GREAT BASIN PREHISTORY AND UTO-AZTECAN

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ABSTRACT

Studies of the Great Basin show that the Desert cultures of 8000 B.C. closely resemble the historic cultures of that area, but linguistic evidence indicates that the ancestors of the historic inhabitants moved into the Great Basin as late as 1000 years ago. The linguistic affiliation of the prehistoric cultures thus cannot be directly inferred. Taylor has proposed that Hokaltecans settled in the Great Basin at an early age and were only recently replaced by Uto-Aztecans who moved in from the northeast — an offshoot from a major Uto-Aztecan movement down the western flanks of the Rocky Mountains. This hypothesis does not satisfactorily account for the distribution of the major subdivisions of Uto-Aztecan and directly contradicts the implications of the distribution of Numic (Plateau Shoshonean) languages. An alternate hypothesis is proposed, namely, that Uto-Aztecans moved southward from the northern Great Basin as the Altithermal began; that they moved in two major branches which skirted the Great Basin, one along the Rocky Mountains, the other along the Sierras; and that, as the Medithermal set in, the Numic branch (northernmost Sierran branch) began to move back into the Great Basin proper, this movement being retarded until about 1000 years ago by the presence of horticulturists. This hypothesis is supported by correlations between lexico-statistical dating of the separation of Uto-Aztecan languages and the dates of climatic periods, and by the distributions of the major Uto-Aztecan branches. Identification of these branches follows recent linguistic studies by Voegelin and Hale. Previous classifications of Uto-Aztecan languages, theories concerning the location of the ancestral Uto-Aztecan community, and the implications of these for the present hypothesis are discussed.

THE GREAT BASIN, which lies between the Rocky Mountains and the Cascade-Sierras from central Oregon south to the Colorado River, is an area of internal drainage with generally high elevation, ranging from 1000 to over 2000 m. A series of high tablelands and mountains, occasionally reaching 3000 m., runs north and south; between the tablelands lies a series of basins which serve as catchment basins for precipitation (Cressman 1956: 378).

Indian groups found in the Great Basin in historical times pose few problems for ethnographic description. The environments of most of the area limit population to an average of one person per 15 or 20 sq. mi. (Steward 1937: 628). Even this sparse population could only survive with an intensive and continuous cycle of food-quest activities; among some groups unproductive members were abandoned and population was artificially restricted (Harris 1940: 43). Basin dwellers were characterized by a "family level of sociocultural integration" (Steward 1955: 101–21); small groups — usually nuclear family plus a few associated relatives — ranged over a wide stretch of territory in the summer, collecting seeds and hunting whatever game was available. Steward (1955: 105) reports that

> . . . all of the plant and animal foods had in common the extremely important characteristic that the place and quantity of their occurrence from year to year were unpredictable, owing largely to variations in rainfall. A locality might be very fertile one year and attract large numbers of families, but offer little food for several years thereafter . . . Throughout most of the area, the families were concerned predominantly with warding off potential starvation by moving from place to place.

A large group of families might gather in one place for a rabbit or antelope hunt, for the pinyon nut harvest, or for the Gwini ceremonies, but these meetings were brief because the food supply could not support a large population in a small area for more than a few days. In the winter, when gathering was unproductive, groups of two to 15 families settled near cached food supplies in winter villages. The villages were only loosely organized under a headman and were not part of any larger system of social organization. While it often included a number of related families that habitually returned to the same valley each year, the personnel of the winter village was by no means stable. A family might winter one year with eastern neighbors and the next year with western neighbors (Steward 1937: 629). The changing composition of participants in winter settlements, hunts, harvests, and ceremonies created a network of relationships across the Great Basin that worked against the formation of regional differences. Steward (1937: 630) described Shoshoni populations from southern Nevada to southern Idaho as

> . . . a vast net, the people of each village being linked to those of villages on all sides by varied economic and social activities as well as by marriage. There were no landowning bands, no important property rights, no exogamy other than that connected with the bilateral family.

The area of this net changed constantly, and Harris (1938: 408) has noted that there was a "constant territorial overlapping of group and tribal boundaries. Paiute camps often came east

into Shoshoni territory, and Shoshoni camps went west into the Paiute area."

This is not to say that there were no differences from group to group in the Great Basin. The basins and valleys and the dividing tablelands furnished a variety of different ecological zones, and local Indians exploited their particular areas in different ways. However, the pattern of the yearly cycle and its techniques and the pattern of social organization remained fairly constant across the whole of the Great Basin proper. Around the fringes, where the arid environment gives way to more productive regions, populations linguistically like those in the Great Basin proper made other adjustments. The Bannock took salmon from the Snake River, and the Owens Valley Paiute had permanent settlements in a relatively lush valley.

That the Great Basin was occupied prehistorically by similar groups is known from the archaeological evidence at sites like Danger Cave. Jennings (1957: 3) states that

> In fact, the inventory of food plants, mammals, birds and insects utilized by the Gosiute (and by the western Shoshoni-speaking tribes of the Basin generally, e.g. Stewart 1941, pp. 371–7) during the annual subsistence cycle is closely parallel to that inferrable from the fauna and flora found in Danger Cave. The parallel between the historically observed Shoshoni cultures and the inferrences warranted about the archaeologically derived cultures is so close that we assume no basic shifts in economy, in general balance with the environment, or in cultural orientation to have occurred since man first invaded the Basin. Further, a socio-political organization and a cultural orientation very like that of the historic tribes are postulated for all the cultures of the Great Basin for the past 10,000 years.

Local and temporal variations occurred within this pattern (Jennings and Norbeck 1955: 3). Several are suggested by Jennings (1957: 282–3): in the southeastern sector, the Cochise variant; a variant in Nevada and California (including the Humboldt Valley subarea); a variant in the northeastern sector (the Oregon caves described by Cressman 1956); and a variant in eastern Utah represented by the Uncompahgre (Wormington and Lister 1956) and Fremont (Morss 1931) material. This prehistoric culture (or group of cultures) and archaeological cultures having similar adaptations have been referred to as the Desert culture (Jennings 1957: 6).

