PACIFIC STUDIES

Vol. 18, No. 4 December 1995

IDENTIFYING GAME SPECIES WITH THE AID OF PICTURES IN PAPUA NEW GUINEA

Harriet Whitehead
Washington, State University

The author spent time among a Papua New Guinea tribal people, the Seltaman, studying their ideas regarding natural species. In the course of this work, she resorted to pictorial field guides to help identify the local avifauna and the local game repertory. This essay takes up the issues raised by using this mode of identification. One is the question whether--as some claim--preliterate peoples' are unable to "see" pictorial representations as Westerners do. The author explains that the sorts of difficulties she encountered in using pictures for species identification with the Seltaman were no different from the difficulties that emerge when unpracticed Westerners attempt to use pictures for identification purposes. These difficulties (which are surmountable) are most pronounced in regard to photographic depiction and are familiar to scientific illustrators. The author also deals with some of the taxonomic oddities that emerge in the course of identification. At the end of the essay, she offers "educated guesses" as to the mammal species familiar to the Seltaman people. It is hoped that this essay, by alerting other New Guinea researchers to avoidable confusions, will encourage them to attempt mammal identification with the use of pictures.

MY INTEREST in the birds and mammals of New Guinea developed in conjunction with research among the Seltaman people, a group of horticulturists-hunters of New Guinea's Central Ranges whom I first visited from 1987 through 1989. I came to realize that the more I knew about the fauna of the region, the more I understood about Seltaman life. Fredrik Barth, who studied the neighboring culturally similar Baktaman some twenty-three years earlier, has observed that the cosmology of the Baktaman-Seltaman region takes nature as its object (Barth 1987:66, 69), and thus any knowledge of the natural surroundings serves to fill out one's understanding of local belief. However, exploring this argument brought me up against an impasse frequently encountered by anthropologists in New Guinea: the diff-

culty of identifying the game mammals and birds. Birds, most of which are creatures of daylight, can be managed with a good pair of binoculars and a field guide (and diligence), but even under the best of conditions the mammals are daunting. Comprising an assortment of mouse-to-racoon-sized marsupials and rodents, most are nocturnal and cryptic in their habits. They spend their days sleeping in high tree holes or well-concealed burrows and their nights hidden in the foliage; one does not casually observe them in the wild. For most anthropologists, the arduousness of bush travel and bivouacking (particularly at night) and the amount of time that would be consumed in amassing a personal collection of local species rule out the mount-your-own-expedition approach, while enlistment of local hunters to bring one the specimens requires instituting a well thought out program at the beginning of one's field stay (if a reasonably extensive collection is to be obtained)[1] and may bring one up against etiquette problems flowing from the very cultural processes that make game species of interest in the first place.

Among the Seltaman, for instance, game consumption involves carefully engineered privacy. Showing a captured animal is tantamount to promising a share of it to the viewer, the viewer's protests notwithstanding. While certain of my Seltaman friends were willing to make this sacrifice for my sake, the idea of having to wake me in the middle of the night for this purpose with the risk of waking neighboring households in the bargain proved too great an inhibition. (I did ask, at one point.) Again, many game items are cooked shortly after capture at distant bush sites, so that often specimens arrive back at the village in already unidentifiable form. One's best bet is to institute the plan of collecting skulls (or at least teeth) after the feast is over (see Dwyer 1990; Morren 1989). But for the Seltaman, the offer of a bone from an animal that was not shared with the recipient would have been as socially embarrassing as showing the animal but not sharing it. And skull collecting entails a ticklish interference with Seltaman feasting habits. Seltaman typically give the heads of small animals to children, who (like adults) break up and partially consume the cooked bones, flipping the too-hard bits into the fire. Whether or not families would have been willing--and would have remembered--to delay a child's gratification in order to separate meat from bone is a matter over which I have my doubts. Had I made the demand as a new arrival and relative stranger, it might have worked, for during this honeymoon time of my fieldwork, the Seltaman were ready for the new and untried. But I did not, because those questions were not then on my mind.

