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COORDINATION: AN IMPORTANT PRINCIPLE OF SAHAPTIN FOLK BIOLOGICAL CLASSIFICATION AND NOMENCLATURE

EUGENE HUNN

UNIVERSITY OF WASHINGTON

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Based on limited comparative data, Berlin proposed a set of universals of folk biological classification and nomenclature (1973; Berlin, Breedlove, and Raven 1973). These proposed universals have provided the framework for most subsequent studies of folk biological classification systems. His proposals have been supported (Hunn 1974, Hays 1974, Brunel 1974), extended (Brown 1977, 1979; Brown et al. 197), criticized (Hunn 1976, 1977; Bulmer 1970, 1974; Randall 1976), and revised (Berlin 1976). The present paper is intended as both critique and extension of this point of departure. I will argue that the taxonomic principle of inclusion, by which taxa at one level or rank are included in those of a higher level or rank--basic to the Berlin hierarchic scheme of folk biological classification (as to the Linnean)--is but one way to organize a set of folk biological taxa. Furthermore, the associated binomial naming principle is but one way to indicate nomenclaturally structural relationships within folk biological classification systems.

FIGURE 1. A Schematic Illustration of a Taxonomic Hierarchy

My recent research with Sahaptin-speaking Indians of the Columbia Plateau region of the Pacific Northwest has shown Sahaptin to be an unusual case in comparison with those previously described. Plant and animal classification by my Sahaptin-speaking consultants exhibits an extraordinary lack of hierarchic structure. In fact, the system closely approximates the null point of taxonomic hierarchy, the single level system. Berlin postulated that such a system should represent the initial stage in an evolutionary sequence of development of folk taxonomies (1972), but he cited no examples of "very early" systems.

Following Berlin's lead, Brown (1977, 1979) has sought to demonstrate that named life form taxa--inclusive taxa at a level above that of the basic folk taxonomic level, the "folk generic" of Berlin--are added progressively

to the folk biological inventories of the world's languages. Sahaptin is at a very "early stage" of development, according to Brown's analysis, with but a single botanical and a single zoological life form named, i.e., 'tree' and 'bird.' Of 217 cases sampled by Brown, only 6 have as few (5) or fewer (1) life forms (1977:324; 1979:796).

The minimal degree of hierarchic development in Sahaptin is even more apparent when the folk specific taxonomic level is examined. Berlin has compared a number of well documented folk botanical and zoological systems in terms of the per cent of basic level taxa (=folk generic taxa) subdivided by subordinate "folk specific" taxa (1976). He reported the following:

Chacan Quechua plants	11%	(Brunel 1974)
Ndumba plants	14%	(Hays 1974)
Tzeltal Mayan plants	16%	(Berlin, Breedlove, and Raven 1974)
Tzeltal Mayan animals	17%	(Hunn 1977)
Aguaruna Jívaro plants	18%	(Berlin n. d.)
Hanunóo plants	43%	(Conklin 1954)

With the exception of the Hanunóo, there is a startling degree of consistency to these statistics.

These folk specific taxa are recognized as such by virtue of a characteristic nomenclatural pattern, that is, binomial names consisting of a head constituent naming the inclusive folk generic taxon modified by an attributive constituent, are systematically employed to label the subdivisions which partition the generic taxon. The Tenejapa Tzeltal classification of robins (Turdus spp.) is exemplary (see Figure 2). This naming pattern,

FIGURE 2. The Tenejapa Tzeltal Classification of Robins

of course, has been adopted as the cardinal nomenclatural rule of scientific biological taxonomy since Linnaeus.

Sahaptin stands in sharp contrast to all these systems. The frequency of generic polytypy for plant and animal taxa combined (excluding obviously recent coinages) is less than 1%, that is, only one of 213 plant generic taxa includes binomially named folk specific subdivisions, while three of 236 animal generics do so. It would be misleading, however, to conclude that Sahaptin-speakers fail to perceive structure within their biological domains or that they have no way of indicating nomenclaturally the structure they perceive. I will describe two regular nomenclatural patterns employed in Sahaptin to indicate relationships among folk biological taxa. Both are more frequently employed than is binomial naming in Sahaptin folk biology. Both indicate relations of similarity or of "kinship" between pairs of taxa. This relation is one of coordination between taxa in direct contrast (cf. Kay 1971) as opposed to the relation of subordination between a generic taxon and the specific taxa it subsumes.