The southeastern variant developed or otherwise acquired horticulture, as did the eastern Utah variant and possibly the Nevada-California variant as well. From at least as early as A.D. 400 to about the end of the 13th century, horticulture spread throughout a large but not yet completely defined area of the Great Basin. In the remainder of the Great Basin, the Desert culture continued and, judging from archaeological evidence, the subsistence techniques of the Desert culture were practiced even in horticultural settlements. With the withdrawal of horticulture from the Great Basin around the end of the 13th century (Jennings and Norbeck 1955: 4–7) or in the preceding century (Jett 1964), Desert cultures refilled the area and remained until historic times.

The northern Basin culture variant (Cressman 1956) diverged in a different way. The Klamath Lakes basin in southern Oregon was occupied by 10,000 years ago, when conditions there and in the Great Basin further south were the same. The cultures in the lowest Klamath strata resemble the Desert culture. The drainage of the Klamath Lakes differs from the internal drainage of the Great Basin proper by having an outlet to the sea, which brings in fish, and in having a steady supply of water from streams and rivers. The area of the lakes has remained almost constant since the first occupation of these sites. The Klamath variant of Desert culture was adapted to this lake-marsh environment, and by 3500 years ago had developed a pattern of primary dependence on fish and meat (Cressman 1956: 467). Jennings and Norbeck (1955: 3) predict that, as more research is done in the Basin proper, a number of lakeside specializations will be found alongside Desert culture.

If there were no other data, it would be easy to draw the conclusion that the historic Great Basin dwellers were the direct descendants of the prehistoric Desert peoples and that there were no major population movements during the past 10,000 years. When linguistic data are considered, however, complications arise.

The languages of the historic Great Basin were included by Kroeber (1907: 97) in his classification of the Shoshonean languages, which he divided into the Pueblo branch (Hopi), the Kern River branch (Tübatulabal), the Southern California branch (Serrano, Gabrielino, Luiseño-Cahuilla), and the Plateau branch. Within Plateau Shoshonean (the languages of the Basin), three subdivisions were recognized (Kroeber 1934: 16): Ute-Chemehuevi (Ute, Southern Paiute, Chemehuevi, and

Kawaiisu), Shoshoni-Comanche (all true Shoshoni, including the Wind River and Comanche east of the Rocky Mountains, and Panamint or Koso), and Mono-Bannock (Bannock, Northern Paiute or Paviotso, and Mono).

Lamb (1958), who analyzed dialect material collected in the Great Basin (1953–55), concluded that Kroeber was correct in recognizing Plateau Shoshonean as a genetic group with three subdivisions. For a number of reasons (Lamb 1958: 96), the term Numic (based on the word for person or Indian in the languages concerned) is suggested as a replacement for Plateau Shoshonean. The three branches of Numic have been renamed by Lamb as follows:

(1) Monachi-Paviotso: (a) Monachi: Owens Valley, California; (b) Paviotso: the remainder of "Northern Paiute."

(2) Panamint-Shoshoni: (a) Panamint: Shoshoni of southwestern Nevada; (b) Shoshoni: Shoshoni of northern Nevada, Wyoming, Utah, Idaho, and Comanche.

(3) Kawaiisu-Ute: (a) Kawaiisu; (b) Ute: Ute, Southern Paiute, and Chemehuevi.

According to Lamb, the Numic family is most closely related to Tübatulabal, the sole member of the Tubatulabalic family. Within Numic, the Monachi-Paviotso and Panamint-Shoshoni resemble each other more than either resembles Kawaiisu-Ute. Likewise, Kawaiisu-Ute shares some structural features with Tübatulabal that the other two branches do not share.

Besides the structural analysis, Lamb cites glottochronological figures from Swadesh (1954–55) for minimum centuries of divergence between the languages of Numic. Hale (1958) has also calculated the approximate dates of separation of five Numic languages. Where the Lamb, Swadesh, and Hale studies overlap, they show the same divisions of the group, but the dating varies slightly from Swadesh to Hale. The figures indicate the separation of Numic and Tubatulabalic in the neighborhood of 3000 (Swadesh) to 2300 (Hale) years ago, followed by the splitting up of Numic about 2000 (Swadesh) to 1000 (Hale) years ago.

Lamb calls special attention to the geographical distribution of the Numic languages. Each of the three branches has one representative in a small cluster near the southwestern corner of the Great Basin, adjacent to Tubatulabalic. The other language of each branch stretches north and east across the Basin. The internal diversity of each of the six languages is apparently about the same, so that dialects cover a large area in the east but are more compact in the west. Lamb reconstructs the events which could have led to this distribution. During the second millennium B.C., possibly in the region now occupied by Tübatulabal, Numic was gradually becoming distinct from Tubatulabalic. Before the separation was complete, two mutually intelligible dialects had begun to form within Numic. One, which remained under the influence of Tubatulabalic for some time, developed into Kawaiisu-Ute. The other dialect separated into Monachi-Paviotso and Panamint-Shoshoni. The original Numic dialects may have occupied an area that included the historic territory of Kawaiisu and Tübatulabal. Until perhaps 1000 years ago the three Numic languages occupied only a small area in the southwestern corner of the Great Basin. At that time the northward and eastward movements of these already distinct branches began.

Dialect differences in Paviotso, Shoshoni, and Ute are so small that it is difficult to imagine that they have occupied the vast areas of the Great Basin for more than a few centuries, and Lamb concludes that the Great Basin population up to about 1000 years ago is not accounted for linguistically and may have been Uto-Aztecan, Hokan, Zuni, Keres, Algonkian, or even a stock that is now totally extinct; in other words, there is no direct indication of what the linguistic situation was in the Great Basin prior to the recent spread of the Numic languages.

