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⁴These are spelled out in greater detail in my "Hierarchy of features and ergativity" (Silverstein 1977). There the whole basic inflectional syntax and complex-sentence system is treated within a universal framework that redefines the nature of so-called "ergative-absolutive" and "nominative-accusative" case-systems. It shows them to be multifunctional devices expressing case-relations, deference forms, and co- and switch-reference, in complicated but regular interactions with other categories, such as voice, aspect, clause-complementation linkage, etc.

⁵This form is not a synchronically-segmentable number suffix. Its origin has not been worked out on Chinook-internal evidence, but it may very well be a cognate of Sahaptian *-*h̄*, a type of nominalizer that fits with the semantics of the Chinookan category, and of various Oregon Penutian derivational suffixes of the same shape. I do not digress on this here.

⁶In addition, the "directional" morpheme -u- 'distad' that usually follows the pronominal complex does not appear after -wi- from {-t-l-}. This has interesting historical implications in itself, which would fill out, I believe, the reconstruction discussed.

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Wintun Prehistory: An Interpretation Based on Linguistic Reconstruction of Plant and Animal Nomenclature

Kenneth W. Whistler

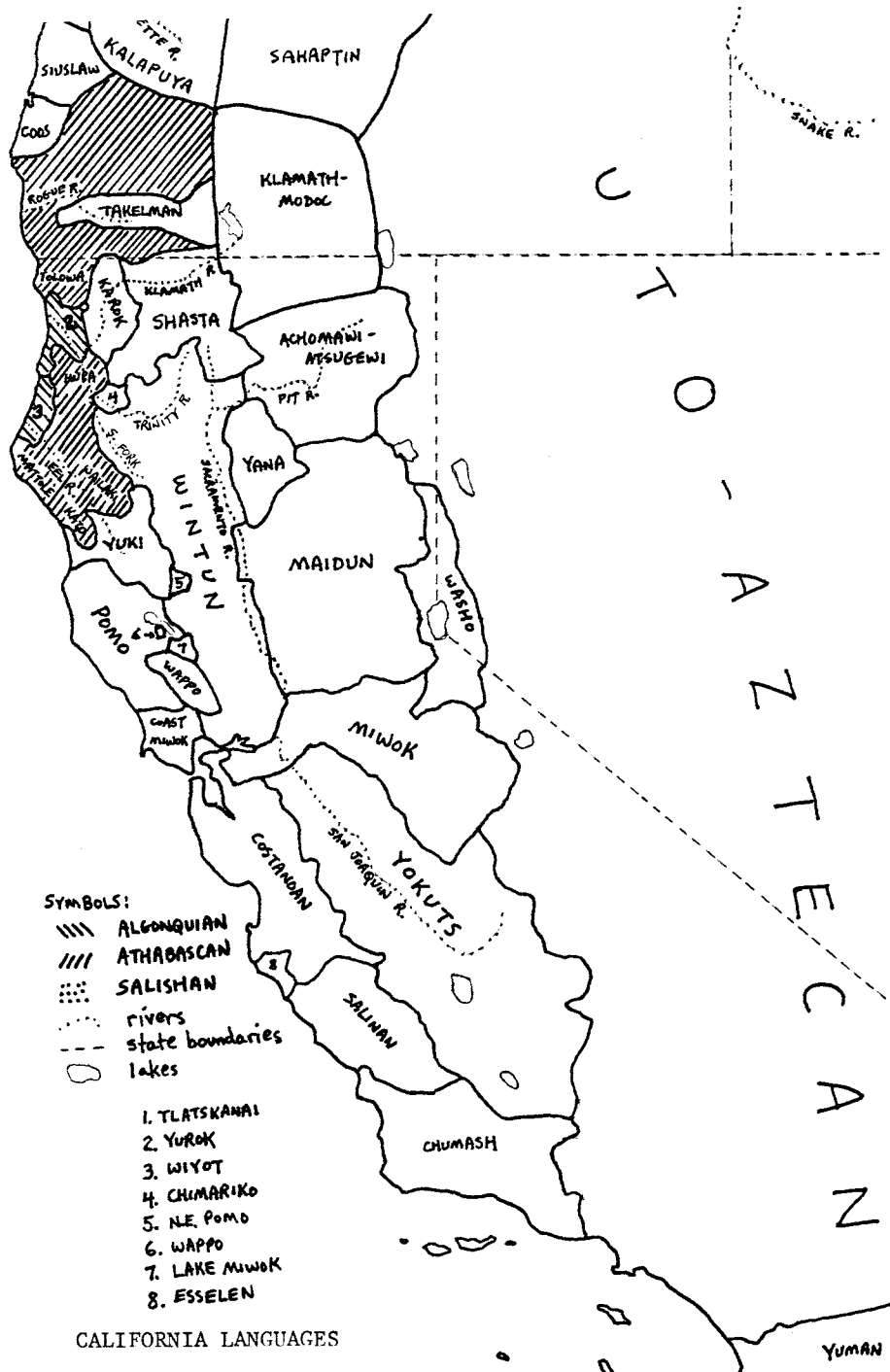
University of California, Berkeley

This paper has developed out of some rather fragmentary speculations I made in a paper at the Anthropological Association of America meeting in December 1976 (Whistler 1976b). Since that time I have followed out some of my hunches and tried to do a systematic analysis of Wintun plant and animal vocabulary in two modes: first, in an areal/geographic context and second, in a reconstructed, historical frame. In this paper I will be presenting my current understanding of Wintun prehistory, based on that analysis.

