicate that the northern languages form one cluster for this feature and the southern languages another. The northern branches also share the terms for pinyon (*tɨpa) not found in the others. This may further indicate that Numic, Tubatulabalic, Takic and Hopic dispersed at least at some period in the past from a different area containing oaks than did the Sonoran groups. We suggest that this is the case, and that the area of dispersal for the northern groups was in the vicinity of the southern Sierra Nevada, in the foothill areas above the Mohave Desert (see Map 6).

This suggestion supports Lamb's (1958a) hypothesis of southern California origins for Proto-Numic, with the follow-



═══ Early Northern Uto-Aztecan Migrations (ca. 5,000 years)

——— Later Northern Uto-Aztecan Migrations (ca. 3,000 years)

MAP 6: PROTO-NUMIC HOMELANDS

ing exceptions: 1) that we would place the area of dispersion to the west of Lamb's Death Valley locus, to take advantage of the maximum distribution of the various oak species; and 2) that we would go beyond Lamb's proposal and include the Hopic speakers as also sharing this location in the past --presumably around 3,000 years ago. Additional data that tend to support this contention are the distributions of the lexical forms for rattlesnake, mountain sheep and jackrabbit (see Hopic-Takic Relationships, above) as well as fish (see Chapter V) and the use of the intermediates rabbitbrush, herb and perhaps also plant/brush by Hopic and Southern Numic speakers.

Whenever proposals of this type are considered, the question of borrowing must necessarily enter into the discussion. As noted by Swadesh (1959), and in Chapter II above, the Uto-Aztecan languages may represent a classic case of the mesh principle in maximal effect. Certainly with reference to Numic, all of the socio-cultural factors facilitating exchange are built into their aboriginal situation. We have also noted with reference to Hopic-Southern Numic interrelationships, that there may have been some more specific periods when interchange was facilitated. In addition, given the quality and quantity of the phonological data at hand, we cannot reasonably rule out the possibility that the terms for oak shared by Hopic and the other northern Uto-Aztecan languages, and the terms for mountain sheep, snake, jackrabbit and other forms shared by Hopic, Takic and Tubatulabalic are not the result of inter-language borrowings at some later period. However, given all of the evidence, we still feel that it is probably significant that Hopi shares these forms with the other northern Uto-Aztecan languages and not with those to the south. We thus suggest that the Hopi were also in the southern California homeland area at some period prior to major dispersals by the Numic, Tubatulabalic and Takic speakers.

In order to further account for the lexical distributions and the various cognate percentage differences within the languages of this northern grouping, we can expand on Lamb's discussion of the probable linguistic conditions in the homeland area (see Chapter II). Lamb (1958a) suggests that about 3,000 years ago, the area near Death Valley (which we now shift slightly to the west), may have been characterized by a set of mutually influencing dialects. Among these were the newly emerging Numic dialects (presumably those that would give rise to the branches Western, Central and Southern) and Tubatulabalic. We would add here that in all likelihood, Hopic and various Takic dialects were also present in the region as well. All of these groups may have ultimately dispersed from a southeastern Arizona-northern Sonora homeland at some time prior to this period, perhaps following natural water courses such as the Salt and Gila rivers, the Colorado, and even the partially dry Mohave. Upon reaching the Sierra foothills, their distribution pattern may have been like that given in Map 6, with Tübatulabalic and Takic to the west and Numic and Hopic to the east. We would also place Southern Numic in close proximity of both Hopic and Tübatulabalic.

Soon after 3,000 years ago, the various dialects began to develop more distinctive features. Hopic speakers may even have begun to disperse either across the deserts of southern California and the Colorado River and into the Arizona plateau, or north and eastward skirting the right bank of the Colorado. Upon arriving in Arizona, they also ultimately adopted maize agriculture, probably from groups already in position. Miller (1966:100) also concludes, based on the lack of cognate terms for corn in Hopi and the Sonoran languages, that the Hopi were probably non-agricultural when they arrived in northeastern Arizona. He notes that "it is probably not coincidental that the Hopi and their Sonoran cousins do not share the word for "corn," and that the earliest races of corn in the Anasazi and Sonoran areas are not the same."