A synthesis of the archaeological, linguistic, and ethnographic data from the Basin is thus handicapped by an apparent lack of convergence of data from the three disciplines. Archaeology suggests that the Desert culture, with regional and temporal variations within narrow limits, has been found in the Basin for 10,000 years. Linguistics indicates that the historic Great Basin inhabitants, with a modern Desert culture, have not been there longer than 1000 years. Ethnographic data is of little help in resolving this conflict because cultural ecology suggests that Desert culture was a successful adaptation to the harsh environment and that groups of any cultural background or linguistic affiliation would tend to adopt Desert culture on entering the Basin. It is impossible, then, to write a prehistory of the Great Basin from data gathered in the Great Basin alone; a synthesis must be guided by interpretations of data from adjacent areas.

A number of attempts have been made to sketch prehistoric population movements that could have led to the historically known distributions of languages and cultures. The burden of proof rests on linguistics, and the issue of the linguistic affiliation of populations is central to these studies. Since it is the Uto Aztecan stock which is most often considered the key to Basin prehistory, a review of the classifications of Uto-Aztecan languages and the theories concerning the point of origin of the ancestral community is in order.

The common origin of the languages in the Uto-Aztecan stock is no longer in question, but how the various languages are to be grouped within the stock has been the subject of a lengthy controversy. Discussion has centered around the distinction between geographical and genealogical classifications, the first grouping languages according to where they are found, the second grouping them according to shared developments of linguistic features since diversification of the proto-language.

The work of Buschmann (1859) led to the recognition of the genetic unity of the languages which Brinton named Uto-Aztecan. The three geographical subdivisions of the stock were *Shoshonean,* which included languages of southern California and the Great Basin, *Sonoran,* which included languages of northwestern Mexico, and *Nahuatlecan,* which included languages of central and western Mexico and Central America. Buschmann believed that only the first two were genetically related; he attributed the similarities between these and Nahuatlecan to extensive borrowing. Brinton (1891: 118), however, maintained that "at some remote epoch all three were offshoots from some one ancestral stem." Powell (1891), following Buschmann, regarded the genetic relationship as unproven. Kroeber's 1907 essay was intended to prove to Powell and his followers that the closely related languages in the geographical subdivision called Shoshonean were indeed related genetically to languages in the other two subdivisions. By taking the Shoshonean languages alone, in deference to Powell's views, "as if they indisputably composed a distinct family," Kroeber (1907: 155) showed how the languages were related to each other and established a genealogical classification of Shoshonean. He then brought in additional evidence from Sonoran languages and from Nahuatl and demonstrated that Shoshonean was *not* a distinct family with no external relations but that it was part of a larger linguistic group, Uto-Aztecan. He did not say that he believed Shoshonean to be anything other than a convenient geographical grouping of related languages.

Some 25 years later Kroeber (1934) did propose that Shoshonean be considered as a genealogical as well as a geographical subdivision of Uto-Aztecan. Whorf (1935a, b) objected that the Shoshonean languages showed no unique developments from the ancestral language that would justify setting them aside as a separate, single branch of Uto-Aztecan; as he put it (1935b: 608),

> Taking even the largest geographical division, Shoshonean, does it mean anything linguistically? Are there any traits that distinguish "Shoshonean" from the rest of Uto-Aztecan? If there are, I do not know what they are.

The Sonoran languages had been treated by Kroeber (1907, 1934) and Mason (1962) as a number of independent branches of Uto-Aztecan allied under a simple geographical classification but with no linguistic unity. Whorf maintained that Shoshonean was likewise simply a geographical cluster of independent Uto-Aztecan branches. Mason (1962) agreed with Whorf (1936) in breaking up Shoshonean into five distinct branches; Lamb (1958) has also denied that Shoshonean has linguistic unity.

More recently, however, Hale (1958, 1959) and Voegelin and Hale (1962) appear to be reviving the original tripartite geographical classification as a genealogical classification. Hale (1958: 107) presents glottochronological analyses suggesting that the Uto-Aztecan stock split first into a "Northern" and a "Southern" substock, Northern developing into a Shoshonean branch and a Sonoran branch, and Southern into the Nahuatlan branch (Brinton's Nahuatlecan). This view is supported by counts of shared vocabulary (including items other than the glottochronological list) in Voegelin and Hale (1962: 115). There are indications in both glottochronology and shared-vocabulary counts that a slight revision of Shoshonean is in order; Hopi and the southern California languages — at least some of them — might better be considered Sonoran rather than Shoshonean, or possibly might be considered a fourth branch of Uto-Aztecan closely connected to Sonoran (Hale 1964).

The status of Uto-Aztecan classifications still rests uneasy. There has never been any doubt

that Shoshonean, Sonoran, and Nahuatlan represent, at the very least, useful geographical subgroupings of families within the Uto-Aztecan stock. Voegelin and Hale (1962), while explicitly denying that they want any part of the controversy in classifications, give strong indications — such as the reconstruction of Proto-Aztec, Proto-Sonoran, and Proto-Shoshonean phonologies — that there is some genealogical substance to the subgroupings as well.

Once it has been established that a group of languages developed out of a common ancestral speech community, as is implied by a genealogical classification, the question which naturally arises is, where was that speech community located?

Romney (1957), who has used Uto-Aztecan to demonstrate the application of the genetic method in historical reconstruction, has placed the origin of Uto-Aztecan near the upper Gila River or the northern Sierra Madre. This location is chosen because of vocabulary items which, Romney believes, can be reconstructed for Proto-Uto-Aztecan:

> . . . pine, juniper, oak, *phragmites communis*, prickly pear and beargrass. This specific assemblage of plants occurs in the Southwest at an intermediate altitude zone. It is typical of the upper Gila drainage in southern New Mexico and of the northern Sierra Madre. It is certainly not a desert environment as is found in the lower Gila, nor does it indicate a high altitude, say above 7000 feet (Romney 1957: 39).