METHODS OF DATA COLLECTION AND ANALYSIS

To understand the significance of these statistical comparisons, it is first essential to describe the process of data collection and analysis from which these statistical results derive. In the Sahaptin case I have consulted a variety of sources: 1) the naming responses of Sahaptin-speaking consultants to individual plants and animals examined in situ or as pressed specimens; 2) discussions with consultants (conducted in English) of the characteristics of plants and animals (named in Sahaptin); and 3) comparable data reported by colleagues (D. French, V. Hymes, B. Rigsby, H. Schuster) and ethnographers and linguists (M. Jacobs, E. Curtis, M. Pandosy, W. Everette). These data are of diverse quality. However, in the aggregate they represent several thousand instances of the naming of plant and animal taxa.

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The key methodological issue is the operational definition of a name. In particular, names must be distinguished from more ephemeral constructions such as descriptive phrases, nonce forms, and idiosyncratic naming preferences. Though a name may be constructed of two or more words, it is a single lexeme (Conklin 196), that is, it functions as a semantically autonomous unit in the context of reference. Thus, "silverfish" is not a "fish," and a "black bird" is not "a bird which is black." For present purposes, a name must also reflect some degree of consistency of application across individuals and naming events. I have established the criteria that a name must be employed consistently by at least two individuals on at least two independent occasions with the same referential meaning, to be counted here.

We are also interested here in a particular class of names, that is, those which indicate syntactically a formal relationship between the taxon named and some related folk biological taxon. Such names will be morphologically compound and thus particularly difficult to distinguish from lexically compound expressions of parallel syntactic composition. English are names of this class/typically (if not exclusively) of binomial form, as for example, "big-leaf maple" and "hammer-head shark." Such names must be carefully distinguished from descriptive phrases, such as "moss-draped maple" and man-eating shark." They must also be distinguished from metaphorical look alikes, such as "poolshark" and the aforementioned "silverfish." The binomial form of these names consistently indicates that the taxon so named is subordinate to the taxon named by the head constituent of the name.

Parallel naming conventions have been described for a number of languages unrelated to English, and the pattern may be universal (Berlin, Breedlove, and Raven 1973). The lexemic typology devised by Conklin (1962), since refined by Berlin (1973), recognizes the binomial name form

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of privileged status, and the class inclusion relations indicated thereby as the fundamental principle of folk biological classification. The generality of binomial naming in folk biological nomenclatural systems, plus its incorporation as the basis of scientific biological nomenclature, has obscured the fact that this naming convention is but one of several naming patterns which may indicate structural relations among taxa.

In Sahaptin there are three nomenclatural patterns commonly used to reflect two distinct types of formal relation among taxa. Binomial nomenclature used to indicate class inclusion is one of these, but is less frequently used than two other naming patterns which indicate relations of class coordination, a relationship sometimes refered to metaphorically by Sahaptin consultants in human kinship terms, as for example, when dog, coyote, and wolf are said to be náymu 'relatives/friends." The first of these naming patterns is superficially binomial, in that the name is formed of the modified name of a second taxon, which remains unaltered as the head constituent. In each case the attributive constituent is the bound suffix -wáakuł which may be glossed 'resembling.' For example, c'iiławáakuł is used to name Belding's ground squirrel (Citellus beldingi), while c'iiłá [c'ii (onomatopoetic) + -łá (agentive)] names Townsend's and Washington ground squirrels (C. townsendii, C. washingtoni). Consultants using this naming convention (one each from John Day and Umatilla dialects) distinguish Belding's on the basis of size, calls, and range. The suffix -wáakuł is also frequently employed to indicate the fact of similarity in a descriptive context, as when the color of a horse is described as wiwnuwáakuł 'huckleberry-like.'