By 1 A.D., according to Lamb (1958a), Tübatulabal and Numic were distinct, and Numic speakers may have been beginning to disperse northward. Southern Numic may have remained in proximity to Tübatulabal for some time longer, thereby accounting for the higher number of cognate lexical items and grammatical features shared by these two groupings. By about one millenium later, all Numic branches were beginning to show dialect divergences, into the units that would ultimately develop into the pairs of languages that each branch now displays. Also at about this time, the northernmost Numic dialects were beginning a fairly rapid northward expansion into the Great Basin, probably also following the natural geographic corridors provided by the region. The Western

Numic speakers spread along the Sierran uplift into west-central Nevada and beyond, the Central Numic speakers followed the north-south trending Basin ranges into the central area of Nevada, and the Southern Numic speakers followed the Colorado river and its tributaries on the east. In particular, the historic distribution of the Southern Numic speakers parallels rather closely the major right bank tributaries of the Colorado River system, in both the Basin and Range and the Colorado Plateau (see Map 6). The Southern Numic speakers probably again contacted the Hopi, who by this time were fully agricultural and living in the Virgin-Kayenta region. The northern and eastward expansion of the Southern Numic speakers may have in part accounted for the withdrawal of the pueblo agriculturalists to the south and east.

Whether the proximity of bison in the Great Basin was the impetus for Numic expansion as Lamb (1958a) suggests, cannot be ruled out based on the evidence cited earlier (see discussion, Generics, Chapter V).

C. Summary

In the foregoing chapters, we have attempted to demonstrate the utility of historical investigations of entire semantic domains to problems of culture history. We have attempted to trace the growth and development of a particular semantic system--that of the biotaxonomies of plants and animals--in a number of closely related languages forming the Numic branch of Uto-Aztecan. We have suggested that these schemes in Numic are based on recognitions of actual continuities and discontinuities in nature, and that they are also environmentally, culturally and historically conditioned. We have further suggested that studies of the growth and development of systems in ethnobiology can give added clues to the specifics of culture history for these various groups, including some important language branch connections, original homelands and processes of internal divergence. From this study, we concluded that the Numic speakers, and their immediate linguistic relatives, the Hopi, Tubatulabal, Luiseno, Cahuilla, Cupeno and Serrano and others, once occupied adjacent areas in the southern Sierra Nevada of California. From this area, they gradually spread northward and eastward, retaining certain semantic features of their ethnobiological systems as well as a number of specific lexical forms. They also maintained certain contacts with adjacent branches and sub-branches that affected the subsequent development of these patterns of biotaxonomic nomenclature. The Numic systems as they occur today, are thus the result of an interplay of all of these environmental, cultural and historical features.

In spite of certain limitations that may be inherent to the methods of historical semantic studies of domains such as ethnobiology, we thus conclude that studies that attempt to account for the origins of the organizational principles of such systems as well as for the lexical forms themselves, can make contributions that go beyond other culture-historical and linguistic studies. Methods that combine the two approaches within the framework of semantic domain research need many additional refinements and added substantiation, but they should ultimately prove to be of considerable value.

APPENDIX A

VISUAL CRITERIA AND THE DEFINITION OF NUMIC GENERICS

During the course of these investigations, I was continually struck by the logic of native observations when dealing with and naming native generics. This can be illustrated by several examples of Numic and Proto-Numic vs. modern taxonomic classification. Correlations between the two systems need not be, and often are not, isomorphic, yet the parallels are striking and very interesting.

The Proto-Numic generics *tonca (Set III) and *tunna (Set I) are examples of native generics that are more specific than a modern taxonomic genus. The reflected forms of both are members of the same botanical genus _Lomatium_ (_L_. _dissectum_ var. _multifidum_, and _L_. sp., either _L_. _macrocarpum_ or _L_. _nevadense_, or both). Popular names are "Indian balsam" and biscuitroot, also a clue to their distinctiveness. Close examination of the forms in question yields many points of difference. Biscuitroots are low-growing, or prostrate forms with puffs of closely spaced white to pinkish flowers. They appear in early spring, and were an important focus for native food gathering activities. By mid-summer, their foliage has disappeared. Indian balsam, in contrast, is a tall herb (ca. 8-14 dm.), has widely-spaced flower clusters born on the terminal ends of the umbel, and is observed for much of the summer season. Its root was gathered in the fall as an important medicine. It was considered a "cure-all" with many uses, and is still found in many Indian households today.