This brings me to the means of identification that I wish to discuss here --the use of pictures and other nonspecimen evidence. It is a fallback strategy, and the identifications produced thereby cannot be accepted as defini-

tive. Nevertheless, for answering a number of types of cultural questions, the results can be quite adequate. In some research I was doing on food taboos, for example, I was able to determine that virtually every creature categorized as food for "women and children only" was either too small or too seldom encountered (or both) to become a reliable element in the meat-sharing practices that are so central to Seltaman adult male sociality. Discussion launched on the basis of pictures was sufficient to bring this trend to light and for me to assess its dimensions.

One distinct advantage in the use of pictures is that an illustrated inventory brings to viewers' attention a wider range of species than hunting efforts are likely to produce during the eighteen to twenty months that the anthropologist is--intermittently--in residence and provides a collection of creatures that can be compared on the spot. Such an inventory makes one aware of which creature names are (probably) alternate terms for the same thing and which names are most often used generically Along these lines, it was a revelation in my own research to discover that the Seltaman designations for two small tree mouse taxa used in a very hush-hush (though common) ritual sacrifice were terms that Seltaman comfortably applied to a number of depicted biological species, a finding that suggests that any uniqueness in detail of these creatures was not so important in their appointment as sacrifices as was the ready availability of their general type. Had I relied for my understanding on a sample of specimens trapped for a particular sacrifice, I could easily have concluded erroneously that only a certain pair of species was acceptable.

To enumerate other advantages to pictorial methods, the availability of the picture book or books attracts curious visitors, thus widening one's sample of opinions, and its standard inventory becomes a sort of benchmark against which to assess the scope of different informants' knowledge. Further, by introducing the book as a source of entertainment during slack moments, one can repeatedly refresh informants' interest in the topic and harvest new stories and explanations.

Naturally, I strove for as much precision as possible in my species identifications, and the information brought forth by pictures could in many cases be supplemented. I was able to see a modest number of mammals (a half-dozen species); and I had available to me some specimen-based identifications from the game lists of distant, culturally and linguistically related neighbors (Flannery 1990; Morren 1986, 1989; Hyndman 1979, 1984). These additional supports helped direct inquiry and narrow options. As I and the Seltaman progressed in our pictorial specification of local taxa, the information value of each new observation in turn progressed in a sort of snowball effect. The list of Seltaman game mammals that resulted from this

cumulative specification process, while it contains many educated guesses, is nonetheless the most comprehensive to emerge from this area of New Guinea.

It is in the interests of justifying this list and of enabling others to employ similar research methods that I wish, in the present essay, to spell out the details of this approach, clarifying its pitfalls and coming to terms with the sorts of controversy that will inevitably surround it. In what follows, I will deal first with the issue of "picture literacy" among the Seltaman, an area of potential controversy; second, with the supplemental information that I was able to bring to bear upon pictorial identifications; and then with the wrinkles of local folk taxonomy that were encountered among the Seltaman and that are often present in other New Guinea cultures. I conclude with the list of tentative game identifications.

Research among the Seltaman

For two years and two months I lived and worked among the Seltaman people, and spent time as well with their near-neighbors the Angkayak. Both are small horticulturist-hunter societies located in the Murray Valley District of the Western Province. Part of a large congeries of Mountain Ok-speaking groups, the Seltaman and their neighbors nowadays rely for meat more on domestic pig and tinned goods than they did in the past. Still, every capable man puts in a few days every month hunting in the traditional style, and every capable woman spends a comparable amount of time frogging, an engagement that may result in the capture of game mammals and (sleeping) birds as well. The topic of natural species always drew interest from the Seltaman, and I found that drawings and photographs of animals and birds, whether the creatures were local or foreign, were always avidly perused and discussed. I had not gone to the Seltaman with any particular intention of figuring out their faunal environment or any hope of being able to do so. However, for my own diversion, I took up bird-watching while there and had on hand Beehler, Pratt, and Zimmerman's guide to the birds of New Guinea (Beehler et al. 1986). The book was an instant hit with the Seltaman, so following the direction of their interests, I found myself trying to set down a record of Seltaman bird identifications. In the end, I had obtained names for over two hundred taxa of bird *(auon).* In time, I was able to confirm as local 113 of these, and I found that in-field identifications (including killed specimens shown to me) usually supported the identifications Seltaman had given of book illustrations.