The time depth of the Proto-Aztecan community is placed at about 1000 B.C., as Romney reports (1957: 39–40):

> A very tentative result obtained by Romney and Kelley using the Swadesh technique shows an age of 3000 years for the linguistic divergence within Uto-Aztecan proper. The results also show that Pima-Tepehuan was the first to break off . . . For the non-Pima-Tepehuan Uto-Aztecans it indicates a continual divergence with neighboring groups in contact with each other until fairly recent times, that is, until about 1000 A.D.

Proto-Uto-Aztecan vocabulary has also been used to establish agriculture as a trait of the ancestral community. The nonagricultural Shoshoneans are seen as having lost a previous agricultural tradition connected with agriculture in the Great Basin from about A.D. 700 to 1200. Terms suggesting agriculture are: "planting stick, mano, metate, two terms for maize, and one for planted field" (Romney 1957: 38–9).

These arguments are difficult to evaluate, as the list of Uto-Aztecan reconstructions used by Romney apparently remains unpublished, and it is not clear what languages were used as sources or how cognates were identified. Romney (1957) and Hale (1958) are either using a different selection of languages or identifying different cognates, as cognate-counts on the standard glottochronology list differ by about 10% (representing the difference between 30 and 40 minimum centuries of divergence [Swadesh 1960: 111]). Thus there is the possibility that the list used by Romney includes some apparent cognates that are early loans between Uto-Aztecan languages.

If we can accept the hypothesis that maize and other features passed up from Mexico to the Southwest in a corridor of Uto-Aztecan speakers that did not extend to Shoshonean (Haury 1962), the lack of agriculture among Shoshoneans is more easily explained. This would also be a likely situation for the transmission of agricultural vocabulary at a stage early enough to predate sound shifts which would make loans difficult to identify.

Voegelin and Hale (1962) reconstruct three items which may have been those used in Romney's list: pine, prickly pear, and corn or corncob. Pine is attested from all major groups of Uto-Aztecan; prickly pear from Papago, Hopi, Huichol, and Luiseño only; corn or corncob from Papago, Tarahumara, Zacapoaxtla, and Pochutla. If Hale's suggestion of a fourth branch of Uto-Aztecan that includes Luiseño-Cahuilla and Hopi is acceptable, then of these three terms only pine is attested from all branches of the stock.

Romney's paper, which was written in 1953, predated the more reliable lexicostatistical datings of Swadesh (1954, 1954–55) and Hale (1958), which suggest almost 5000 years of internal divergence within Uto-Aztecan. It also predates Lamb's (1958) study of Numic distributions and the comparative phonology of Voegelin and others (1962). These studies call for some revision in Romney's suggestions. Until it can be shown how later studies can be incorporated, Romney's paper is perhaps best seen as an attempt, as its author states (Romney 1957: 37), "only to present the potentialities of the [genetic] model, not to report a complete reconstruction of Uto-Aztecan history."

A second comment on the origin of Uto-Aztecan which has been considered in interpretations of Great Basin prehistory is that of Lamb (1958: 99), who remarks that when Proto-Uto-Aztecan was beginning to spread and diverge

into a number of dialects some 5000 years ago, "it may have been located somewhere in the neighborhood of the boundary between Arizona and Sonora." The remark was made in the context of a discussion of the Numic languages and their distributions and was not further supported.

In judging these suggested origins, two considerations arise. First, in neither case was the establishment of a point of origin for Uto-Aztecan the primary purpose of the essay, and thus the hypotheses are not strongly supported by data. Romney was concerned with a demonstration of the genetic model, Lamb with the distribution of the Numic languages. Second, the term "origin" does not here imply ultimate origin, but is used only as

> . . . a shorthand way of indicating the incipient stage at which any particular constellation of features is first presumed to occur. Thus we may speak not only of the origin of the genetic unit, but also of the origin of various subdivisions in the later stages of development (Romney 1957: 37).

Taylor (1961) is correct in pointing out that when the connections between Uto-Aztecan and Penutian are considered, we are forced to consider another "origin" of Uto-Aztecan — that of Uto-Aztecan as a branch of Macro-Penutian.

The genetic model of historical reconstruction uses the distributions of independent variables — language and physical type, for instance — to make inferences about the common origin of clusters of features; in discussing this model, Romney (1957: 37) notes that:

> Drawing upon well known methods of historical reconstruction the genetic model focuses attention on the task of locating the region and time in which the ancestral group lived and in tracing their migrations, developments, fusions, and differentiations up to the present. The data are ordered according to tribes which we infer to share a common historical tradition at some time in the past and thus focuses attention to the fact that people are in the last analysis the creators and carriers of culture.
>
> The genetic model complements current tendencies which make interpretations upon an area based framework. For some problems we must go beyond an area-bound construct. Where meaningful historical units extend outside a traditionally defined area a change in perspective may lead to new results.
>
> Rather than assuming that people have always been pretty much in the same place the genetic model directs attention to such questions as: When did the people who occupy a given region arrive there, from what direction did they come, and what cultural equipment did they bring with them? Meaningful questions about developments within sub-groups may then be posed.

If the independent inferences of archaeologists, linguists, and ethnographers can be joined in a single historical synthesis, we may gain considerable insight into the prehistory of the Great Basin. Data need not be taken solely from the Great Basin, but from related areas as well.

Taylor (1961) has attempted a synthesis of the archaeological and linguistic data from the Great Basin and adjacent regions, compiling an impressive amount of material to indicate that there is a connection between Hokaltecan ancestral groups and Desert culture. Taylor proposes the hypothesis that some centuries before 10,000 years ago, Hokaltecan speakers moved into the northern Great Basin, developing or taking over Desert culture. They then expanded into California on the west and followed the desert through the Basin, Southwest, and northern Mexico as far east as the Gulf of Mexico. Radiocarbon dates indicate Desert culture settlement of Coahuila as early as 9000 years ago, but lexicostatistics date the break between Coahuiltecan and Hokan as only 5500 years ago; this indicates that there was an unbroken band of Hokaltecan-speakers across the top of Mexico for several millennia after they first arrived. The internal diversity in Macro-Yuman (including Coahuiltecan and Seriyuman; Swadesh 1959) is about 92 minimum centuries, which correlates with a widespread distribution of Hokaltecan by the time of the early Coahuila radiocarbon dates.