Botanists appear to have had some difficulty in placing Indian Balsam taxonomically in the past. According to Munz and Keck (1963:1026), it and several closely related forms were formerly considered to constitute a separate genus, Leptotaenia. The entire genus Leptotaenia has now been merged with Lomatium, comprising three of its many western species. The resulting genus Lomatium is thus quite heterogeneous visually. The Proto-Numic and Numic generics retain the earlier classification.

The Proto-Numic generic *hɨna- (Set I), as opposed to the generics *tonca and *tunna, seems to be an example of a form that is more inclusive than a modern botanical genus. Its present-day Numic referents reflect either the genus Purshia, popularly bitterbrush, or Cowania, popularly cliffrose, or both (P. tridentata and C. mexicana var. stansburiana, respectively). Close examination of the forms in question yields many points of similarity. Both forms resemble each other in general features of leaf shape, size and color (leaves small, often trident, dark green above, light beneath). They are also similar in general features such as branching and in overall size (both vary from 1-3 m., according to Munz and Keck 1962:780). Both occur in valley and mountain habitats, although Cowania seems to be confined to higher elevations in parts of the Great Basin region, where it also attains a greater height than Purshia. Both genera have overlapping geographic distributions in much of the southern Basin. Both Purshia and Cowania belong to the same botanical family (Rosaceae). Neither genus is particularly diverse, at least in western North America. Both genera were used for similar medicinal purposes by Great Basin groups. The bark of Cowania, which is shreddy, was also used for clothing by the Southern Paiute.

Cowania and Purshia appear to contrast visually primarily in the flowering season. The flowers of Cowania are pale yellow, highly fragrant and multi-petaled, often resembling single roses; hence the popular name "cliffrose." Those of Purshia are smaller, more profuse and generally darker in color. Thus, except for this feature, the genera reveal many more similarities than differences. That they should be considered as members of a single Numic and Proto-Numic generic is not surprising.

Numerous other examples can also be cited for both plants and animals. In each case, visible morphology is given a great deal of consideration by native taxonomists. However, even though it is a primary base, use continues as the prominent feature of all systems, giving orientation to the patterns of nomenclature.

APPENDIX B

PROTO-NUMIC COGNATE SETS IV:

WEAKLY REFLECTED FORMS

Following are the cognate sets that are the most weakly reflected in Numic and the other Northern Uto-Aztecan languages. They either lack sufficient distributional evidence to allow their inclusion in Sets I, II and III (see Chapter V), or they are suspected borrowings. Several are found in pairs of adjacent languages only.

A. Plants

Manzanita	adadampibɨ (S, K, SP, U). Adjacent languages only.
<u>Chenopodium</u> sp.	ɨapɨ (NP, S, P,). Probably from verb "to plant." Adjacent languages only.
Clover	pozidapɨ (NP) and possibly pa:ziwatsu-bbɨ (K). Southwestern Basin languages only.
Tobacco	puibahmu (NP, M, S, P). Adjacent languages only. Also second stem k^wo?apɨ or sag^{w}ak^{w}oapɨ (SP, U) and possibly a third soˀodɨ (K). Yokuts loan?
Chokecherry	toˀnambi (S, SP). Adjacent languages only.
Fir (?)	kataabi (NP, K). Adjacent southwestern languages only.
Lupine	k^widak^{w}anna (NP, S). "Feces smell" Adjacent languages only.
Moss	payogapɨ (M, NP, S). Adjacent languages only.
Biscuitroot	haapiˀi (NP, S). Adjacent northern languages.