When I returned home from Papua New Guinea in 1990, I found that Timothy Flannery's *Mammals of New Guinea* had been published. It is a

virtually complete inventory of New Guinea mammals, with most species photographically depicted and many, though not all, depicted against the background of their natural habitat. Finding that the writing I was doing on Seltaman food distribution and eating restrictions required a better identification of the Seltaman game repertory, and encouraged by my work with the bird manual, I returned to the Murray Valley for a two-month visit in 1993 and introduced the Seltaman to Flannery's photographs. My experience with these two books and with assorted magazine pictures and additional illustrations form the basis of what follows.

Seltaman Picture Literacy

One potentially controversial aspect of the pictorial approach is the question of the New Guinea peoples' competence with pictorial representation. I met a visiting ornithologist in Papua New Guinea who dismissed out of hand the possibility that Seltaman could recognize their familiar local bird species from pictures. To work out a taxonomy on the basis of this sort of evidence would be, in his estimation, simply to spin fantasies. Another quite prominent Melanesian ornithologist, Jared Diamond, who makes a practice of collecting local names and lore as he studies the birds of an area, admits to readily dispensing with the use of pictures for identification after he encountered some of the difficulties that I will discuss below. As I have remarked, ornithologists are at greater liberty to abandon the picture method in favor of in-field identifications, and I would certainly expect them to favor the superior method. But the dismissal of pictures is often as not accompanied by the attitude revealed in Diamond's parting shot: "The picture method's failures illustrate the risk of using our own perceptions to devise tests for the perceptions of another people" (Diamond 1991:84).

I would like to suggest that this "our culture versus theirs" polarization oversimplifies the actual perceptual situation and in doing so prematurely forecloses on a potentially useful methodology Reviewing the literature, I find that my own discipline, anthropology, may be in part responsible for this now widespread suspiciousness regarding the ability of non-Westerners to "see" pictures the way we do. Weighing in on the other side of this issue, I propose that while there may be occasional cases of unusual "picture blindness" among nonliterate peoples, the more usual sorts of picture difficulties that the visiting scholar encounters are indistinguishable from picture difficulties that occur in our own culture.

Anthony Forge's observations about the Abelam, that even after twenty years of contact most were not able to make heads or tails of photographs (including photos of each other in village surroundings), has, with miscella-

neous similar observations from certain Africanists (see, for example, Segall et al. 1966), formed the basis for a rather widespread scholarly distrust of any approach that takes as self-evident our (Western) way of seeing the depicted (Forge 1970). If photographs, which are to us the most veridical of all modes of depiction, can appear senseless to those whose eyes are untrained in picture gazing, we are even less inclined to trust identifications based on graphic illustrations, where the element of abstraction is even greater.

I found in the case of the Seltaman that such distrust was misplaced. Identification difficulties were plentiful to be sure. But upon examination, I could not trace these to any "picture blindness" peculiar to the Seltaman Rather, most difficulties were the same ones observable in our own culture among novice bird-watchers, for instance, or in anyone unpracticed in the use of pictures for any identification purposes other than the identification of ethnically familiar humans. Certain other identification problems were attributable to classification usages; these were difficulties for the anthropologist rather than for the Seltaman viewers. I will concentrate here on the seeing.

It became apparent early in my research that Seltaman with good eyesight were, for the most part, competent, even keen, with most available forms of depiction. While all had some prior exposure to Western pictorial representation, preeminently photography, few had the extensive experience that a Western child would have acquired by school age. This being the case, it was more to their visual credit that some individuals could even discern what was depicted in aerial photographs (culled from magazines). Nor did they miss any beats when it came to graphic illustration. Once when we were perusing a magazine ad that featured an enlarged drawing of a foreign banknote, a three-year-old boy picked out the picture of a bird hidden in the engraved margins of the banknote and, tapping it, murmured *auon* (bird). I would not otherwise have noticed it.