By 5500 years ago, Taylor continues, one branch of Hokaltecan, the Hokan, had moved into California and spread south as far as Baja California. After Hokans were established in California, Penutian speakers entered from the north and moved through California, separating Hokan groups from each other and pushing Yuman and the rest of Pacific Hokan southward; Yuman settled in southern California or along the Colorado River. Taylor leans heavily on lexicostatistics but supports his hypothetical Hokaltecan movements with data from archaeology, physical anthropology, and ethnography as well.

At this point Taylor turns to Macro-Penutian and the Uto-Aztecans. If Penutian and Uto-Aztecan are developments from a single ancestral speech community, then that community was probably located in the mountainous region north of the Great Basin. Taylor (1961:

75–6) remarks that he had previously come to the conclusion that "Utaztecans were originally a mountain, or at least a highland, people and that they had moved from north to south primarily along the flanks of the western cordillera." This belief is supported (Taylor 1961: 76) by the observation that "within virtually every linguistic subgroup of Utaztecan there are both highland and lowland (mountain and desert) peoples."

To account for the highland-lowland distributions, Taylor (1961: 76) infers that, as the Uto-Aztecans moved southward along the western slopes of the Rocky Mountains, "they left remnant peoples in the mountains and from time to time they sent offshoots into lower elevations and more arid lands." One of these offshoots accounts for the single large area of Desert culture that is not Hokaltecan, the Great Basin, which was entered from the northeast by Shoshoneans, a remnant people from the Uto-Aztecan movement. Shoshoneans moved across the Basin, acquiring Desert culture along the way, until they lodged in the southwestern corner of the Basin. Taylor (1961: 76) admits that this hypothesis does not fit very well with the types of linguistic migration defined by Dyen (1956) and that it is difficult to reconcile with the study of Basin prehistory carried out by Lamb (1958).

Taylor's views on Hokaltecan are apparently sound, and his hypothesis accounts for the pre-Shoshonean Basin population in a way that checks with a wide variety of data. But the interpretation of Uto-Aztecan movements, particularly the rejection of Lamb's suggestion of Numic expansion, is not convincing.

Taylor apparently has two objections to Lamb's Numic paper: first, that the Arizona-Sonora origin of Uto-Aztecan is not tenable if the relationship of Uto-Aztecan to Penutian is considered; second, that an acceptable alternative to the southwestern Great Basin origin of Numic is that of the entrance of Numic from the northeastern Great Basin. Taylor (1961: 78) argues:

> Why is it not possible that the recent divergence within the Numic tongues occurred among remnant peoples left behind in the northern and central Basin, while their linguistic near-relatives continued southwestward with their already diverged dialects to end up in the stoppered funnel created by the antecedent Luiseño, the Sierra Nevada on the west, and the already established Yumans on the east?

Taylor (1961: 76) summarizes his arguments as follows:

> . . . it seems to me much too complicated to postulate (1) a separation from proto-Penutian in the distant north, (2) a migration southward to northern Mexico, (3) a divergence into many languages, and (4) a reverse migration northward again into the Southwest, the Great Basin, and the very region of their separation from the Penutians some 9000 years before. Perhaps this actually took place, but until more specific evidence is at hand to support it or definitely to belie contrary propositions, it would seem better practice to use as a working hypothesis some other, less complex, less compound hypothesis.

The point that the best working hypothesis is the least complex one is well-taken. But it should be demanded that the hypothesis be based on the most reasonable interpretations of the data, rather than forcing the interpretations to fit the hypothesis. The distribution and internal diversity of Numic languages clearly indicate a spread from the southwestern corner of the Great Basin to the north and northeast. Working within the broad outlines of Taylor's hypothesis, it is possible to construct an alternate view of the prehistory of the Great Basin which (1) accounts for the Numic expansion as suggested by Lamb, (2) considers the internal diversity of Macro-Penutian and Uto-Aztecan in greater detail, and (3) supports the hypothesis by the introduction of further data. The alternate hypothesis will be presented as a series of stages representing major population movements. The accompanying set of maps (Figs. 1–5) shows approximate hypothetical locations of the groups discussed.

The hypothesis that Penutian, Sahaptian, Uto-Aztecan, Tanoan, Kiowa, Mayan, and Totonac are genetically related will be accepted here as if it had been proven. Sapir (1929) proposed a Penutian stock which included California and Oregon Penutian, Chinook, Tsimshian, Plateau Penutian (Sahaptin, Molala-Cayuse, and Klamath-Modoc) and Mexican Penutian (Mixe-Zoque and Huave). Whorf (1935b: 608) indicated that he saw striking resemblances of Uto-Aztecan to Mayan and to Penutian "so deep-seated as to require grouping them all into one large family, which would also include Kiowa and its relatives and Totonac of eastern Mexico," and in 1940, Mason (1962: 58) reported that unpublished critical studies had convinced Whorf of the feasibility of combining Penutian, Uto-Aztecan, Mayan, and Mixe-Zoque-Huave in a single phylum termed