Mushroom	hitoʔo (K, SP, P, S, M?). May be found to be cognates on additional distributional evidence.
Biscuitroot	hunibui (NP, S). Northern languages only.
Birch	huuzabɨ (NP, S). Northern languages only.
Grass	sonipɨ (M, S). M form /sona/ "hay" may be borrowing.
Atriplex ?	sunu (NP, S). S form is for <u>Atriplex confertifolia</u>; NP form is for <u>Agropyron</u> spp.
Grass	sihu (S). H form s3h3 may be related.
Cholla	uusi (SP). H. form 3s3 may be related. SP form is for narrow-leafed yucca.

For other weakly reflected plant forms see various Tables, Chapter VI.

B. Animals

Mountain sheep	various forms may reflect word taboos.
Antelope	tɨn.a (NP) and also in various Takic languages. wanci (S, SP) a second form in adjacent languages.
Horse	Various forms including extensions of terms for "pet (NP, S), Spanish loans.
Bear	Various forms may reflect word taboos.
Wolf	Various forms may reflect word taboos.
Ground hog	yaha (S, SP). Adjacent languages only. WN form differs.
Ground squirrel	ʔehk^{w}ɨ (M)(K), ʔik^{w}ɨ (NP); aq^{w}isic (U); irregular and may be borrowing.
Field mouse	pamotoʔo (NP, S). Adjacent languages only.

Bat	paacaci (SP, P) Adjacent languages only.
Turkey	See Table 2. S, C. SP and U forms may be related. If so, this set could be of considerable interest.
Red-tailed hawk	nakaʔi (NP). See also SP form, Table 3, and Set III.
Duck	pɨhɨ (M, NP, P, S). SP, K, form differs.
Junco (?)	tohʔna (M), toogo (SP).
Mocking bird	muciʔuoina (M), musigaici (SP).
Lizard	pogo- (M, P, S). Adjacent languages.
Salmon	agai (M, NP, S). Adjacent languages.

For other weakly reflected animal forms, see various tables, Chapter VI.

APPENDIX C

A PROTO-UTO-AZTECAN GENERIC FOR "TREE?"

In his paper "Speculations on the Growth of Ethnobotanical Nomenclature," Brent Berlin (1972) suggests that life form names often originate in the elevation of culturally significant generics. Although we have generally concluded in this thesis that there probably was not a well developed life form "tree" in Proto-Numic, certain other data in Uto-Aztecan may suggest another interpretation in line with Berlin's hypothesis.

In the course of general investigations into the life form names for "tree," we examined the literature on much of Uto-Aztecan for a possible generic precursor for Proto-Numic *huu, "stick, plant, tree." This examination yielded a limited number of possible candidates for early Uto-Aztecan tree generics, of which the most widely distributed are the dual forms for pine, summarized by Miller (1967) as *woko (UAC #320a) and *hoko (UAC #320b). At first examination, the two forms appear to have mutually exclusive distributions in the various languages, thus suggesting that they are variants of the same stem. Their distributions are as follows: *woko, in Numic (see Proto-Numic *woko, above), Tübatulabalic (wohomboo-l, 'bull pine'), Hopic (löqö, ponderosa pine), Varahio (wohko, pine), Mayo (wokko, pine) and Yaqui (woko, pine); *hoko, in Northern Tepehuan (ukui), Southern Tepehuan (huk), Tarahumara (ʔoko), Cora (huku), Huichol (huukuu) and Mejicano or Aztec (okoo-t). However, the possibility that Hopi may reflect both *woko (löqö) and *hoko (see ho-qölö, 'juniper') forces closer examination of all forms.

According to the data presented by Voegelin, Voegelin and Hale (1962), and summarized by Miller (1967), the Proto-Uto-Aztecan vowels *u and *o have various representations in the modern Uto-Aztecan languages. Proto-Uto-Aztecan *o is reflected as /ö/ in Hopi (note löqö, above), /u/ in Cora and Huichol and /o/ in most of the other languages under immediate consideration. Proto-Uto-Aztecan *u is reflected as /o/ in Hopi, either /u/ or /o/ in Tarahumara and Varahio, /ə/ in Cora and Huichol and /i/ in Mejicano; otherwise, *u reflects /u/. Examining again the various forms for pine as cited above, Miller's equation of Cora and Huichol /huku/ and /huukuu/ with *hoko appears to be correct; e.g., *o→u. However, there is no evidence for a *u→/o/ shift in either Northern or Southern Tepehuan, as would be expected if their forms /ukui/ and /huk/ are cognates for *hoko (see also Bascom 1969) for a consideration of Proto-Tepiman phonology). Tarahumara /ʔoko/ could go either way; e.g. P-U-A *o→/o/, hence *hoko, but also P-U-A *u→/u/, /o/, hence possibly also *huku. If the association of the Hopi form for "juniper" /ho-qölö/ is introduced here, it should also reflect *hu, not *hoko.