The second Sahaptin syntactic convention used in biological naming is reduplication, often combined with ablaut. This is a highly productive syntactic feature of Sahaptin (Jacobs 1931: , Rigsby n.d.) indicating

variously diminu^tion, distributive plurality, and--as here--the status of "younger sibling," i.e., the resemblance of a conceptually peripheral taxon to one more central or salient. For example, k'usík'usi 'dog' is derived by this process from k'úsi 'horse.'[fn] This naming process is not restricted to recently introduced species such as the horse, as it is used, for example, in naming a species of huckleberry-relative which is a traditionally favored food item, wiwlúwiwlu 'grouseberry' (Vaccinium scoparium Leiberg), derived from wíwnu 'black mountain huckleberry' (V. membranaceum Dougl.), the archtypical fruit for Sahaptin speakers. The status of such forms as true names is suggested by the fact that the nonce form wiwluwiwluwáakuł has been recorded (in response to an ambiguous Vaccinium specimen), as has the binomial tanán sɨt'x̣ʷswáakuł, literally, 'Indian corn.'

A DISCUSSION OF THE SAHAPTIN CASES

Binomial Names

The Sahaptin use of binomial nomenclature is sporadic, at best, and at times appears to be actively avoided. The single unambiguous case in the plant domain involves the recognition of two species of raspberry:

- šáx̣at
  - čmúk šáx̣at, lit. 'black raspberry'
  - luc'á šáx̣at, lit. 'red raspberry'

Since the red raspberry (Rubus idaeus L.) is rare in the Sahaptin range, the unmodified generic term šáx̣at is normally used to label the common blackcap raspberry (R. leucodermis Dougl.) (cf. Curtis 1911:). Chokecherry classification presents a strong contrast. Chokecherries (Prunus virginiana L.) provide an important traditional food. The cherries vary in color from red to black, but discontinuously so that three color types are readily recognized. Modern-day Sahaptins are aware of this variation but refuse to apply

binomials to label the variants, even when prodded to do so. They assert that this variation is of no significance.

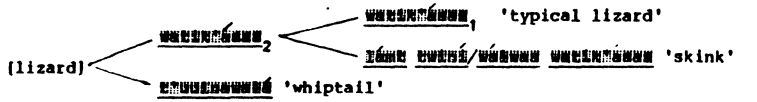
The three acceptable examples of binomial naming applied to animals are neither very widely nor very consistently used. Two informants distinguished the rare snowy owl (Nyctea scandiaca) as [illegible] [illegible], literally, 'white large owl.' Unmodified [illegible] is focused on the great horned owl (Bubo virginiana), the most common and the most powerful owl in the region. However, the term may also be applied to other medium to large owls, such as the Barn Owl (Tyto alba) and short-eared owl (Asio flammeus), though this may simply indicate that contemporary speakers have never learned the "proper" names for these owls. This naming pattern might suggest that the snowy owl is considered a kind of great horned owl, but such is not the case. The snowy owl is rather seen as a related, but coordinate form, on the same taxonomic level. The situation might be interpreted taxonomically if we were to posit two polysemous senses of [illegible] (cf. Berlin 1976: 391-392), as follows:

- [illegible]$_2$ 'large owl'
  - [illegible]$_1$ 'great horned owl'
  - [illegible] [illegible] 'snowy owl'

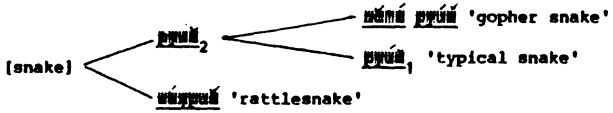
However, this interpretation is purely hypothetical, the justification for positing two polysemous senses of [illegible] solely in order to preserve the taxonomic hierarchic form.

Typical lizards are called [illegible], a name which applies with equal force and without modification to alligator lizards (Gerrhonotus spp.), fence lizards (Sceloporus spp.), and the side-blotched lizard (Uta stansburiana). The western skink (Eumeces skiltonianus) is singled out as [illegible] [illegible]/[illegible] [illegible], literally, 'blue-tailed lizard,' by two consultants from contrasting dialect groups. The skink's tail is used as a good luck charm in gambling. Two lizards are not included in [illegible], but are contrasted at the generic level: [illegible], from [illegible]- 'to dig roots,' is the short

horned lizard (Phrynosoma douglassi) and [redacted], literally, 'jumper,' is the rare and local western whiptail (Cnemidophorus tigris). Both are morphologically divergent, and the horned lizard is considered to be an "Indian doctor" worthy of special respect and protection. Its relationship to the other lizards is not clearly recognized.



