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hypothesized because the taxonomy possessed only a few midlevel taxa or categories (cf. Berlin et al. 1968:291) resulting in large undifferentiated groups of specific taxa. To test this hypothesis Berlin et al. had Tzeltal informants perform a number of sorting tests (1968:295-296). These tests revealed a certain amount of subcategorization or subgrouping of plant specific taxa strongly suggesting the existence of covert or unlabeled midlevel categories in a folk taxonomy.

One of the tests employed by them (1968:293) is the *triads test* that "requires informants to specify which item in a set of three [in their application items were Tzeltal plant names written on sheets of paper] is 'most different' from the others." The triads test, which is run for all possible triads in a set of terms, clearly reveals unlabeled subgroupings of Tzeltal botanical categories.

Berlin et al. (1968:296) claim that unlabeled groupings are not "generated in terms of culturally irrelevant oppositions of [their] own invention." I believe that while this may be true of some unlabeled groupings, it is probably not true of most of those revealed through sorting procedures like the triads test. Such tests often present informants with culturally irrelevant options coercing them to sort items together which they rarely, if ever, group together on an *ordinary day to day basis*. Such groupings can hardly be regarded as culturally relevant.

An important aspect of the Berlin et al. argument is that biological entities are assigned to taxonomic categories on the basis of morphological similarities. I do not deny that informants subjected to sorting procedures often group items together on the basis of shared perceptual properties. If asked to sort together on the basis of similarity two of the three symbols "x," "d," and "b," I would choose "d" and "b." I do not, however, ordinarily make this sorting, and the fact that I do so sort them has nothing whatsoever to do with my ordinary perception of things or, for that matter, with named categories of things hierarchically juxtaposed with respect to class inclusion.

Berlin et al. (1968:292) also note that informants' comments on plants in the field were important checks on the cognitive

validity of unlabeled groupings of taxa revealed through sorting tests. These were descriptions of certain plants as "food, herbs, firewood, and so on" (1968:292), and as such refer to "cross-indexing" of plants under categories unrelated to ethnobiological taxonomy proper. Consequently they do not reinforce arguments to the effect that unlabeled groupings are found in botanical taxonomy at intermediate levels. On the other hand, such comments may indicate that many unlabeled groupings are in reality not covert after all, i.e., that their taxa are cross-indexed under some non-biological labeled categories.

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Further Notes on Covert Categories and Folk Taxonomies: A Reply to Brown¹

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In Berlin, Breedlove, and Raven (1973:214-242), we present several hypotheses concerning the nature of folk biological classification and nomenclature. Cecil Brown (1972) questions two of these hypotheses, both of which pertain to the nomenclatural peculiarity for taxa of the

two proposed universal ethnobiological ranks,² the *unique beginner* and the *intermediate*, as generally being unlabeled or "covert."³

Brown suggests that the hypothesis for covert unique beginners in folk taxonomies lacks empirical support. He further argues that most covert, midlevel taxa are spurious, for while informants may be able to group plants (or animals) on the basis of gross morphological similarities, this must not be taken as evidence that the resulting groupings are taxonomically valid. Furthermore, if some of the intermediate groupings have any validity whatsoever, they most likely "... are not covert after all, i.e., ... their taxa are cross-indexed under some non-biological labeled categories."

In this short note, I do not wish to review all of the data now available that might bear on a clarification of Brown's objects. However, I will attempt to present a short summary of our basic argument.

The Unique Beginner as a Covert Category

It will be recalled that the unique beginner is the most inclusive taxon in any particular taxonomy. In English folk botany, this taxon is known by the label *plant*; in English folk zoology, by the label *animal*. In the folk biological taxonomies of many preliterate societies, no such terms have been reported⁴ (Berlin 1972, 1973a, 1973b; Turner 1973; Bulmer 1970; Bulmer and Tyler 1968; Diamond 1966; Wilson 1972; Hays 1974; Brunel in preparation; Anderson 1967). These data lead to two distinct hypotheses concerning folk biological classification. One hypothesis, that apparently adopted by Brown, is that lack of a linguistic designation implies lack of the concept itself. An alternative, more cognitively biased hypothesis—that taken by myself and others—is that while an overt linguistic marker may be an unambiguous indicator of the existence of a category, absence of a label does not necessarily imply absence of a category. If one observes that the unique beginner is named in some languages, but not in others, the empirical question immediately suggested is the following: Are there sufficient data to indicate the *cognitive* recognition of the

category in those languages where it is not named?