Based on this evidence, we tentative suggest that there may have been two early Uto-Aztecan generics *woko and *huku, both designating pines or other evergreens. We further suggest that Miller's *hu, "wood" (UAC #474) and Proto-

Numic *huu, "stick, wood" but also "tree" may ultimately derive from *huku, pine or evergreen. The elevation of *huku to the status of a life form "tree" and the subsequent association of "tree" with "fire, firewood," etc. may derive from its cultural importance and early use as fuel (see Chapter V for discussion of *ku, "fire, firewood"). At some period in Uto-Aztecan history, perhaps through a migration into areas where *huku was unimportant or insignificant ecologically, it may have lost its generic association. In these areas, however, its semantic identity with "tree, wood, stick," etc., was retained. Subsequently and particularly since the divergence of Numic from Tübatulabalic and other northern Uto-Aztecan languages, the life-form status of Proto-Numic *huu seems to have decreased. This "devolution" may be correlated with some major change in cultural orientation for the northern Uto-Aztecans, such as the suggestion by various authors that these groups may once have been horticultural (see Miller 1966 for evaluation). Berlin (1972) has suggested that "devolution" of this type, e.g. toward generality rather than specificity, could take place under such circumstances.

Although a closer examination of the linguistic and historical evidences for this proposal is now required, as an hypothesis accounting for the semantic unity of "stick, wood, fire, firewood, etc.," it has merit. Friedrich (1970) has argued similarly for the development of Proto-Indo-European *dow, "oak," into "tree."

APPENDIX D

SOME ADDITIONAL TAKIC CORRESPONDENCES

Following are some additional correspondences for the Takic languages (Luiseño, Cahuilla, Cupeño, Serrano, etc.), as cited in Bright (1968), Bright and Hill (1967), Hill (1966), Hill (1967), Kroeber (1909), Kroeber and Grace (1960) and Miller (n.d.). For many, the data are insufficient to determine whether the forms should be included in the reconstructed sets as given in Chapter VI. Abbreviations are as given in Table 4.

A. Plants

Prunus demissa	(L) ʔa.tu-t; (Ca) atut
Chamise, greasewood *Adenostoma fasciculatum*	(L) ʔuʔu.-t; (Ca) uʔu.-t
Wild rose *Rosa californica*	(L) ʔuš-la; (Ca) usal
A seed plant (?)	(L) pa.ki-l (*Lepidium nitidum*); (Ca) paq-ily (*Baccharis glutinosa*).
Ryegrass (*Elymus condensatus*	(L) pa.xanki-š; (Ca) pa-han-kis
Blue oak *Quercus dumosa*	(L) pa.wi-š; (Cu) pawi
Mansanita *Arctostaphylos* sp.	(Ca) ta-tuka; Cu) tatxəʔi
Marsh plant (?)	(L) te.ʔi-š (cattail rush);(Cu) tiʔi (marsh plant)
Alder	(L) tukon-la, tuko.nu-t; (Cu) tukənə;(Sr) tɨkɨtɨ