Before I present my data and conclusions, however, I wish to digress briefly for the benefit of those unfamiliar with the Wintun languages and the problems of prehistory in California. In precontact times large areas of North America were occupied by native Americans who spoke languages which have been reliably classified into a half dozen or so large language families--for example, Algonquian, Athabaskan, Uto-Aztecan, etc. However, in some areas, most notably the Deep South, Southern Texas, the Pueblo area of New Mexico, California, Oregon and the far Northwest, there were a great number of groups whose languages showed no obvious affinities with those of any other groups. In California and Oregon the classificatory problem was particularly acute. California alone, a densely populated area recently estimated to have had as many as 310,000 inhabitants in aboriginal times,² yielded no less than 21 language families or isolated languages--all but a few showing no apparent linguistic connections outside the state. I won't go into a lot of detail, but for general orientation I have provided a map of the linguistic families and isolates of California and Southern Oregon.³ The cross-hatched areas, as well as the large Uto-Aztecan area, represent linguistic groupings earlier or later shown to be related to the great eastern and northern linguistic families. Obviously the overall impression is still one of a chaos of unrelated small units.

In 1913 and 1919 Roland B. Dixon and A. L. Kroeber announced the great simplifying hypothesis that still guides the course of linguistic research on California languages. On various criteria they divided the California languages into two large stocks: Hokan and Penutian, plus a third small stock consisting of Yuki and Wappo. Penutian consisted of the five central Californian groups: Costanoan, Miwokan, Yokutsan, Maidum and Wintun. Most of the remaining, outlying language groups fell together in Hokan.

Linguists have argued about the validity of those groups for over 60 years now. At various times many of the most eminent of American linguists delved into the problem. And, in particular, the Penutian stock (or super-stock) was later considered to include all of the previously unclassified languages of Oregon, as well as Zuni in the Southwest and the Mixe-Zoque family in Mexico.



Unlike the well-established linguistic families such as Algonquian, the internal structure and historical status of the hypothetical Penutian and Hokan stocks have persistently frustrated attempts at clarification based on well-grounded comparative linguistic techniques. In balance, Hokan now seems the better substantiated, although serious questions remain unanswered in that field. Penutian, on the other hand, remains a suggestive but basically unproven hypothesis of linguistic affiliations. Some of the reasons are obvious: inadequate collections of grammatical and lexical material for many of the languages, as well as very complex areal phenomena and widespread lexical borrowing have plagued comparative analysis. Some of these frustrations led, after a flourishing of Penutian research in the 50's and early 60's, to a sudden virtual cessation of active research into Penutian affiliations.

It is my contention that one of the reasons Penutian linguistic research ran into a temporary deadend was because of an under-assessment of the crucial importance of lexical reorganization in many California languages necessitated by the large-scale population shifts of the last several thousand years. Those shifts, implied in the archaeological record, must have exposed various linguistic groups to new contact situations, led to new assimilations and borrowings, and quite possibly thrust groups into strikingly different natural environments, thus forcing both lexical innovation and decay. Additionally, the archaeological record, especially in Central California, seems to show a remarkably dynamic cultural development, including fundamental subsistence, economic, social, and ceremonial changes at several time depths. Such developments would also have caused lexical restructuring in the languages of the groups involved. Early attempts at classificatory and historical linguistics in California necessarily made numerous simplifying assumptions, one of whose effects was the implicit minimization of dynamic elements of linguistic prehistory. Now that better data and techniques are available, it is time to reexamine the assumptions and consider the possible effects of large-scale lexical reorganization.

Now I turn specifically to the Wintun case. The Wintun were a large group by California standards, consisting of speakers of about four languages who occupied all of the West Sacramento Valley, as well as much of the upper Trinity drainage on the west side of the North Coast Range crest. Those languages can be considered to form two subgroups: first, a northern subgroup consisting of Wintu proper in the north and Nomlaki (also known as Wintun) in the center; and second, a southern subgroup consisting of Patwin in Colusa and Yolo counties and South Patwin in Yolo and Solano counties. (See Fig. I for a summary.)

The standard hypothesis regarding Wintun's relation to other Penutian language families has been to consider it a coequal branch of California Penutian, which in turn showed more distant connections with Oregon and Plateau Penutian and other outlying Penutian languages. I won't review the comparative evidence for and against that formulation here.⁴ Instead, I am interested in pursuing the implications of the linguistic hypothesis for the prehistory of the

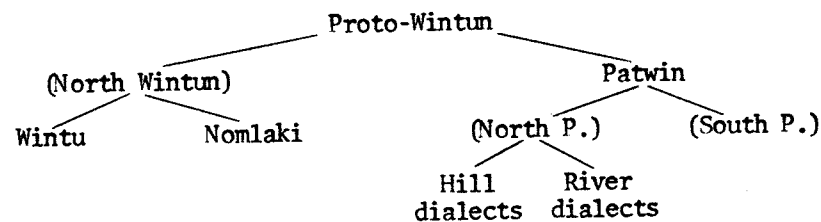
Wintun.

If the Penutian hypothesis in the broader sense and the Hokan hypothesis are correct generally, even if not in detail, the implications are as follows: Hokan-speaking groups must be assigned temporal priority in California; Penutian-speaking groups then must have originated outside of California, either to the north in Oregon or possibly out in the Great Basin. Subsequently, some of the Penutians entered and occupied Central California. That much seems fairly clear. What remains unresolved, however, is whether a Proto-California Penutian group entered California all at once and then diversified and spread within the state or whether the California Penutian families represent separate entries. Kroeber, in the California Handbook, came down firmly in favor of the former possibility. Penutian linguistic research up until about 1960 tacitly accepted that view. In the early 60's Penutian linguists such as William Shipley and Dell Hymes started emphasizing relations outside of California, but their proposals were purely linguistic, and they did not speculate on prehistorical schemata which could match the inferred linguistic relations. Currently, however, I feel that evidence is accumulating that there were not one but four separate entries by Penutian speakers into California, as I will detail towards the end of this paper.

I cannot present all of the evidence here. Instead I will be concentrating on the lexical evidence in Wintun which has a direct bearing on Wintun prehistory--in particular the evidence provided by plant and animal nomenclature. Then I will present a summary sketch of a proposed Northern Californian prehistorical sequence which incorporates the Wintun evidence.