Typical snakes are called [redacted], with the abundant garter snakes (Thamnophis spp.) considered unexceptional examples. This name may also be applied, as is, to the racer (Coluber constrictor) and the gopher snake (Pituophis melanoleucus), two other common species. However, the gopher snake is named [redacted], literally, 'big snake,' by at least three consultants of as many dialects. Others, however, apply the contrasting generic term [redacted] to this species (Johnson-O'Malley 1977). Single consultants have used additional binomials to distinguish garter snakes and racers. The western rattlesnake (Crotalus viridus), another "Indian doctor," is not considered to be a kind of [redacted], but the connection is not apparent to contemporary Sahaptin speakers. Thus 'snake' remains a covert category.



All three cases of binomial nomenclature in the zoological domain involve a minimal development of the specific contrast set. In each case a binomial name is applied to a single exceptional "species" within a folk genus--or to a coordinate form in the case of the snowy owl. The other member(s) of the genus are not distinguished by a parallel binomial. Thus it is necessary to postulate an unmarked polysemous type specific category if a hierarchic taxonomy is our structural model.

Expressions of Binomial Form which are not Valid Specific Names

Binomial generic names have not been included above (very few cases are known for Sahaptin), in accord with Berlin's distinction (1973:) between productive composite names, such as "mockingbird," and "secondary names," the true binomials, such as "bald eagle." One example of some currency in Sahaptin is [redacted] 'Chinook salmon,' more usually rendered as simply [redacted]. The named intermediate taxon [redacted] 'anadromous salmonid' includes up to seven folk generic categories, but spontaneous binomial combinations have been recorded only for [redacted] (the prototype of [redacted]).

The inverse of the preceding example is presented by [redacted] 'horse,' in which more than twenty varieties are recognized nomenclaturally by contemporary consultants. However, these folk specific taxa are rarely labeled binomially, for example:

[redacted], literally, 'Mormon,' the Appaloosa

[redacted] 'palomino'

[redacted] 'bay,' from [redacted] 'red'

[redacted], literally, 'huckleberry-like,' for "huckleberry roan"

Though it is acceptable to say [redacted], such binomial variants are rarely noted in normal naming contexts or in conversation, even when the modifier is a widely used adjective such as [redacted] 'black,' or 'black horse,' according to context. In a few instances there is a further subdivision of specific horse names into varieties which may be named binomially, as for example, [redacted] 'black roan.' However, consultants rarely agree on these designations. Sahaptin horse classification illustrates an unusually elaboration with parallels in the naming of cats and dogs by English pet fanciers (Gal 1973).

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Also excluded are cases in which a heterogeneous folk generic taxon is frequently further specified binomially, but idiosyncratically or without referentially consistency. The naming and classification of willows (Salix spp.) in Sahaptin is complex and ambiguous. The largest tree-like willows (S. amygdaloides Anderss., S. lasiandra Benth., in part, at least) are singled out as [illegible]; they are particularly favored for long-house framing. All small shrubby willows (Salix exigua Nutt., S. rigida Muhl., some S. lasiandra) as well as introduced tree-sized willows (S. alba L., S. babylonica L.) are called [illegible]. This term is often modified, e.g., [illegible] 'gray willow,' [illegible] 'white willow,' [illegible] 'mountain willow,' etc. However, no consistent correspondence is apparent between a particular type of willow and any of these binomial expressions.

Finally, I have excluded cases involving recently introduced species. The binomial expression [illegible] 'Indian X' is used by a few informants to distinguish native forms from related introduced forms. For example, one informant contrasts [illegible] 'Indian onion,' the wild species of Allium, with [illegible] proper, which for this informant is restricted to garden onions. Another individual refered to an ear of varicolored "Indian corn" as [illegible], literally, 'Indian corn.' However, these usages are sporadic and idiosyncratic. Several consultants distinguish black-tailed jackrabbits (Lepus californicus) from their white-tailed cousins (L. townsendii).