I do not know the extent to which Brown has tested his hypothesis: lack of a name implies lack of a category. My colleagues and I have, however, attempted to test our ideas concerning the existence of the covert taxon, *plant*, in Tzeltal, and I have recently made efforts in this direction for the Aguaruna Jívaro, a people of north central Peru (Berlin 1973a, 1973b). While Brown reviews some of our arguments for the Mayan materials, I would like to state them again in a different light.

(1) A rich and extremely diversified vocabulary exists in Tzeltal that can be used to refer *only* to organisms of the plant world. This vocabulary focuses on such characteristics as plant growth and development and, especially, plant morphology.

(2) In sorting tasks, plant names are invariably separated, as a group, from contrasting members of a domain we would interpret as 'animals,' a class which has, for some informants, an habitual label. True, while we have not required native informants to contrast the complete inventory of plant taxa with that of all known animal taxa, the number was sufficiently high to convince us, after numerous years of folk biological research among the Tzeltal, that the two domains do not overlap.

(3) Perhaps the strongest evidence in support of the conceptual recognition of the world of plants by Tzeltal speakers is the obligatory occurrence of all plant names with the plant-classifying numeral classifier, *tehk*. While Brown mentions this formal linguistic characteristic of plant names in his objections, I do not believe he fully understands the classificatory importance of the form.

In Tzeltal, as in many other languages of the Mayan family, a system of nominal classification exists whereby it is impossible to enumerate a particular object, action, or event without at the same time specifying some semantic features of the things being counted. Thus, 'one oak' must be rendered in Tzeltal as 'one [object of the plant class] oak' (*h-tehk hihte*?); the expression 'one man' as 'one [object of the human class] man' (*h-tul winik*), 'one gopher' as 'one [object of the animal class] gopher' (*h-koht*

ba). It could, of course, be argued that such a system of classification has little semantic importance, much like, say, gender in certain of the Indo-European languages. Earlier research into the nature of Tzeltal numeral classifiers, however, (Berlin 1968; cf. Haviland 1970; Rey 1971; Friedrich 1972), reveals that the system is semantically quite productive (more than five hundred forms have been isolated), and suggests that classifiers provide an important index of the Tzeltal's basic classification of the natural world. To argue that the presence of *tehk* with all plant names is merely a "syntactic feature" which lacks "anything to do with taxonomy" is, I believe, grossly inaccurate.

Covert Taxa of Intermediate Rank

In conducting empirical research on folk biosystematics, one is struck by the fact that large numbers of generic taxa are immediately included taxonomically in a particular life form taxon. Focusing only on the named generic taxa in Tzeltal, it can be observed that some 171 appear to be immediately included in the life form *te'* 'tree'. In Aguaruna Jívaro, some 280 generic tree taxa are immediately subsumed in the life form *númi*. As we noted in the 1968 paper, "...if one relies solely on the relationships revealed by the overt taxonomic classification of named taxa, the horizontal ordering of the immediately included [taxa] is necessarily arbitrary" (Berlin, Breedlove, and Raven 1968:292). On the other hand, rather than assume that native informants carry around in their heads some kind of alphabetical listing of the rather large numbers of generic taxa involved, it seemed profitable at the time to investigate the possible existence of covert groupings by which "...smaller subsets of terms within a named contrast set would be conceptually grouped together" (*Ibid.*:292; cf. also the original work on covert categories in Tzeltal by D'Andrade, n.d.). Ethnographic elicitation, exclusively in the form of a simple sorting task, revealed that covert-midlevel taxa were of importance in the Tzeltal classification of the plant world.

Subsequent work by Hunn, on Tzeltal folk zoology (1973a), Hays on Ndumba folk botany (Hays 1973), and myself on

Aguaruna Jívaro folk biology (Berlin 1973a) indicate that covert intermediate taxa are readily isolatable in other domains and languages as well. (The work of Hays deserves special mention in that he has begun serious work on the discovery of covert categories in languages where none of one's informants is literate and, as a consequence, cannot perform traditional sorting tasks required of literate assistants.)