The model of analysis I have chosen was suggested by Paul Friedrich's brilliant study of Proto-Indo-European trees (Friedrich 1970), a monument of careful philological and environmental reconstruction correlated to provide insight into both the prehistory and the dialectal connections of early Indo-European peoples. The basic method of matching reconstructible plant and animal vocabulary to reconstructed natural environments has been pursued in various ways in North America by Frank T. Siebert for Algonquian (Siebert 1967), Bill Wykoff for Iroquoian, and by Catherine Fowler in her recent article on Proto-Numic Homelands (Fowler 1972a,b).

Figure I: Rough diagram of internal relations within the Wintun family.



In applying that general method to attempt to demonstrate a northern origin for Wintun, I will be constructing a two-part argument. First, I will show that the Patwin borrowed much of their vocabulary for important Central California plant species from the Miwok, a fact which argues for Patwin origin outside the Central Valley of California. Second, I will show that the species names which reconstruct in Proto-Wintun are consistent with a familial origin in Southwest Oregon.

In pursuing this goal I have one very important thing working in my favor--the distinctiveness of the California floral province. The great Central Valley of California, where the Wintun and other California Penutian groups were centered, consisted in aboriginal times of vast marshes and grasslands, ringed almost completely by a very distinctive assemblage of oak woodland and chaparral in the foothills of the Coast Ranges and the Sierras. All of the valley and foothill plant communities have high percentages of species endemic to Central California, including many of the dominant species and many of the plants crucial in the local aboriginal food-gathering cycles.

With such a distinctive environment to be named, we should be able to spot the signs of lexical innovation in any group entering California from other areas. The argument, of course, rests on the assumption that any subsistence hunting and gathering people will either already have or somehow acquire a name for every distinctive plant and animal species which they encounter in a more than passing manner. I feel that assumption is justified by the results of ethnobiological studies of the last two decades.⁵

Now I turn to the data. In Table I, I have assembled a list of some of the most important borrowings from Miwok into Patwin. This list is far from exhaustive--it comprises just the clearest cases, including words crucial to the argument. For now I have to forgo a discussion of the means of identifying borrowed terms as borrowed. There are reasons in each case, however, for supposing Miwok to be the source language.

Items 9 through 14 may not have any direct bearing on the question of Wintun origin, but I have included them for their general interest. In particular, I believe items 12 and 13 are evidence of early borrowing before the operation of the Patwin obstruent fronting chain, a process which reorganized much of the Patwin sound system. There are also a number of instances in Lake Miwok, a language heavily influenced by Patwin, of borrowings from Patwin into that language before the effects of Patwin fronting. Those facts help corroborate phonological developments which Pitkin, Shipley and I have proposed in the Wintun family.

Items 1 through 6 are the most important for my discussion. All represent typical California oak woodland and chaparral species endemic to the state. All were species of prime economic importance in Central California. The question which these facts provoke is why should Patwin borrow terms for dominant, economically important plants. If in fact the Wintun family originated in Central California, one would expect reconstructible terms for such species. Of course that expectation presupposes a historical

TABLE I: Selected List of Patwin Borrowings from Miwok

	Miwok	-->	Patwin
1.	PMie *sak.y 'digger pine'	WPR čusak 'digger pine'	
2.	PMi *san(.)ak 'pine nut'	also WPH sakmu 'yellow pine' ?	
3.	PMie *sa.sa 'live oak'	WP sanak '(digger) pine nut'	
4.	PMi *sa.ʔa 'incense cedar' (1)	WP sa.sa 'interior live oak'	
	PMi *mo.n (?) 'incense cedar' (1)	WP mon 'California juniper'	
5.	PMi *?ej.e 'manzanita'	WPH monnon 'MacNab cypress' ?	
6.	PMi *?u.nu 'buckeye'	WP ?e.ye, ?e.ʔa 'manzanita'	
7.	PMiw *lʔme 'redwood'	WP ?u.no, ?u.nu 'buckeye'	
A.	(PMi *mul 'blue, black')	WPS loo'-mah-ne (2) [lúmani] 'redwood'	
B.	(PMi *mul 'blue, black')	WP mu.le 'blue oak'	
8.	PMis *mol.ok 'condor'	WP ʔo. 'valley oak'	
9.	PMi *čypsi- 'body louse'	WP mo.lok 'condor'	
10.	PMie *homo.- 'a fly'	WPH čhupse, čhupsi 'louse'	
11.	PMis *čuku.- 'dog'	WPR homo.tay 'a fly'	
12.	PMis *ki.li 'gooseberry' (3)	WPS čhuku. 'dog'	
13.	PMiw *cíp.a 'acorn bread'	WP čhi.li 'thistle, sticker plant, etc.'	
14.	PMi *ma.jVn ? 'chief's wife'	WP ʔipa 'acorn bread'	
		WP mayin 'chief's wife'	

Proto-Miwok forms taken from Catherine Callaghan's reconstructions (Callaghan 1972).

Abbreviations: PMi Proto-Miwok WP General Patwin
 PMie Proto-Eastern Miwok WPH Hill Patwin dialects
 PMiw Proto-Western Miwok WPR River Patwin dialects
 PMis Proto-Sierra Miwok WPS South Patwin dialects

Notes: 1. I consider Callaghan's gloss here suspect.