[illegible] — [illegible], literally, 'white tail jackrabbit'

[illegible] 'black tail jackrabbit'

Consultants are quick to note that the black-tailed species is a modern-day intruder, having expanded its range north of the Columbia River in the past 60 years. However, it is possible that this distinction has some antiquity in the Oregon dialects.

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The Suffix -[illegible] '-Like'

This naming convention is much more frequently used in botanical names than in the zoological. Our single animal case is the ground squirrel example cited above:

[illegible] 'Townsend's and Washington ground squirrels'

└ [illegible] 'Belding's ground squirrel'

Plant examples are as follows:

[illegible] 'Claytonia lanceolata Pursh'

└ [illegible] 'Montia sibirica (L.) Howell'

The first named is an 'Indian potato,' the second a striking look-alike and relative lacking underground tubers. In fact, this characteristic is the primary trait used by botanists to distinguish Claytonia from Montia. This use of [illegible] was first recorded by Gunther during a 1935 ethnobotanical survey in western Washington (1973:29) and is still current on the Warm Springs reservation in eastern Oregon (D. French, personal communication).

[illegible] 'antelope brush' (Purshia tridentata [Pursh] DC.)

└ [illegible] 'mountain mahogany' (Cercocarpus ledifolius Nutt.)

These two are large shrubs or small trees of the rose family; the unmarked form is widespread; the marked form is found only on the southeastern fringe of the Sahaptin range.

[illegible] 'red cedar' (Thuja plicata Donn.)

└ [illegible] 'incense cedar' (Calocedrus decurrens [Torr.] Florin.)

This case is precisely parallel to the preceding; two tree species of the cypress family, the unmarked species common (and of great utility), while the marked form is known only in the southwestern corner of the Sahaptin range.

[redacted] 'syringa' (Philadelphus lewisii Pursh)

└── [redacted] 'snowberry' (Symphoricarpos albus [L.] Blake)

These two shrubs are not closely related, though they share the characteristic of opposite leaves. Both are common, widespread, and useful, the former as a durable wood, the latter medicinally. Snowberry's "junior status" as the marked form may be due to its shorter stature and smaller leaves and flowers.

[redacted] 'strawberry' (Fragaria spp.)

└── [redacted] 'Geum triflorum Pursh'

These are two herbaceous plants of the rose family. The marked form is used medicinally; the unmarked 'strawberry' bears edible fruit.

[redacted]* 'big sagebrush' (Artemisia tridentata Nutt. in part)

└── [redacted] 'dwarf sagebrush' ("A. vaseyana," a montane ecotype of A. tridentata, and A. arbuscula Nutt.)

These are all closely related shrubs. The unmarked type is abundant at lower elevations, occasionally attaining the stature of a small tree. The marked variant is dwarfed by high elevation ("A. vaseyana") or impoverished soils (A. arbuscula).

[redacted] 'chokecherry' (Prunus virginiana L.)

└── [redacted] 'bitter cherry' (P. emarginata [Dougl.] Walp.) and 'domestic cherries' (P. cerasus L., etc.)

The conceptual priority of the chokecherry presumably is due to its value as a highly favored food.

Two additional examples of the use of plant names modified in this way are the terms for corn and tomatoes, both introduced domesticates (though corn

may have been known to Sahaptins before Euro-American contact). Corn is universally known as [redacted]; its namesake [redacted] is a plant of the lily family, Brodiaea hyacinthina (Lindl.) Baker, valued for its edible corms. The resemblance perceived, however, is not between corn and the lily as plants, but in the form of the edible portions of each, the kernal of corn fancied to resemble the corm of the lily. Our second example is precisely comparable. The introduced tomato is often called [redacted] 'rose-hip-like,' and indeed a tomato's fruit bears a substantial superficial resemblance to the fruit (hip) of the native roses. These two cases are intermediate between the instances described above in which two taxa are closely related conceptually on the basis of overall morphological resemblance, and instances in which the perceived resemblance is based on some single characteristic shared by the "prototype" and the model, as when a "huckleberry roan" is called [redacted] 'huckleberry-like.'