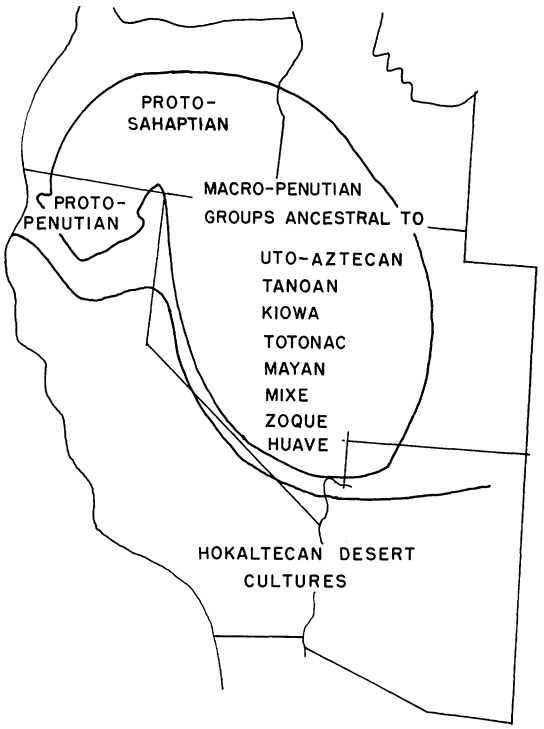

FIG. 1. Map of the Great Basin and adjacent areas showing hypothetical locations of major linguistic groups before the onset of the Altithermal.

Macro-Penutian, with the inclusion of Totonac still problematical. Swadesh (1956) supported the hypothesis by presenting provisional sound correspondences and structural similarities.

Within the hypothetical phylum, Uto-Aztecan and Tanoan were grouped by Whorf and Trager (1937), and resemblances between Kiowa and Tanoan were noted by Harrington (1910). Miller (1959) suggests that perhaps Tanoan is more closely related to Kiowa than to Uto-Aztecan. McQuown (1942) united Totonacan, Mayan, and Zoquean in a postulated Macro-Mayan group within Macro-Penutian. Totonac and Tepehua were allied by Arana Osnaya (1953).

Within Uto-Aztecan, the subdivisions Nahuatlan (Southern) and Sonoran and Shoshonean (Northern) will be used here, with the possibility that some Shoshonean languages — Hopi and Luiseño-Cahuilla — may be considered a fourth branch with Sonoran affinities. If the linguistic unity of these branches is denied, they may be thought of as geographical groupings of independent language families within Uto-Aztecan. The point is not critical, as the historical distributions of the languages imply that Uto-Aztecan speakers dispersed in a number of different population movements; and it matters little for the present hypothesis whether the groups which thus separated were or became three major branches of Uto-Aztecan or three clusters of numerous minor branches.

Glottochronological dating will be used as evidence to support dates of hypothetical population movements. It should be noted that these dates represent minimum centuries of separation; that is, they indicate that the speakers of the languages must have been separated for *at least* the number of years cited to allow for the observed amount of lexical change. Also, there are indications that hunting-gathering groups may long maintain a relatively uniform type of speech over a large area (Swadesh 1960: 86–9), and groups which remain in partial contact as they diverge may have an actual date of separation much earlier than that calculated by glottochronology (D. H. Hymes 1960: 19–24). Throughout this study, then, the actual date of separation of linguistic entities is assumed to

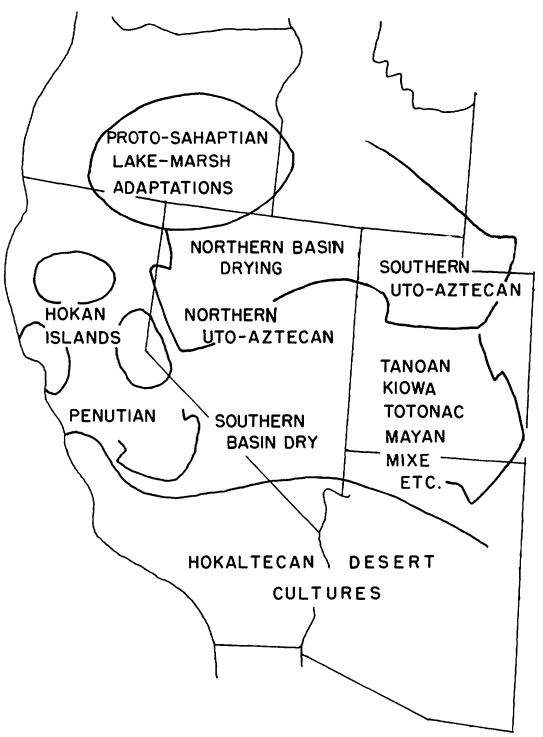

FIG. 2. Map of the Great Basin and adjacent areas showing hypothetical movements of major linguistic groups during the Altithermal.

be somewhat earlier than that indicated by the glottochronological figure.

The proposed hypothesis is as follows:

(1) The dispersion of Hokan-Siouan took place at an unspecified date probably well before 10,000 years ago, perhaps reflecting the difference between big-game hunting east of the Rockies and hunting-gathering to the west. Hokaltecans settled a large band of territory from California to the Gulf of Mexico in environments where the generalized Desert culture was a successful adaptation.

Moving in from the north, and also having Desert culture, Macro-Penutians occupied most of the Great Basin. (That all Hokaltecans were Desert culture does not, of course, imply that all Desert cultures were Hokaltecan.) Linguistic subdivisions of the Macro-Penutian phylum had probably already formed; Swadesh (1959: 10) calculates the internal divergence of Penutian as 10,000 years, indicating that Penutian groups were no longer homogeneous in speech by 10,000 years ago. This diversification may have taken place as Penutian groups began to move into California.

At this time, during the Anathermal, the Great Basin was a region of lakes. Rising temperatures and the disappearance of glaciers and lakes began after 9000 years ago (Cressman 1956: 378). It is probable that there were a number of Desert culture variants in the Basin at this time, some of them adapted to lakeside environments but not to the exclusion of Desert culture subsistence patterns (Danger Cave, Klamath Lakes, Leonard Rock Shelter, and other variants are charted in Cressman 1956: 464). Fig. 1 represents the hypothetical locations of major linguistic groups about 10,000 years ago.