2. This form is from C. Hart Merriam's recordings.

3. This form may be related to the Penutian lexical set for 'horn, antler', which is one of the better candidates for a true, deep cognate set in the California Penutian languages.

continuity both of subsistence base and environment in California. The question of continuity is verifiable empirically in principle, albeit with difficulty. The evidence to date would indicate that the acorn-focussed general gathering economy of Central California has had a time depth of several thousand years. Also, the general configuration of California oak woodland and chaparral also appears to have a great time depth. Although there have been postglacial variations in aridity and an unresolved degree of interaction between the vegetation and the aboriginal inhabitants, there can be little doubt that species such as the digger pine and the live oaks have been in pretty much the same places in California for a long time, at least on a historical time scale.⁶

A note on two other dominant endemic oak species in California: the valley oak (*Quercus lobata*) and the blue oak (*Q. douglasii*), whose Patwin names are listed at A and B in Table I. Neither of those Patwin words is Proto-Wintun in depth. *mu.le* is not a direct borrowing from Miwok; however, it is quite likely related to the Proto-Miwok word *mul 'blue or black', with a Patwin innovation based on the fact that blue oak acorns have a distinctive, dark blue-black color when fresh. *lo.* 'valley oak', on the other hand, is almost certainly a lexical innovation internal to Patwin. The etymology of that word remains obscure.

In balance, the pattern of borrowing and innovation gives the impression of a people who originally spoke their language in a non-Californian environment, and who then moved into Central California and adapted to the local subsistence base. In particular, the evidence points towards a primary contact between the Patwin entering California and a Miwok group of prior occupancy.

The second part of the argument involves looking at reconstructible terminology in Wintun for plants and animals. The assumption here is that terms which can be reconstructed and assigned reliable referents in the protolanguage must refer to things present in the environment of the people speaking that language. In a sense this is the inverse of the discussion based on borrowings and innovations, since we are identifying continuities of vocabulary here rather than changes. Gaps in the reconstructed lexicon could also provide a kind of negative evidence, suggesting the possibility that the plants or animals in question were not in the environment of the protolanguage speakers. However, it must be kept in mind that, whereas the existence of a proto-form is good evidence for its referent's existence, the lack of a proto-form is only very weak evidence for a referent's absence in the environment. The arguments based on lexical borrowing rather than on gaps in the reconstructed lexicon are much stronger for demonstrating that a group at some point in time entered an environment where it lacked referring terms for some of the plants or animals of cultural relevance there.

In Table II, I have listed all of the Proto-Wintun reconstructible plant and animal vocabulary which I have been able to find so far. Obviously, not all of these forms will tell us anything distinctive or criterial about the Proto-Wintun environment. Some are basically useless for that purpose--for instance, such plant part

TABLE II

Reconstructed Proto-Wintun Plant and Animal Nomenclature

1.	*bolboloq	butterfly (-> poppy ?)
2.	*čeki	pine gum
3.	*či·r	fish (-> 'meat' in Wintu)
4.	*čil- (?)	bear (probably grizzly)
5.	*čil(čil)	bird (-> 'quail' in WPH dialects ?)
6.	*čiwil	W. fence lizard (-> 'rattlesnake' WP)
7.	*dal-	leaf
8.	*duC	cattail root (?)
9.	*dum	angelica (or other edible green?)
10.	*handVp-	common kingsnake (<u>Lampropeltis getulus</u>)
11.	*ha·w	fox
12.	*hi·n	owl sp. (short-eared or great horned)
13.	*hu·s	turkey vulture (**)
14.	*kereC	spider
15.	*kalal ^(s)	flower
16.	*kay	rodent sp. (gopher?, squirrel?)
17.	*koko(s) (?)	flea
18.	*kopV(s) ^(s)	screech owl
19.	*kuhum ^(s)	basketroot (sedge sp.?)
20.	*laq	goose sp. (**)
21.	*lasa-	spider sp. (?)
22.	*len	clover (?)
23.	*lo(·)l	wild tobacco (<u>Nicotiana attenuata</u>)
24.	*łup-	to eat acorn mush with fingers
25.	*łerew	<u>Brodiaea</u> sp. (<u>elegans</u> ?)
26.	*łet	ground squirrel
27.	*łop ~ *łop	bulrush (<u>Scirpus robustus</u>)
28.	*łuC	worm (maggot ?)
29.	*mi:	tree (lifeform term)
30.	*moł	large willow sp.
31.	*no·p	deer
32.	*nur ~ *hur	salmon
33.	*pate	mountain lion
34.	*pene(·)l	California black oak acorn
35.	*porwa(n)	gopher snake
36.	*pher-	(head ?) louse
37.	*po(t)qhom	poison oak
38.	*pu(·)r/l	wild onion sp. (<u>Allium</u> sp. ?)
39.	*qalaw	white alder
40.	*qa·q	raven (?) (**)
41.	*qo·l-tep-	poorwill or nighthawk ("mouth-open")
42.	*qho·	striped skunk

TABLE II (cont.)

43.	*qhol-	"wild sunflower" (<u>Wyethia</u> ??)
44.	*Quli-	garter snake (?)
45.	*qan-lal- (?)	bat ("armpit-stink")
46.	*sede-	coyote
47.	*se·C	basket root or any root
48.	*sumu	sugar pine
49.	*ton	willow sp., or basketsticks from it ?
50.	*taka(·)la-	cottontail (?), lizard (?)
51.	*tido·q (?)	ant
52.	*wata(·)q	tree frog (or any frog ?) (**)
53.	*yiwit	acorn soup or mush
54.	*?a·l	crow (**)
55.	*?eli	<u>Brodiaea pulchella</u> (blue dicks)
56.	*?im(il)	blackberry, any berry (?)
57.	*?iw	acorn (any)

In the reconstructed forms:

C represents an unspecified consonant

V represents an unspecified vowel

Q represents an unusual velar correspondence

(**) similar words appear in neighboring languages

TABLE III

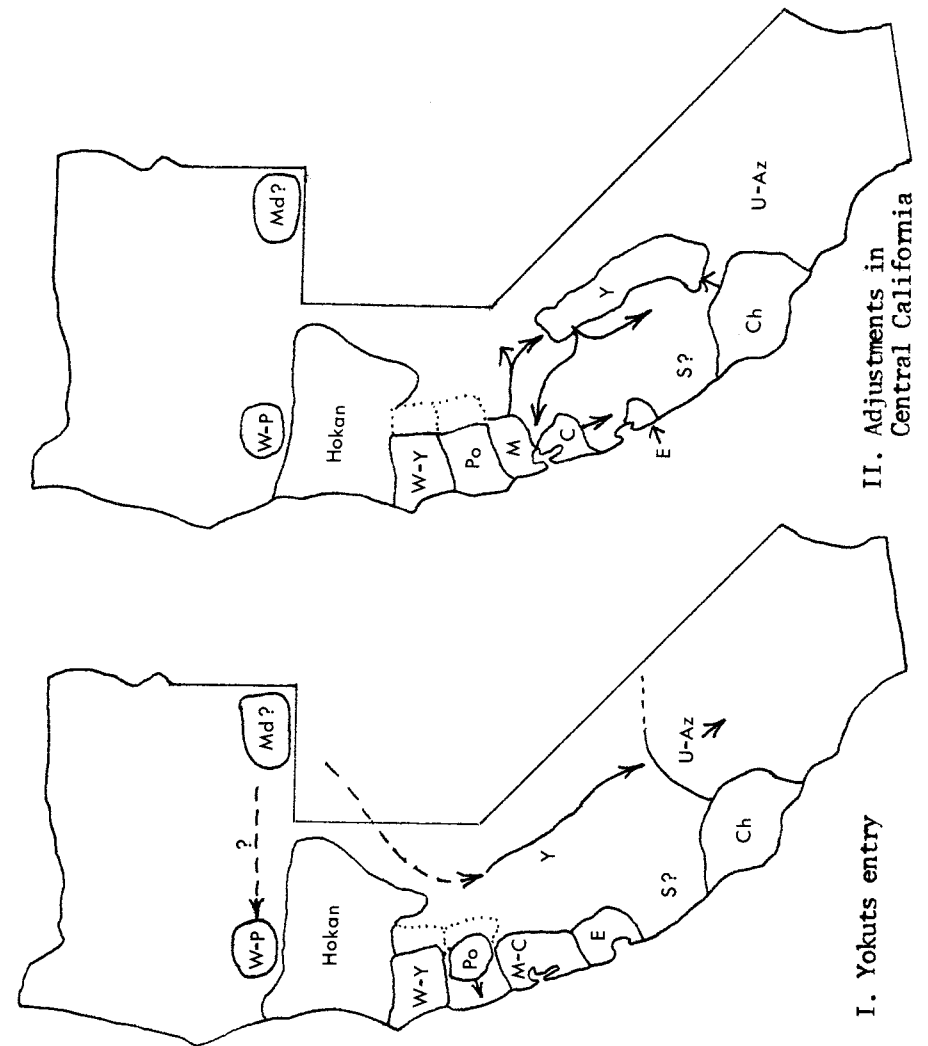
I.	Protoforms not useful	
	A. Most types of plant parts:	2,7,15,47
	B. Lifeform names animals:	3,5,14
		plants: 22,29
	C. Parasites:	17,36
II.	Protoforms potentially useful but problematic	
	A. Plant species not reasonably determined:	9,19,30,38,43,49
	B. Animal species not reasonably determined:	1,16,20,21,28,50,51
	C. Onomatopoeic problems & possible borrowing:	13,20,40,52,54
	D. Plant species ranges too widely:	8,27
	E. Animal species ranges too widely:	herps: 6,35,44,52
		birds: 12,13,18,40,41,54
		bats: 45
		mammals: 42,46
III.	Protoforms actually useful	
	A. Plant species:	23,25,34,37,39,48,55,56
	B. Animal sp. (range):	4,10,11,26,32
		(environment): 31,33
	C. Acorn & related vocab:	24,53,57

names as 'flower' and 'leaf', or lifeform terms such as 'tree'. Others are potentially useful, but still problematic for a variety of reasons. For example, it may not be possible to reliably infer the referent of the proto-form, or the form may be onomatopoeic in a way susceptible to aberrant phonological processes or borrowing, or the form itself may be perfectly fine, but refer to a species which ranges too widely to be criterial of a proto-environment--for example 'striped skunk' or 'bulrush'. In Table III, I have summarized the various criteria I have used in throwing out and sifting down the proto-forms to a useful set. What is left there in section III are the proto-forms which I believe converge to indicate a fairly specific proto-environment.