Reduplication

This naming pattern is less frequent than the preceding, but is used in the same way to link an unmarked prototype to a marked form (or forms) perceived to be closely related. Botanical examples include the huckleberry case already cited:

[redacted] 'black mountain huckleberry' (Vaccinium membranaceum Dougl.)

└── [redacted] 'grouseberry' (V. scoparium Leiberg)

The prototype produces a highly valued staple fruit; the grouseberry is also eaten, but is more an occasional treat than a staple. It is also dwarf in stature and bears a diminutive fruit. In certain dialects of Sahaptin the larger native onions are called [redacted], while the low growing species are [redacted]:

[redacted] 'large wild onions'

└── [redacted] 'small wild onions'

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This contrast (or a similar one) is handled differently in other dialects, in which the larger wild onions of wet meadows are called [illegible], the smaller, low growing rock onions are called [illegible] (from [illegible] 'rocky flat').

Zoological examples include the following:

[illegible] 'typical Chinook salmon' (Oncorhynchus tschawytschwa, part)
└ [illegible] (O. tschawytschwa, part)
'jack Chinook salmon'

The "jack" of the Chinook salmon is a population of that species which returns to spawn a year earlier than is typical of the species. They are identified by their small size. It is not considered a kind of [illegible], but a "species" of salmon ([illegible]) in its own right. The next two cases are closely parallel:

[illegible] 'head louse' (Pediculus humanus capitatus)
└ [illegible] 'small swarming invertebrates'

Examples of the latter include aphids and mosquito larvae.

[illegible] 'large biting fly, especially the horse flies (Tabanus spp.)'
└ [illegible] 'gnats'

Our final example is the intriguing case of the horse and dog. Contemporary Sahaptin speakers (as well as those who served as Father Pandosy's informants in 1850) call the dog [illegible], literally, 'little horse.' However, the horse is the more recent introduction (Haines 1938), while dogs are known from the Pacific Northwest archaeologically since 10,400 BP (Lawrence 1968, 1970). It must have been the case that [illegible] originally referred to the dog; that horses were likened to dogs due to the comparable role they came to play in human social economy as highly useful and esteemed (but inedible) pets. The horse's large size and rapid incorporation as an essential mode of transport and currency of social exchange apparently produced the semantic shift now evident.

[illegible] 'horse'
└ [illegible] 'dog'

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This structural pattern--marked by reduplication and the suffix -[illegible] in Sahaptin--may also be implicitly recognized. In each of the following cases a heterogeneous folk generic--often but not always involving a distinct prototype--has a closely associated satellite generic, which, if not named in its own right, would be subsumed within the "sphere of influence"/of the prototype. (cf. Bright and Bright 1965) Typically this satellite generic is of outstanding (or special) cultural significance (five of seven cases):

[illegible] [T, R] ant in general with a fucus on large mound building Formica sp., except for,
└ [illegible] small black ants;

[illegible] snakes in general, except for
└ [illegible] 'rattlesnake;

[illegible] willows in general, except for
└ [illegible] large native tree-sized willows useful for longhouse framing;

[illegible] 'typical lizards'
├ [illegible] 'whiptail lizard'
└ [illegible] 'horned lizard';

[illegible] spider in general, except for
└ [illegible] 'black widow spider, especially the female';

[illegible]$_2$ ← [illegible]$_1$ 'mallard'
[R] [illegible] other ducks in general, except for
└ [illegible] 'Common Merganser.'

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Discussion

We have examined 18 legitimate cases (and a number of additional cases not quite legitimate) in which pairs of taxa conceived to be related are linked nomenclaturally. In all cases the pattern is similar: the prototypical taxon provides the nomenclatural base for the peripheral relative. This pattern is obvious in the cases of reduplication (N = 6) and the use of the suffix -[redacted] (N = 8). It is somewhat less clear in the binomially labeled cases. However, at least in the case of the snowy owl, the marked name ([redacted]) carries no implication of taxonomic subordination to the unmarked prototype ([redacted] 'great horned owl'). Thus 15 of 18 (83%) of these cases of "structural implication in naming" involve conceptual coordination between basic level taxa rather than hierarchic subordination between taxa at higher and lower levels or ranks of a taxonomy.