(2) As the Altithermal set in, conditions in the Great Basin became hotter and generally drier. The period of maximum aridity began earliest in the southern Great Basin and reached the northern sectors after 7000 years ago. For Wilson Butte Cave, on the Snake River Plain north of the Great Basin proper, the period of maximum aridity began around 6500 years ago (Bryan and Gruhn 1964: 312–13). Just what impact the changing climate had on Desert cultures in the Great Basin is unknown, as the effects of minor fluctuations would have varied from one locality to the next. Hunting and gathering must have been somewhat less productive than in the Anathermal, and the disappearance of small lakes would have had serious implications for the lakeside-adapted groups.

While variants of Desert culture continued to thrive in some areas (for example, Danger Cave), much of the Great Basin population may have withdrawn in favor of more productive areas. Penutians were already in California; Proto-Sahaptians remained near the Klamath Lakes area where a lake-marsh environment continued. The remainder of the non-Uto-Aztecan Macro-Penutians may represent early departures from the southern Great Basin; Swadesh (1960, Fig. 5) calculates the separation dates of "Macro-Nahua" and "Macro-Maya" as 58 minimum centuries, that of Uto-Aztecan and Tanoan as 48 minimum centuries. During this period the Hokaltecan continuum across the top of Mexico was broken about 5500 years ago (see supporting data in Taylor 1961), probably by Macro-Mayan and Mixe-Zoque-Huave groups.

As the period of maximum aridity began in the northern Great Basin, Uto-Aztecans started moving southward. Internal divergence in Uto-Aztecan is variously calculated as from some 4000 years (Hale 1958: 107) to 4700 years (Swadesh 1960, Fig. 5). This may indicate that the first major break-up of Uto-Aztecans, the separation of the Southern groups which became Nahuatlan and the Northern groups which became Sonoran and Shoshonean (Hale 1958: 107), reflects different population movements skirting the drying Great Basin. The Northern groups are concentrated around the Sierras (adjusting for the recent Numic expansion) and the Southern groups around the Rockies and further south in Mexico. Taylor (1961) proposed a single movement down the Rockies. Here, to allow for major groupings within Uto-Aztecan, two such movements are proposed: the Southern Uto-Aztecans skirted the Great Basin on the east and followed the antecedent Macro-Penutian groups into Mexico along the Rockies; the Northern Uto-Aztecans skirted the Basin on the west and moved toward the Colorado River area.

The central Basin need never have been completely abandoned during these movements. The lexicostatistical figures indicate a divergence of Uto-Aztecan considerably later than the onset of the Altithermal in the northern Great Basin. If we postulate a continuous band of Uto-Aztecans moving southward, the denser populations of the fringes maintaining contact

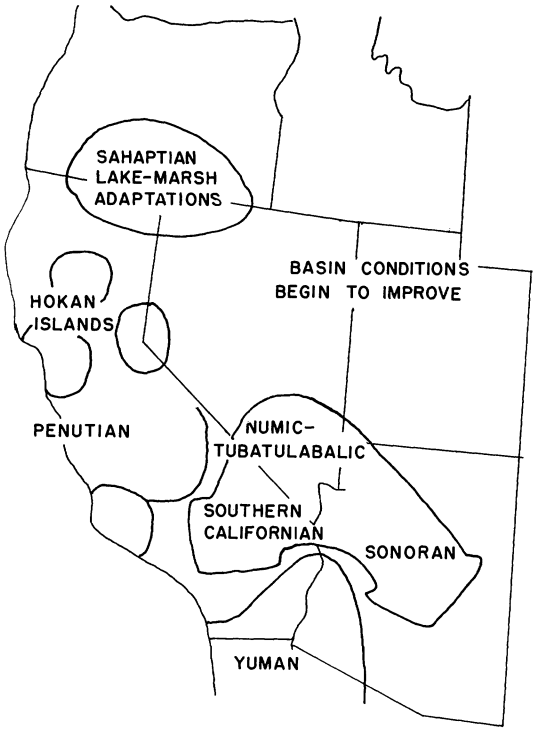

FIG. 3. Map of the Great Basin and adjacent areas showing hypothetical locations of major linguistic groups at the beginning of the Medithermal.

through a sparse population in the central Great Basin, with contact being broken only as the southern Great Basin was reached, these figures are justified. The earlier advent of aridity in the south should have sufficiently weakened populations there to allow for Uto-Aztecan incursions in a cycle of utilization, abandonment, and renewed utilization of small areas as minor fluctuations in the Altithermal occurred. Fig. 2 represents major population movements postulated for the Altithermal.

(3) As the Medithermal set in, about 4500 years ago, the Sonoran Uto-Aztecans continued to move southward. Uto-Aztecans in southern California may have been a separate branch of Uto-Aztecan more closely related to Sonoran than to Shoshonean (Hale 1964). This could reflect a difference between Tubatulabalic-Numic groups who continued to exploit the southwestern corner of the Great Basin and Sonoran-Californian groups which moved ahead, splitting around Yuman as the Sonorans continued into Mexico, again coming into contact with Northern Uto-Aztecans. Numic was becoming distinct from Tubatulabalic by 4000 years ago (Lamb 1958: 99), and the improving conditions in the Great Basin were apparently bringing about the beginnings of the northeastern expansion of Numic speakers. Fig. 3 represents the hypothetical locations of major linguistic groups in the early Medithermal.