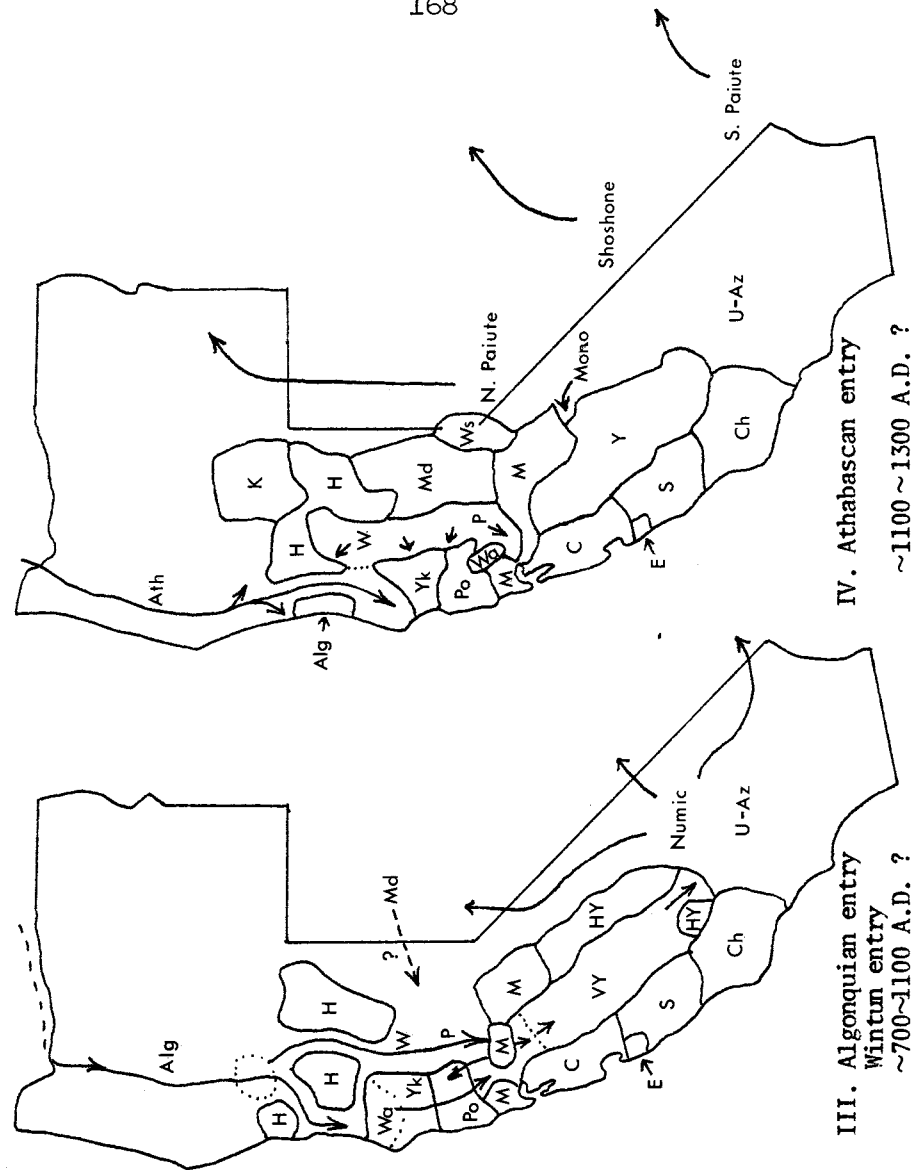
The acorn-related vocabulary in IIIC indicates that Proto-Wintun probably originated in an area with access to oaks. Of the animal terms in IIIB, 'king snake' and 'salmon' are the most specific. The king snake in particular is a very distinctive snake whose range extends only a little ways north out of California. The other proto-forms for animals are all more difficult to interpret, but they provide some information about environment. The plant proto-forms in IIIA are the most specific as to range. The black oak, the white alder, and the sugar pine are all typical California species whose range extends up out of the Central Valley north into the southwest corner of Oregon and not much further. The two *Brodiaea* species also extend north into Oregon. Wild tobacco occurred in two species in California, but the most likely identification is *Nicotiana attenuata*, a plant which ranges through Northern California into the Northwest and the Plateau. Poison oak is a cismontane species ranging from Baja north to Washington. Blackberries are of wide distribution. Two species of interest occur in Northern California and further north, but both are basically associated with forests rather than Basin or Plateau scrub.

The Wintun homeland then must meet two criteria. The reconstructible vocabulary is consistent with a homeland in cismontane California and an area extending north into the southwest corner of Oregon. It pretty much excludes the coastal forests of California and Oregon as a possibility. Second, the Wintun homeland, on the basis of the Patwin borrowing data, must be out of the range of California's foothill woodland and chaparral communities. By combining the two criteria I reach the probable conclusion that the Proto-Wintun language was spoken by a people living in interior Northwest California or Southwest Oregon. The drainage of the upper Rogue River seems the most likely candidate, with the middle Klamath or the South Umpqua drainages also possible.

I turn now to a reinterpretation of California prehistory. My reinterpretation can be followed on Maps I to IV. Much of what follows is going to be pretty speculative, and I won't be able to present all of the evidence here. In particular, for reasons of both space and time, I cannot argue and document here each individual claim about the archaeological record. I hope to present more detail about specific areas in future papers. Before I start, I wish to acknowledge the invaluable aid of Dr. Bennyhoff of Cal State Sonoma in interpreting the archaeological record for me.



SCHMATIC MAPS OF THE MIDDLE AND LATE PREHISTORY OF
NORTHERN AND CENTRAL CALIFORNIA



ABBREVIATIONS:

Algonquian	Alg	Pomo	Po	Yokuts	Y
Athabaskan	Ath	Salinan	S	Hill Yokuts	HY
Chumash	Ch	Uto-Aztecan	U-Az	Valley Yokuts	VY
Esselen	E	Wappo-Yuki	W-Y		
Northern Hokan	H	Wappo	Wa	(I wish to thank	
Klamath-Modoc	K	Yuki	Yk	Mike Nichols for up-	
Maidum	Md	Washo	Ws	dating my earlier, vague	
Miwok-Costanoan	M-C	Wintun	W-P	notions about Numic	
Miwok	M	Wintu	W	expansion in the Basin.)	
Costanoan	C	Patwin	P		

Many of the insights I will detail are basically his, but he should not be held accountable for any of the claims I make in trying to draw together a coherent schema.

The maps represent four prehistorical stages schematically. I have given rough date intervals for the third and fourth stages, but bear in mind that there is still considerable uncertainty in the radiocarbon and obsidian hydration dates for some of the sites on which sequences are based. Note also that blank spots on the maps do not imply lack of occupation. Rather, I do not as yet have sufficient evidence to make reasonable hypotheses concerning those areas. Movements on different parts of the maps are not necessarily simultaneous or causally related. Thus, in Map IV, I do not mean to imply Numic expansion at the same time as Athabaskan entry from the north; rather, that map is a convenient place to represent the late Numic expansion, pending a better relative chronology.