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The most appropriate cognitive model for all of these cases is not that of a vertical taxonomic hierarchy of inclusion relations, but rather that of a horizontal prototype-field structure. Such an alternative is not new. Bright and Bright described elements of Northwest California Indian plant classification in such terms in the 1960's. Gardner has likewise used such a model to describe Dene bird classification (1976). The fundamental relationship generating such structures is that of similarity and difference, not set inclusion. I have argued elsewhere that taxonomic hierarchy may be epiphenomenal to the recognition of such relations of similarity and difference among organisms (1976).

Recently a new formalism has been proposed to deal with these non-hierarchical relations. This is "fuzzy set theory" (Zadeh 1965, Kay and McDaniel 1978, Hunn 1978, Kempton 1978, 1979, 1981). Taxonomic hierarchies have been defined in traditional set theoretic terms (Gregg 1954, Kay 1971, Hunn 1975) in which taxa are defined as sets of organisms and taxonomic relations are set inclusion relations among taxa. The inadequacies of such a formulation for describing folk biological classification have been noted (Hunn 1976, Kay 1976, Randall 1976). Fuzzy set theory appears to overcome some, if not all, of these problems. Fuzzy set theory is actually a more general theory encompassing traditional set theory as a special case. In traditional set theory, an element either is or is not a member of any given set. In fuzzy set theory, an element may be a member of a fuzzy set to some degree, represented by a number which may vary between zero and one. Such a model is obviously appropriate to describe a set such as "tall men" (cf. Lakoff 1972).

In applying this formalism to folk biological taxonomies, we recognize the fact that the degree of membership of an oak or a willow in the life form taxon "tree" may vary, as some perfectly good oaks and willows are quite shrubby. Such an approach seems useful as a model of prototype-

field structures. The prototypical members or subsets are full-fledged members (membership degree = 1.0), while peripheral but coordinate taxa will have some less than perfect degree of membership in the field epitomized by the prototype. In the case of satellite taxa in which the link to the prototype is implicit (the prototype may be recognized as such by virtue of its obviously greater salience within the field), we may see how an instance / may have of the satellite taxon of degree of membership in the field greater than zero but a higher degree of membership in the satellite. In such a case, it is understandable that informants have difficulty answering the standard query, is X a kind of Y? Kempton suggests (1981: 26-30) that more useful results may be forthcoming if we modify this query using native language hedges, uch as "is X a typical Y?", "is X sort of a Y?", etc.

Defining categories with respect to prototypes, of course, begs the question of why a particular prototype should be focal, while another is peripheral. Among the 25 cases (18 with structure-defining names, 7 others satellites implicitly linked to a prototype) considered here, the peripheral taxon was the smaller in 8 cases, less common or peripheral / in range in 4.3 cases (when a case exhibits more than one criterion it is "divided" among each criterion equally), atypical morphology or behavior in 2.8 cases, and outstanding or special cultural significance in 9.8 cases. (see Table 1)

Berlin in a very perceptive article speculating on the growth of folk biological nomenclature (1972), described a process of "horizontal expansion" within the generic taxonomic rank. He argued that this process of expansion--by "concrete transposition," as he termed it--preceded vertical expansion by differentiation and generalization (producing respectively specific and life form taxa). Unfortunately, Berlin implied that "concrete transposition"--in which new generic taxa are named by "analogy" with an existing generic prototype--is somehow a less highly evolved abstraction than is differentiation or generalization. Berlin's assessment here seems to be ethnocentric, taking contemporary English folk classification--with its predominant reliance on highly generalized life forms--and scientific taxonomy--with its exhaustive "marking" of species names--as the ideal standard by which other classification systems are to be evaluated.

It may be that hierarchic development in folk taxonomies is correlated with general socio-cultural evolutionary trends. It may also be the case that Durkheim and Mauss (1903) were correct in asserting that hierarchic classification follows the development of hierarchic social orders. Certainly the Sahaptin aversion to the subordination of one named taxon to another accords well with their equally strong aversion to the subordination of the will of one individual to that of another, be it chief or government official, a trait widely reported among dispersed hunter-gatherers (Lee 1979:). In any case, there is no good reason to judge a hierarchic biological classification system cognitively more advanced than one organized around prototype fields (Henley and Stratton 1981) In fact, hierarchic systems may be seen as special cases in which the boundaries of fields have been reified. What evolutionary advantage might accrue from such a reification is unclear.