Soap plant Chenopodium californicum	(L) qaxa.wo-t; (Ca) kiʔawet
Elderberry Sambucus sp.	(L) ku.-ta; (Cu) kuʔut; (Sr) kuuhutɨ
Barrel cactus Echinocactus sp.	(Ca) kupash; (Sr) kupata
Milkweed	(Ca) ke-at; (Sr) kaʔata
Islay Prunus ilicifolia	(L) ča.mi-š; (Ca) chamish
Yerba mansa	(L) čevni-š; (Ca) chivnish
Burr (?)	(L) čuna.-la (cockleburr); (Cu) cunə (sand burr); (Sr) caŋakaʔa (thistle)
Yucca sp. (?)	(L) čikepi-l (food prepared from yucca stalks); (Cu) səvəyʔə; (Sr) ciŋkət
Willow Salix sp.	(L) saxa-t; (Ca) sakhat; (Sr) haqata
A type of greens (?)	(L) ṣiʔqa-l (Psoralea orbicular-is); (Cu) siʔqa (clover)
A grass	(Ca) suul (Muhlenbergia rigens); (Cu) suu (deergrass)
Thornbush Acacia greggii	(Ca) sichingil; (Cu) səcini thornbush sp.
Mushroom	(L) saqapi-s; (Cu) səqəpi
Arroweed Pluchea sericea	(L) han-la; (Ca) hangal
A bush sp.	(L) hun-la (a type of bush); (Ca) henily (Haplopappus palmeri)
Fern	(L) maṣ-la; (Cu) masi
Cattail	(L) me.-la (head of cattail); (Cu) miʔi
Beavertail cactus Opuntia basilaris	(L) me.xa-l; (Ca) manal; (Cu) manə

Mesquite	(Ca) menyikish; (Cu) mənəgi; (L) ʔe.-la; (Sr) ʔo.cu
Jimson weed *Datura meteloides*	(Cu) mani; (Sr) maniici
Yucca fruit	(L) ne.ni-l; (Ca) ninyily; (Sr) nɨnǫm, nǫnǫm
A sedge (?)	(L) ne.nixya-l (*Carex schottii*); (Ca) ngai-al (*Suaeda suffructescens*)
Juniper	(L) wa.ʔa-t (*Juniperus californica*); (Ca) iswat (*J. occidentalis*)
Sage *Artemisia tridentata*	(L) wi.ka-t; (Ca) wikwat; (Sr) qa.q^{W}ac

B. Animals

Antelope	(L) ton-la; (Ca) tenil; (Cu) tɨmɨnǫč
A mouse sp.	(L) paʔa-š; (Sr) paʔišt
A mouse sp.	(L) tapaš-ma-l; (Cu) təəpəni
cottontail	(L) to.ṣiqa-t; to.ṣixi-t; (Cu) tisixa; (Sr) tǫX^{W}okət
A rabbit sp.	(L) to.vi-t (bush rabbit); (Ca) tevit-em
A bird sp.	(L) čixe.-ma-l (kingbird); (Cu) ciitə-ma (bird sp.)
Meadowlark	(L) ʔisa.-l; (Cu) ʔisa
Blackbird	(L) pa.xiŋi-š; (Ca) paxantc-im
A bird sp.	(L) tuku.pa-wu-t (Oriole); (Cu) tukupuwi (woodpecker)
Bluejay	(L) wiʔkasmal; (Cu) wik'ikmal (bird)
Owl	(L) ča-t (barn owl); (Sr) čaat; čaXat (screech owl)
Burrowing Owl	(L) kuku.-l; (Ca) ququl

A bird sp.	(Ca) guakuc (hawk sp.); (Sr) k^{w}a:'ç (buzzard)
Chicken hawk	(L) pa.kiš-la; (Sr) pa:kihac
Crane (?)	(L) qaru.-t (sandhill crane); (Cu) kərə (a goose?)
A water bird sp.	(L) we.sa-l (white brant; (Cu) wisə (mud hen)
Lizard sp.	(L) şakaro.n; (Ca) tcaxul-am
Snake sp.	(Ca) palokol (milk snake); (Sr) panoX^{w}at (king snake)
Snake sp.	(L) qiqeŋ-la (ring snake); (Cu) qəqini (king snake)
Bumblebee	(L) ku.kunta-la; (Cu) kutaŋvə
Bee sp.	(L) kupsax̌-la (bumble bee); (Ca) kumsexwet (yellowjacket)
Dragonfly	(L) kamari.uδ̌e; (Sr) X^{w}q̣i:n̋in̋i'
A fly sp.	(L) kuyvaxi-š (firefly); (Cu) kuvə (gnat)
A fly sp.	(L) kwaʔa.-l; (Ca) aʔawat
A fly sp.	(L) kuʔa.-l; (Cu) kuʔə
Grasshopper	(L) wiʔe-t; (Cu) wiʔa
Butterfly	(L) ʔavelaka; (Ca) malvə; (Sr) Xadavadavat; lalaba
Head louse	(L) ʔula.-t; (Cu) ʔaləʔə
Stinkbug	(L) ṣisqi-la; (Cu) sisqəŋi
Worm sp.	(Ca) sivuyal-em; (Cu) sivuyə
Small ant sp.	(Ca) kuvucnily-am; (Cu) kuşinvə
Blackwidow spider	(L) kuyxiŋi-š; (Cu) kuka; (Sr) ķukač
Spider sp.	(Ca) Xwalxwal; (Cu) x^{w}alx^{w}a
Walking stick	(L) čoka.yalaš; (Cu) qaʎəxpə
Insect sp.	(L) ke.ki-la; (Cu) kəʎivuy