(4) By 4500 years ago, maize had come out of the south, presumably through a corridor of Nahuatlan and Sonoran Uto-Aztecans (Haury 1962: 113), and it could have been the developing Hohokam and Mogollon cultures that broke the Sonoran-Shoshonean contact. The date of separation of Sonoran and Shoshonean is calculated by Hale (1958: 107) as at least 3200 years ago. Hopi-Cahuilla was separate from Tubatulabalic-Numic by 2700 years ago (Hale 1958: 107), and the distributions of Hopi and Cahuilla suggest that it was about this time that Hopi became involved in the horticultural sphere. The Great Basin was at least partly occupied by horticulturists, the extent of whose distribution is not yet known in detail. Gunnerson (1962) proposed that the Virgin, Sevier, and

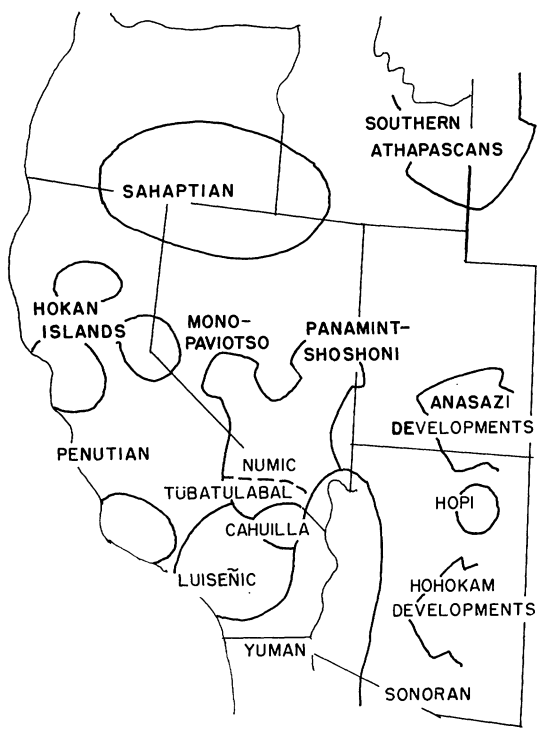

FIG. 4. Map of the Great Basin and adjacent areas showing hypothetical locations of major linguistic groups at the beginning of Numic expansion.

Fremont cultures were carried by Shoshonean speakers, noting (Gunnerson 1962: 43) that

> The long in situ development and late spread attributed to the Virgin branch is compatible with the long period during which proto-Plateau Shoshoneans spoke a common language (Hale) or, alternatively, shared a small area (Lamb).

Here, it is proposed that Numic speakers were west of the Colorado River area and that it was the existence of stable horticultural communities to the east that retarded Numic expansion. It is unlikely that Desert culture collectors could have easily expanded into an area occupied by populations with a stable subsistence base who also collected from the surrounding areas.

Southern Athapascans, probably coming out of western Canada where their closest linguistic relatives are found (V. D. Hymes 1955; Hoijer 1956), could have occupied parts of the northeastern Great Basin in this period as they moved south down the edge of the Plains, the Colorado Plateau, and the Rocky Mountains (Jett 1964: 295).

If the distributions of the Uto-Aztecan languages at this time (Fig. 4) are used as the basis for postulating the point of origin of Uto-Aztecans, it is obvious why the southern rim of the Great Basin would be the favored location. Whatever remnants of Uto-Aztecan and other language groups there may have been in the Great Basin were absorbed in the later Numic expansion. The southern Great Basin is the most recent center of dispersion of Uto-Aztecan languages and, if Uto-Aztecan were taken out of the context of its wider relationships, it would be impossible to speculate on an earlier point of origin. Lamb's (1958: 99) brief suggestion of an Arizona-Sonora origin was probably based on language distributions. Romney's (1957: 40) Gila River origin was based partly on distributional data and partly on a plant complex which may be reconstructable for Proto-Uto-Aztecan; it is possible that this plant complex characterized a larger sector of the Great Basin in the periods of Proto-Uto-Aztecan Basin occupation.

(5) The expansion of Numic about 1000 years ago, as described by Lamb (1958), brought the languages to their historic distributions. Kawaiisu-Ute is more similar to Tübatulabal than the other Numic branches, indicating that expansion along the southern rim of the Basin was retarded. Mono-Paviotso and Panamint-Shoshoni had expanded into the northern sectors of the Great Basin a few centuries before

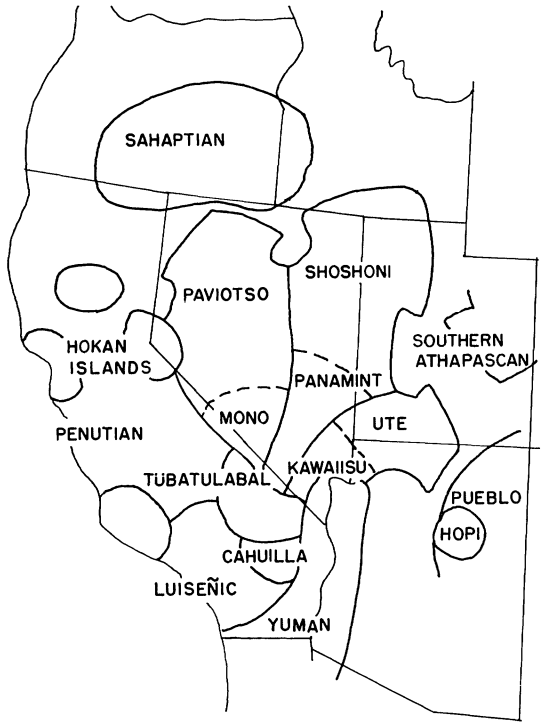

FIG. 5. Map of the Great Basin and adjacent areas showing the hypothetical locations of major linguistic groups and Numic expansion following the withdrawal of horticulture from the Basin.

Ute expansion began. This is to be expected from the presence of horticulture to the east of the Kawaiisu-Ute groups. Ecological factors and increasing raids disrupted and caused the abandonment of horticultural settlements after some 800 years ago (Jett 1964). It is likely that the raiders included Utes on the north and west and Southern Athapascans, who had arrived in the Southwest by this time (Eggan 1950: 321; Jett 1964: 295), on the north and east. The apparent arrival of the Southern Paiutes from the north (Euler 1964) is probably the result of Ute movements skirting north of the Pueblo settlements in the eastward Numic movement, and then turning southward. Fig. 5 represents hypothetical population movements during the Numic expansion.

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