First, it is necessary to say a few things about California before the movements I represent in Map I. Obviously California had already had a long and complex prehistory at that point, but I don't feel it is yet possible to be very specific about sequences of population movements in that early period. Generally, however, it seems clear that Hokan speakers and the Yuki-Wappo group have temporal priority in the state. Miwok-Costanoan, which I think should undoubtedly now be considered a single family with two divergent branches, is the earliest Penutian family to enter California. Its origin is as yet obscure, but if it is genetically related to other Penutian languages, then a Plateau or Basin origin seems likely. The Miwok-Costanoans may be the people who brought mortar and pestle technology into California in the time range of approximately 3000 B.C. to 2500 B.C. At any rate, they apparently settled in an area focussed on the extremely rich estuarine environment of San Francisco Bay; they are almost certainly the people represented in the archaeological record by the so-called "Berkeley Pattern". The identity of earlier people in the Bay Area is unclear. Beeler, for linguistic reasons, suggests an occupation of the South and East Bay by a Pre-Esselen group (Beeler 1977), but the archaeological evidence is as yet insufficient to demonstrate the connection. It does seem likely, however, that the Pre-Esselens occupied a larger area of the South Coast Ranges before Miwok-Costanoan entry. Chumash seems to have been in Southern California for a long time. Pomo, likewise, has a long history of local development, probably focussed on Clear Lake in Lake County.⁷ The Yuki and Wappo may be truly autochthonous peoples, with an extraordinarily long period of settlement in the North Coast ranges. The early relations between the Pomos and the Yukis are unclear,⁸ but I consider it likely that both peoples occupied territory to the east of the crest of the coast ranges before Wintun entry into the Sacramento Valley. One last note on Northern Hokan: There is archaeological evidence for a coastal occupation as early as 310 B.C. at Pt. St. George by an early California-type culture, perhaps Pre-Karok, in what was contact Tolowa (Athabaskan) territory. This would seem to support the notion of extensive early Hokan occupation of Northwest California prior to Algonquian and Athabaskan

entry.

Now I turn to the population movements diagrammed in Map I. A hypothetical grouping of Penutian languages including Yokuts, Maidum and Wintun first breaks up somewhere on the Plateau or in the Basin. Yokuts enters Central California across the Sierras and spreads south, probably along the foothills. In the south San Joaquin Valley the Yokuts probably encounter and displace an earlier Uto-Aztecan-speaking group.⁹ The direction of movement is indicated by archaeological connections between the Yokuts and Lovelock Cave in Northeast Nevada. Gamble has argued for Yokuts entry in two separate groups, but the data may be interpretable in terms of a single entry. To the north, I suggest that the Wintun moved into the Southwest Oregon area which I have proposed as the Proto-Wintun homeland. I have no data yet to demonstrate that movement, but the linguistic connections, especially with Yokuts, argue for an earlier common origin of Wintun and Yokuts and probably Maidum (the "Pen" group of Penutian language families.)

In Map II, I show probable further movements in Central California. Apparently Miwok influence, and by inference, Miwok people themselves, spread east into the Delta and later across to the Sierras. In the North San Joaquin Valley there emerges a new archaeological pattern, the Meganos, which shows a fusion of Berkeley Pattern traits from the Bay and Windmill Pattern traits from an earlier cultural stratum in Central California. The likely carriers of the Meganos Pattern are Yokuts speakers. Approximately 2000 years ago the Meganos Pattern expands west as far as western Contra Costa County, separating Costanoan and Miwokan territory and probably isolating Karkin (Costanoan) north of the Carquinez Straits. Yokuts was also spreading southward in the San Joaquin Valley. Chumash influence in the South San Joaquin Valley increased, although it is unclear that any population movement was involved there.

Map III shows the population movements which led to another profound reorganization of Central California. The prime hypothesis relates these movements to the incursion of a technologically advanced, riverine-adapted Algonquian people from the north. These people are the most probable source of the bow and arrow and the simple harpoon in Northern California, as well as tobacco-smoking and a distinctive burial style, namely grave-pit burning. The Algonquians probably came in two groups, the ancestors of the Yurok and of the Wiyot. The exact path they took may yet be determined archaeologically, but for now I view their most likely route to have been south up the Willamette Valley from the Columbia, across the Umpqua and Rogue River drainages and then coastward along the Klamath River. The Wintun, having adopted Algonquian-style technology, move rapidly into Central California, either through or skirting Shasta territory. The first group in, the ancestral Patwin, moves all the way south into and disrupting Miwok territory. Their most likely route is south along the Sacramento River. The Patwin separate East and West Miwok groups, push Bay Miwok south of the Delta and isolate Lake Miwok. This is the period during which Patwin borrowed heavily from Miwok plant and animal vocabulary. It

seems likely that the Patwin were the carriers of the so-called "Augustine Pattern" apparent in the archaeological record. The disruption caused by Patwin intrusion thus appears to mark the archaeological development in Central California known traditionally as the middle/late horizon transition and more recently identified as the beginning of the Lower Emergent Period.¹⁰ Also indicated on Map III is a southward movement of the Pre-Wappo into their contact territory in the Napa Valley. The Wappo settled in an area earlier marked by the Berkeley Pattern (i.e. Miwok). The date of that transition to Wappo suggests a chronological correlation with Algonquian disruption of Northwest California. A word of caution about dates: On one interpretation there are dates consistent with Algonquian entry and introduction of bow and arrow as early as 300 A.D. Wappo movement seems to be considerably later than that early end of the chronological range.

Meanwhile, in the south, Valley Yokuts was still expanding. In the North Sierras, the date of Maidum entry to California is still up in the air. On the basis of borrowing and contact evidence, I prefer to posit Maidum entry after the push south by the Wintun, but the crucial data for determining timing and direction of movement are still being worked out.

Finally, Map IV shows even more recent developments. The crucial factor is Athabascan entry from the north. Unlike the Algonquians, the Athabascans seemed more adapted to rough and forested country, and their entry was probably along the coastal ranges. They pushed into Yuki, Chimariko and Karok territory and isolated the Algonquian people now living at the mouths of the major salmon streams of California. The Athabascans brought in the toggle harpoon and perhaps also sinew-backed bows. Meanwhile, the Wintun people were still expanding. In the north the Wintun expanded over the Coast Range divide into the upper Trinity drainage. In the south the Patwin apparently were extending their territory up the Cache Creek and Putah Creek drainages and south to the lower Napa Valley, further impinging on Miwok and Pomo territory. In the Great Basin, Paiutes, Shoshonis and Utes expanded over a vast territory fairly recently. In particular, the Monache probably crossed the Sierra divide into Northern Hill Yokuts territory as recently as 500 years ago.