In fact, in comparing Seltaman abilities with the two creature books--Beehler et al. (1986), which is graphically illustrated, and Flannery (1990), which is photographic--the graphically illustrated bird manual appeared superior as a tool of identification. Of course, one can hypothesize reasons outside of the contrast between drawn and photographed why this might be the case. It has been suggested that New Guinea birds are easier to recognize because they are more often seen--alive and in daylight, posed (as in a good picture) and turning to present their different facets to the unhurried eye. The game mammals, by contrast, are most often seen dead, when seen in adequate light, and thus in the limp and misshapen posture of the killed. Their natural live posturings take place, for Seltaman eyes, fleetingly, behind foliage or in the depths of a tree hole, usually by moonlight or in the

distorting beam of a flashlight. Although there is merit to this argument, it is rather diminished when we consider the case of hawks, falcons, and kites. These birds are posers as good as any, they are varied in appearance in the Seltaman area, and most are large enough to present detail to the unaided eye. Yet they are the least differentiated of Seltaman birds. Most are lumped under the generic *auon nginaan* (the rough equivalent to our "hawk"). I surmise the reason for this is that hawks are the birds least often seen dead, or perhaps least often seen close enough to shoot; and that the greater individuation of other birds is the result of Seltaman routinely getting at close quarters with them--that is, shooting them and handling their dead bodies, as they do with the game mammals.

As for the contrast between graphic and photographic illustration, my finding of differing ease of use would have been anticipated by scientific illustrators. Roger Tory Peterson, designer and illustrator of the first systematically organized guide to North American birds, speaks of the "boiling down" (simplification and highlighting) process that the field-guide illustrator must execute with each depicted species, a process not as readily effected by the camera, which "does not intellectualize or edit" (cited in Devlin and Naismith 1977:170). Peterson perhaps exaggerates, since in the hands of someone like himself, the camera can attain to diagnostic depiction; yet-, in general his points hold. The difficulties Seltaman experienced with Flannery's book, which I will detail below, seemed largely attributable to camera artifact and the incommensurability of scale between the photographically depicted creatures. I should hasten to point out that Flannery seems to have intended the field-guide dimension of his work to be achieved primarily in his arrays of skulls and teeth at the back of the book, rather than in the photographed whole creatures. (My guess too is that a comprehensive graphic illustration of New Guinea mammals was ruled out by the lack of illustrators adequate to the task. There are five graphic illustrations included as it is.) Even so, the creature photographs did contain certain types of useful detail not normally present in illustrations. I will comment on this later.

Turning to the specifics of the Seltaman reactions to the two books, it appears that, like us, Seltaman oscillate between a global impression of the depicted creature, which launches the identification along a generic track (e.g., "It's a large rat-type"), and a finer pinpointing in terms of specific diagnostic features ("It has long whiskers and a white tail tip; therefore it's a such-and-such"). A graphic illustration intended as a guide to identification typically includes all essential visual details while eliminating the "noise"--strange light angles, ruffled feathers, and so forth--that a camera picks up. Furthermore, in guides, attention is paid to the relative size of different creatures, so that those depicted adjacently on the same plate are (usually)

depicted in accurate proportionate scale. Whatever loss of realism through stylization or poor color reproduction an illustration may suffer does not seem to override its ability to capitalize usefully on the oscillation between global and specific that eventuates in recognition.

Seltaman reactions to Flannery's photographs often indicated that this movement was being upset. A detail suppressed through cropping on shadow would alter the course of an identification. Many, for instance, hesitated or simply guessed the identification of the photograph of the feather-tailed possum (Flannery 1990:136), while responding immediately (with unanimous agreement on the name) to the illustration on page 139 of the same creature. The illustration foregrounds the peculiarities of the tail, which in the photograph is lost in shadow. Several Seltaman switched identifications of the common cuscus when they moved from the photograph on page 116, where the nakedness of the tail is cropped out, to the same expanded photograph on page 123, where a greater length of tail is revealed. In one case, the search for an elusive taxon, noted for its predilection for high tree holes, was concluded--wrongly--when viewers located a tiny creature (the long-tailed pygmy possum) photographed from below so that it appeared loftily out of reach. The very same species, on a following page, photographed face-to-face with the camera, was never identified as this taxon.