Brown claims that many of the resulting covert categories in the Tzeltal folk botanical research are artificial, due, in part, to one of the eliciting procedures used, the so-called *triads test*. He implies that the triads test was the primary technique utilized to establish the initial groupings, an implication that is false. The triads test was used as one of three means of discovering potentially important contrastive characters by which plant taxa might be distinguished from one another in an already *established* (on the basis of sorting tasks) covert taxon. I agree with Brown, however, that the triads method, if used in a mischievous and insensitive manner, can lead to results that have little if any cognitive significance.

Finally, Brown suggests that some so-called "covert" groupings may be valid, but if they are, they are only spuriously covert in that they are in reality categories that are cross-indexed under some nonbiological labeled categories based, say, on the *function* or *utility* of the taxa involved.

While I am aware that cross-indexing does commonly occur in all languages, I am confident that the covert taxa discovered in Tzeltal are formed exclusively on the basis of the recognition of gross, visually recognized, morphological similarities and do not represent classes formed on functional considerations. To document this fact, I present below a few covert taxa and their included generic forms, along with their basic botanical ranges.⁵

In summary, it should be reiterated that in the cognitively based study of folk biological classification, one major concern is the isolation of recognized groupings of organisms and the specification of their semantic relationships to one another in a culturally revealing way. While it may be the case that most of these groupings will be invariably labeled, we should not be blinded

to the possibility that some may not be. As Kay has so cogently pointed out in his important paper on taxonomy and semantic contrast, "We speak in order to communicate thought; we do not think in order to provide content for our speech" (Kay 1971:874).

Notes

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²In Berlin (1972), Berlin, Breedlove, and Raven (1973, 1974), the botanical term *category* was used in preference to *rank*, a term more common in zoosystematics. In order to avoid possible confusion, it seems preferable at this time to restrict *category* to its usual psychological sense, i.e., an equivalence class of discriminably distinct experiences. I am indebted to Paul Kay for this observation.

³The unique beginner is a proposed folk biological rank comprised of one member, the unique beginner. It is claimed to be the most inclusive taxon in any particular folk biological taxonomy. The folk biological rank intermediate is comprised of taxa that are generally immediately included in one of the major life form taxa (such as *tree*, *vine*, *mammal*) and which immediately include taxa of generic rank (such as *oak*, *virginia creeper*, *bear*). Some covert taxa, however, may be immediately included in the unique beginner, e.g., *cacti*, *mosses*, etc. The term *evergreen* refers to one of the rare intermediate taxa in American English folk botany that receives an habitual label and includes, for most speakers, generic taxa such as *pine*, *spruce*, *fir*, and so on, and is itself directly included in *tree*. Current thinking on the nature of folk taxonomic structure suggests some important developments since Kay's formal explication in 1971. See Hunn (1973b), Randall (1973), and Kay (1973).

⁴This finding has important implications for the growth of folk biological taxonomies which bear, I think, on some issues of the more general problem of lexical evolution (see Berlin 1972; Geoghegan 1973).

⁵For a distinction between basic and extended ranges of plant taxa see Berlin, Breedlove, and Raven (1974:56-58).

	ʔac'am teʔ	<i>Rapanea myricoides</i>
	k'ošoš teʔ	<i>R. juergensenii</i>
[covert]	c'ah k'olol	<i>Myrica cerifera</i>
	teʔ	<i>Garrya laurifolia</i>
'tree	k'anʔoal teʔ	<i>Rhamnus discolor</i> , <i>R. nelsonii</i> , <i>R. caprifolia</i>

[small trees with inconspicuous flowers, small, purple, hard, round fruits, and glossy, lanceolate, to oblanceolate, leathery leaves]

[covert	č'iom hol	<i>Smilax</i>
'ak']		<i>domingensis</i>
'vine'		

čohčoh č'iš *S. bona-nox*

kul ʔak' *S. subpubescens*

ʔihk'uye č'iš *S. jalapensis*

[variously armed vines, alternate leaves, small greenish flowers, globose berries, all of the genus *Smilax*]

[covert category, immediately included in the unique beginner]	noromaš č'iʔin	<i>Xanthosoma violaceum</i>
	šč'oš	<i>Philodendron polytomum</i>
	yišim ʔahaw	<i>Anthurium montanum</i>
	pihc čitam	<i>Xanthosoma robustum</i>

[all broad leafed, rhizomatous plants of the family Araceae]

Note: Photographs of specimens of plants included in each of these covert categories may be found in Figures 7.1-7.7, 9.13-9.16, and 11.34-11.37 in Berlin, Breedlove, and Raven (1974).

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