This prehistorical synthesis is still a first-order approximation, rough in many of its details. It is intended for criticism and discussion, especially by the archaeologists with expertise in cultural sequences and dating in various parts of California. The California archaeological community is already engaged in an active debate concerning cultural sequences in the Sierras and North Coast Ranges, so some of these ideas should not be too surprising to them. For now, it should be of interest to them that my interpretation of Wintun origins and Patwin intrusion into Miwok territory is consistent with Bennyhoff's interpretation of the middle to late horizon transition in Central California.

For the community of California linguists, however, I believe that this synthesis represents a more radical departure in direction. Up to now the archaeological data have been hard to

interpret or make relevant to discussions of linguistic prehistory. But as California archaeological models become more specific, and even more importantly, as definite linguistic groups become recognizable in careful analysis of the archaeological assemblages, archaeology is emerging as contributing crucial boundary conditions on the range of possibilities of linguistic prehistory.

Some of the more important conclusions which I must draw are the following: First, I now consider the hypothesis of a California Penutian kernel dead. It is inconsistent with the linguistic borrowing data, with expectations based on other historical linguistic principles, and most crucially, with the cultural sequences implied in the archaeological record. Penutian entry to California must have occurred in several stages and likely from different directions. Second, several critical gaps in the linguistic data are now becoming clear. We need an interpretation of the prehistory of Maidun which can serve to show either connections with the Basin or with the Central Valley. Yokuts, as an earlier entrant, now looms as the essential key to understanding all of South Central California. Investigation of the Wintu to Northern Hokan connections in Northern California is crucial for making sense of that end of the state. And a systematic survey of all provable and suspected linguistic borrowings in California could clarify most of the intergroup connections immensely. Third, we have to get used to not seeing California as a linguistic island. Connections with the Northwest, with the Basin across the Sierras, and with the Southwest across the desert are emerging as integral parts of California prehistory. Finally, the recency of change in Northern California is an important notion to internalize. We have been used to thinking of the archaic side of the California linguistic situation, but evidence is accumulating which shows a nearly complete reorganization of the North Coast Ranges and the Sacramento Valley in the last thousand years. That is recent enough to leave systematic, recoverable traces in the languages of the people involved, if we know what we are looking for.

NOTES

1. This paper has emerged from numerous informal discussions with linguists and archaeologists working in California. I wish in particular to thank James Bauman, James Bennyhoff, Catherine Callaghan, Larry Dawson, Geoffrey Gamble, Victor Golla, Richard Levy, Sally McClendon, Marc Okrand, Harvey Pitkin, William Shipley, Sonia Tamez, and Henry Zenk for their input of ideas and their criticism of my formulations. Of course they are not responsible for my reinterpretations of their ideas or for any errors which I may have made. Also I extend my thanks to Mary Haas for her generous support through the Survey of Californian and other Indian Languages. And last but not least, I thank the Patwin people who helped me with their language: Oscar McDaniel, Jennie Regalado, and Harry Lorenzo.
2. There has been a great deal of controversy regarding the pre-contact population of California. I have relied on Cook's estimate of 310,000 (Cook 1976), which is based on a much more complete

survey of material than Kroeber's earlier estimate of 125,000.

3. This map is not intended to be a definitive update of the California linguistic map, although such an update is clearly needed. It is based largely on Kroeber's (1925) map of California, with a few changes to make it fit the results of research by Beeler, Callaghan and others on the geography of Miwok, Costanoan, and Chumash languages. I have also modified the Maidu-Wintun boundary to accord with Kroeber's own data on Sacramento River settlement. The placement of South Oregon languages is based on an unpublished map by Victor Golla. Cf. also Bennyhoff (1977) and King (1975).

4. See Gamble (1973) and Okrand (1974) for the most complete recent reviews of the history of the Penutian hypothesis and the current state of Penutian studies in California.

5. In Whistler (1976a) I discuss Patwin plant and animal nomenclature in a folk-biological framework. Included there is a partial bibliography of recent folk-taxonomic studies which have a bearing on the question of what gets named in the environments of cultural groups.

6. Palynographic evidence for vegetation change is sparse in Central and Northern California. However, a 100,000 year record from the sediments of Clear Lake (unpublished data of Dave Adam of USGS at Menlo Park) shows major changes of vegetation prior to and during the most recent glaciation. The top portion of the core--the last 8000 years or so--suggests a relatively stable environment in the area around Clear Lake during the Holocene, although the temporal resolution for that time span is not good (Roger Byrne, personal communication). For my present discussion, relative environmental stability for just the last 3000 years or so is sufficient to demonstrate my points regarding the Wintun.

7. McClendon (1973) shows that Proto Pomo has at least five reconstructible terms for oak species--one for all but one of the large oak species around Clear Lake. That suggests a long local history and contrasts markedly with the situation for the Wintun, whose oak vocabulary is marked by borrowings and innovations for California species.

8. Clarification of Pomo and Yuki prehistory awaits further research in the North Coast Ranges. In particular, a better spatial, temporal, and cultural definition of the Borax Lake Pattern might make it possible to affiliate it with either Pomoan or Yukian peoples. In proto-historical times at least, the Northern Pomo were almost certainly encroaching on Yuki territory, while the Wappo were expanding into Southern Pomo territory.

9. See Fowler (1972b) for corroboration on this. She identifies the South Sierras as the most likely center of early settlement and dispersal of the Northern Uto-Aztecan peoples.

10. See Fredrickson (1974) for a discussion of his chronology for Central California.