The disproportion of scale between photographs, which derailed Jared Diamond's attempts with pictures, frequently proved troublesome in my own work. Despite my frequent warnings to viewers that "the picture is big but the creature is truly small," some Seltaman when faced with an enlarged mouse, for instance, came up with guesses pertaining to much larger creatures. In two instances, Seltaman who moved from the smaller-scale photo of the northern brown bardicoot on page 84 to the larger scale of the same photo on page 87 exclaimed that the first was the smaller of two familiar subtaxa, while the second was the larger! I myself wrongly gauged the size of the pygmy ringtail on pages 156 and 170, and as a result misled some viewers into wild guesses; eventually one informant who was quite certain of her identification told me it was a lot smaller than I was letting people think.

To return to my point about the recognition process, inasmuch as a depiction deprived Seltaman viewers of the diagnostic details on which they rely, their identifications tended to remain global or, in some cases, to fail altogether. By corollary, when a camera artifact distorted some aspect of the overall gestalt of a creature--such as by greatly enlarging a small creature relative to other depicted species--but preserved a range of detail (e.g., the whiskers and white tail tip), Seltaman would often produce a specific but quite wrong identification.

I should add that, although these factors contributed to the general superiority of drawings to photographs, specific drawings could fall flat. In Beehler et al., Seltaman consistently passed over the two illustrations of their familiar New Guinea harpy eagle, and the illustrations of the brush turkeys left them arguing over which of the many depicted ones matched their three named types. Another important qualification, mentioned above, pertains to the "habitat" features that appear with the depicted creature and are themselves often helpful or even diagnostic. Many of Flannery's creatures are photographed against visible vegetation. One creature, the painted ringtail, as depicted on page 167, would often draw a hesitant response until the viewer noticed that it is traveling along a vine, at which point he would instantly call its name. In several other cases, Seltaman could tell me at what general elevation the creature was photographed because of surrounding vegetation. Elevation (of which I was informing them from the text in any case) is diagnostically important. In illustrated manuals such information is usually included in the text, but textual information, especially botanical information, may be compromised in usefulness if the Western interviewer has no means of translating Western terms into those of the local language. In this respect, Flannery's photographs carried with them an unexpected bonus.

Seltaman unfamiliarity with the conventions of book layout was the basis for a final area of confusion that affected use of both books, though the bird guide perhaps more than the mammal book. Sometimes a bird plate would be broken into two sections by a line. Seltaman rightly perceived that there was a meaning to this but often guessed the wrong meaning, for example, "All the ones on top are cold-place (high elevation) birds, and all the ones down below are hot-place (low elevation) birds." Also Seltaman often assumed that things depicted close to one another were related. In thumbing through issues of *Time* magazine, for instance, viewers strove to link together any two individuals depicted in sequence with no intervening photographs ("Here's the president and here's his wife," or "That's her child," and so on). As it happens, in both species books, creatures depicted in close association usually were zoologically closely related, so the Seltaman response was, unwittingly, appropriate. Nevertheless, the books' deliberate clusterings of zoologically related species furthered the Seltaman tendency to liken the propinquous to the point that many overinclusions resulted. Thus, for example, all the unfamiliar cuckoo-shrikes would be lumped with the familiar ones, as the informant would declare the entire plate of cuckoo-shrikes to be "all *buner.*" (These overinclusions were broken down by later, more leisurely analysis.) Conversely, Seltaman were puzzled by those few instances in Beehler et al.

where a female of a sexually dimorphic species is depicted on a separate plate from the male. They consistently failed to link the two together spontaneously.