Sahaptin speakers avoid binomial names and use other structure defining names sparingly (in only 18 of over 400 cases). They also tend to reject as names expressions which refer explicitly to properties or functions of

the organisms cited. Consultants may employ expressions such as kʷukʷú 'prickly' (for thistles and other prickly plants) or tawtnúk X 'medicine for X' (for plants used to treat the condition named) but they invariable qualify their response by asserting that the expression is not a true name, that a true name exists, but that they either do not know it or have forgotten it. In short, names appear to be so much a part of the essence of the thing named, that an opaque form is strongly preferred. As with names of persons, the name of a plant or animal embodies a unique and spiritual life force. It thus seems that the prevalence of lexically compound expressions of all kinds, and binomial names in particular--like the growing reliance on life form generalities (cf. Dougherty 1979, Brown 1977, 1979)--indicates both a functional and spiritual distantiation from nature.

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TABLE 1: FEATURES OF PROTOTYPES AND SATELLITES

	BINOMIAL	-waakuł	REDUPLICATION	COVERT SATELLITES	
SIZE[a]	pyuš (-)	c'iiła (-) č'iši (-) saxi suspan (-) tawša	wiwnu šaak tkʷinat apin išt̓xni k'usi	hahaw tamšuy (-)	N=3
RANGE[b]	šaxat miimanu	c'iiła č'iši nank		t'uulnawała (-)	N=4.3
MORPHOLOGY[c]	miimanu watik'asas			waxpuš (-) t'uulnawała (-) xliławit (-)	N=2.3
CULTURAL SIGNIFICANCE[d]	miimanu watik'asas	anipaš nank saxi suspan tmiš	wiwnu tkʷinat apin k'usi	hahaw taštaš (+,-) tišpun waxpuš xliławit	N=10.3
	N=3	N=8	N=6	N=7	N=24

[a] The taxon listed is relative large unless marked (-), in which case the reverse is true.

[b] The taxon listed (prototype in columns 1-3, satellite in column 4) is the most common or widespread, unless marked (-), indicating a rare or peripheral rang

[c] The taxon listed is morphologically or behaviorally more typical of the field, unless marked (-), in which case it is atypical relative to the field.

[d] The taxon listed is more significant culturally relatively to the field, unless marked (+,-), indicating two distinct peaks of cultural significance,

THE EARLIEST CLACKAMAS TEXT[1]

0. The earliest recorded text in Clackamas Chinook was obtained by Franz Boas from someone (unidentified) at Grande Ronde reservation in western Oregon. The year was 1892, according to Sapir's footnote to the first of two 'Supplementary Upper Chinookan Texts', published by him in his volume of Wishram Texts (1909: 232, n. 1). There he states: "This short Wasco text, as well as the Clackamas text that follows it, was collected by Dr. Franz Boas in 1892 at Grande Ronde Reservation in northwestern Oregon, and has been kindly put at my disposal by him."

The year may have been 1890. The Boas diaries and letters published by Rohner (1969) show nothing for 1892, either in the way of records from Boas himself (cf. pp. 132-3) or as to a field trip in that year (p. 311). The materials from 1890 do show Boas visiting Grande Ronde twice in that year, before and after discovering Charles Cultee, who was to be his main source of knowledge about Chinookan, at Bay Center, Washington (Rohner 1969: 118, 121, 123). And 1890 is the year in which Boas collected a Wasco vocabulary (preseved in notebook 2 now in the Library of the American Philosophical Society). I have not been able to check the Wasco text for identification, since both it and the Clackamas text discussed in this paper are missing from notebook 1 in which they were recorded on pp. 32 and 33, presumably having been given to Sapir for publication. But there is also some Clackamas vocabulary (11 pages) from 1890 in notebook 2 as well. These indications of work in both dialects in the summer of 1890 make it almost certain that the following passage from Boas' diary of that summer applies:

"It was of little use to get angry over my lost instruments [on first reaching Grande Ronde], especially since I was able to