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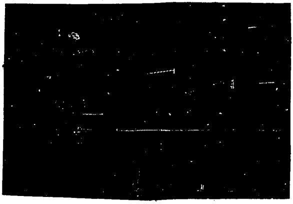
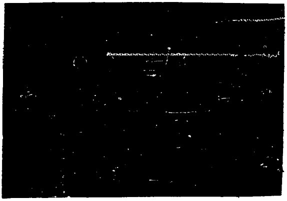
PLATE I: BASIN AND RANGE VIEWS

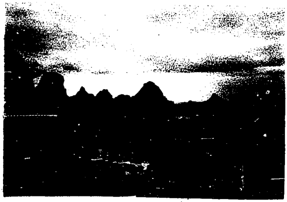


a: Upper Newark Valley, Nevada: broad valleys typical of Basin and Range.



b: Ruby Valley, Nevada: pinyon and juniper on hillsides, sage in foreground.

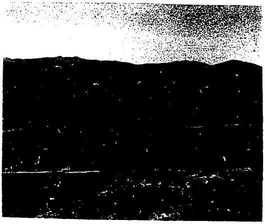
c: Newark Dry Lake, Nevada (playa).



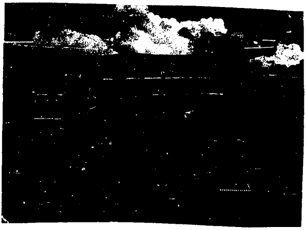
d: Barren shores of Pyramid Lake, Nevada.

PLATE II: VARIOUS BASIN ENVIRONMENTS

a: Cottonwoods near spring, southwestern Utah.



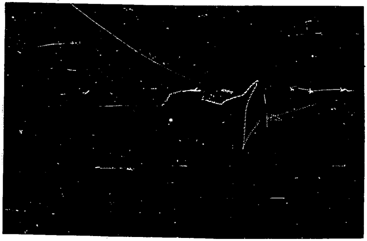
b: Buckberry - willow association, Dixie Creek, Nevada.



c: Cave Springs Canyon, northeastern Nevada.

d: Kolob Canyons, southwestern Utah.

PLATE III: HOT DESERT VIEWS

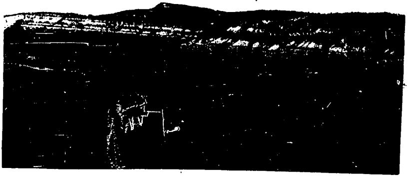


a: Yucca - Joshua tree association, Las Vegas, Nevada

b: Mesquite - creosote association, southwestern Utah.

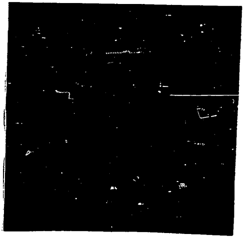
c: Narrow-leafed yucca in fruit, southwestern Utah.

PLATE IV: COLORADO PLATEAU VIEWS



a: Rim of Utah's High Plateaus: Cedar Breaks, Utah.

b: Canyons and slickrock, southwestern Utah.



c: Colorado Plateau deserts, southeastern Utah.