The Seltaman tendency to relate two things depicted in close proximity could be glossed as a cultural difference between "us" and "them." But even here, the "cultural difference" idea promotes oversimplification rather than aiding analysis. This Seltaman tendency, it could be argued, is based on the Gricean principle of interpretation: two things close together are assumed--in any culture--to be somehow related unless an additional feature of the situation suppresses this implication. For the book-savvy Westerner, any intervening text tends to suppress the implication of relatedness between two photographs, and the reader looks instead to the nearby text to interpret the picture (Grice 1989:ch. 2). Nonliterate Seltaman have not learned to look for relatedness in the adjacent text rather than in the next available picture.[2] Differences of a similar contextual sort are also perceivable in my own obliviousness to the bird engraving in the banknote margin that the three-year-old Seltaman spotted. It is probable that the very young in Western culture too would stand a better chance of noticing the bird, since for them, as for the Seltaman child, the larger-meaning percept "banknote" does not as yet intervene to suppress any curiosity about the details of the engraving. Both of these examples encourage us to try to pinpoint more carefully the locus of differences between discrepant perceptual responses when these responses come from persons of different cultures. Often the difference is highly context-specific rather than widely ramifying, and a resort to sweeping contrasts of the "us/them" sort is thus inappropriate.

In overview, while Seltaman were rather more easily derailed by incommensurable pictorial size scales than are Westerners (and Westerners are not immune to this problem) and while their lack of experience with books and text caused differences in their assumptions about the relatedness of physically associated depictions, by and large their confusions with Flannery's mammal book were of the sort inexperienced Westerners too manifest when attempting to use photographic guides to species identification. These stem from the fact that the camera does not always preserve the particular balance between overall sense impression and diagnostic detail that characterizes the viewer's strategy of recognition. Their lack of photographic sophistication notwithstanding, Seltaman proved remarkably astute with visual guides of either the graphic or the photographic sort. It is perhaps time to dethrone the mystique that a different culture necessarily means a radically different way of seeing.

Other Dimensions of Species Identification

Decisions regarding the identities of Seltaman taxa involved much more than simply the naming of pictures. I asked Seltaman to describe the habits of a bird or animal, to imitate songs, calls, and other noises (they were startlingly good at this), and to characterize a creature's habitat. All these additional bits of information were matched against what I was able to learn from texts, tape recordings (of bird sounds), and in-field observations. Often the picture only set in motion a process that was completed, if it was completed--and many of my identifications are qualified, by the addition of some critical but nondepicted information.

Of the areas of additional information that fed into the identification process, the ones that Seltaman used most often were habitat, habits (especially diet and sleeping arrangements), and characteristic sounds. Secondarily, lengths of things (tail, feet, noses, whole bodies), odors, or peculiarities of a mammal's fur sometimes assisted in final determinations. Perhaps the single feature that repeated itself most often in the pinpointing of both bird and mammal taxa was the characteristic elevation range of the creature. The Seltaman live and do much of their gardening at 900 to 1100 meters. Higher elevations where temperatures are detectably cooler (say, 1300 meters or higher) are spoken of as "cold place" and lower elevations (say 700 meters or lower) as "hot place." "Cold place true" and "hot place true" are used for the greater extremes. Thus, in considering creatures, a Seltaman might say, "This one lives only in cold place true" or "Such-and-such is the only one of this type that you find in cold place and hot place both." Sometimes a combination of looks, elevation, and one additional detail would be sufficient to pin a taxon down. 'When you read to me that this one is cold place and it builds a little nest, then I knew it had to be X," the viewer of a picture might say.

Other than discourse with many Seltaman, the most important sources of additional information came from conversations with biologists James Menzies and Keyt Fisher, both at the University of Papua New Guinea, and from the publications by other researchers in the Mountain Ok area of partial lists of identified taxa from other Mountain Ok-speaking groups. Three researchers have published partial game mammal repertories for related Mountain Ok groups in which they match native taxa to Western species through collection of physical specimens: Timothy Flannery himself collected among the Telefomin and the Miyanmin, and his book contains many of their taxa terms; George Morren collected among the Miyanmin (Morren 1986, 1989), and David Hyndman among the Wopkaimin (Hyndman 1979,

1984). In some instances I have found useful supplemental knowledge (especially regarding game vocabulary) in the works or personal communications of other Mountain Ok anthropologists, in particular Fredrik Barth for the Baktaman, and Dan Jorgensen and Robert Brumbaugh for the Telefomin (Barth 1975; Jorgensen 1981; Brumbaugh 1980). Although there is naming variation from Mountain Ok group to Mountain Ok group and some variation within groups (judging from Seltaman examples), sufficient threads of concordance for mammals emerged to enable me often to narrow down greatly the possible (biological) identity of a Seltaman taxon by reference to the similarity of its Seltaman name with names of identified taxa in other groups. (I would not rely on this strategy in the case of birds, however, since name variation and thus nonconcordance across groups was much more common for birds.)

Again, in the case of mammals, where there are simply fewer species and native taxa than in the case of birds, a process of elimination could be instigated. When one very clear candidate for a name emerged, the name was assigned to it and the other possible candidates for that name were either routed to other names or scrutinized for indistinguishability from the lead candidate. For instance, field observations led me to fair certainty that the striped possum *(Dactylopsila trivirgata)* was present and called *ngarfem,* but Seltaman looking at the book used this name in regard to the related long-fingered triok *(D. palpator),* the great-tailed triok *(D. megalura),* and sometimes in regard to other stripe-faced creatures like the sugar glider *(Petaurus breviceps)* and the feather-tailed possum *(Distoechurus pennatus). P. breviceps* and *D. pennatus,* however, had other features (gliding and a feathered tail) that led Seltaman to other names, leaving only the closely zoologically related Dactylopsilae as belonging to a generic group, *ngarfem.* When Seltaman remarked that "some *ngarfem* have really big tails, and some have this longer finger," the inclusiveness of the term seemed beyond doubt. In the end of this elimination process for the entire list of Seltaman mammal taxa, some of my "leftover names" were tentatively matched with leftover creatures when additional evidence supported the guess; but more commonly, the leftover names emerged as alternates to a more commonly used term.

Seltaman Taxonomy

As identifications began to firm up, characteristics of the taxonomizing process came into view, and these must be taken into account as further attempts at identification proceed. The Seltaman taxonomy does not specifically match Western taxonomy, but this does not mean that the two have no

properties in common. Ralph Bulmer and Michael Tyler's path-breaking work on Kalam (also spelled Karam) folk taxonomies in the Eastern Highlands has established certain points about the correspondence between folk taxa and scientific taxa that are apposite to the Seltaman case. Briefly, Bulmer and Tyler write that Kalam taxa (creature names) refer *in the main* to recognized "natural kinds" logically comparable to and in many cases matching Western zoological species. At points where the Kalam taxa do not refer to such natural kinds, they are still "relatable to named or unnamed natural units which [the Kalam] recognize." For the Kalam, as for a naturalist, a "natural kind" (or, in Bulmer and Tyler's coinage, a "specieme") emerges, from observation and interaction, as a class "of creatures marked off from all other animals by multiple distinctions of appearance, habitat and behavior" (Bulmer and Tyler 1968:373, 349). This being said, the investigator still cannot tell from any lexical characteristic of a folk taxon, or even its position in a taxonomic hierarchy, whether it is one of the many that will match a Western zoological species (or genus) or whether it is one of those exceptions derived through a more complex move.

In considering the specifics of Seltaman bird and mammal taxonomy, I will confine myself to sketching certain saliencies (often found in other New Guinea taxonomies) that are likely to be encountered by the picture investigator. I list these under the headings (1) generics and specifics, (2) the multiplicity of usage, and (3) funny genders, ages, and stages.

Generics and Specifics

Seltaman taxonomy conforms to the generalizations about folk taxonomies made familiar by Berlin, Breedlove, and Raven (1973), and more recently by Atran (1990). Accordingly, despite its awkwardness, I will employ the terminology that these thinkers apply to the different taxonomic levels.

The highest named tier of Seltaman taxonomy is that of the life-form: *auon* comprise all birds and bats;[3] *nuk* comprise all furry wild animals;*feimkon*, all snakes; *ais*, all trees and large bushes; and so forth. Typically each life-form encompasses dozens or, in the case of birds and trees, hundreds of named types. There are, however, aberrant categories that behave like life-forms in not being subordinate to any other life-form, but like lower-level taxa in not encompassing many further distinctions. For Seltaman the forms *kung* (pig), *maan* (dog), and *bia* (cassowary) are aberrant in this way.[4]

The level of the taxonomy at which one encounters the majority of names, which in North American taxonomy would be the level of "maple, oak, pine" or "robin, blue jay, wren," is termed the "generic level" by Berlin et al. (1973:219). At the generic level, the Seltaman taxonomy, like most folk

taxonomies, exhibits mainly (though not exclusively) unanalyzable names--names that do not break down into further meanings. The Seltaman *nuk* (furry game mammal) names *ngarem, sop, kwemnok, deim,* and so forth, and the *auon* (bird) names *durem, fitfitop, saap,* and *karom* are genera names.

"Generic" as Berlin et al. use it does not necessarily mean inclusive (1973:223-224). Hereafter, I will resort to the coinage "generic-inclusive" when speaking of terms at the generic level that encompass named varieties. Typically, however, a great many folk genera have no further named subdivisions. Seltaman *kwemnok* and *ngarem,* for instance, are "terminal taxa." The Seltaman term *auon nginaan* (roughly, "hawk') too encompasses no further named distinctions, even though Seltaman will tell you that there are different kinds of *auon nginaan.* A minority of genera, however, do break down into further named subdivisions, and these subdivisions are termed "specifics." Commonly, specifics are coded with name-modifier combinations that incorporate the immediately superordinate term (the generic)--"scrub oak, post oak, and pin oak," for example. These form an exclusive contrast set; that is, all the elements within the set will be binomials built from the same superordinate term. In the Seltaman case, a common contrast set for furry game animals revolves around the terrestrial-arboreal contrast. For instance, the generic-inclusive name for one giant rat type, *dakhon,* breaks down into *kir dakhon* and *el dakhon,* which translate roughly "down below" *dakhon* and "up above" *dakhon*. The Seltaman *iram,* a generic-inclusive name for little tree mouse, and *takhein,* suspected to be a generic-inclusive name for two antechinus species, also have a *kir* (or *ki*) and *el* distinction.

It is not uncommon for one term of the "species" level contrast set to be simply the "generic" term itself, appearing as it were at both levels (Berlin et al. 1973:224). Thus the Seltaman *el iram* may be contrasted simply with *iram,* rather than *kir iram,* in which case the generic represents "just *iram"* or "any other *iram,*" not specifically "down below *iram.*" In the bird world, an example would be *saap,* a forest floor bird (possibly *Ptilorrhoa leucosticta*) whose alarm call is a brisk "whuit!" and *saap tong tong,* a slightly different forest floor bird that flushes with a sharp snapping couplet, heard by Seltaman as "tong! tong!" (very possibly *P. castanonotus*). The fact that the generic level is not distinct from one of the terminal taxa, *saap,* does not contradict the fact that a type versus subtype distinction is being forged at the specific level. Comparable examples from North American folk taxonomies would be rabbit versus jack rabbit or hawk versus chicken hawk, marsh hawk, and so on.

The taxonomic process of forging species contrast sets by using, for one species, the generic term most applicable to the class of creatures being dis-

tinguished could also be witnessed in spontaneous occurrence among the Seltaman. On a number of occasions, I observed a well-known "terminal" generic term suddenly become an encompassing (generic-inclusive) term when a speaker was faced with the classification challenge of a large book of pictures. Thus, all the depicted ratlike small mammals were glossed by some Seltaman with the term for the village rat, *senokiok,* which customarily applies to one biological species. For some Seltaman, all the cuckoo-shrikes on Beehler et al.'s plate 32 became *buner,* even though only a few cuckoo-shrikes are local; and for some, all carnivorous small mammals became *aboysep,* even though only the New Guinea quoll is widely familiar. The viewer in question would give away his or her conceptual process by then quickly shifting the generic-inclusive down to the specific level when confronted with a good representation of the familiar taxon the name of which he or she had been using. "Ah, here's the real *aboysep.*" Or "This one is *buner* straight, the others are kinds of *buner.*" While these spontaneous "speciations" of a generic term were not culturally uniform or stable--different Seltaman viewers might select different terms to extend--they exhibit momentarily the same taxonomizing practice that produces stable speciations such as *saap* versus *saap tong tong.*

In all of these observed instances, the creature whose name was turned into an encompassing term was one that was quite familiar to the viewer. Any line of similarity between it and the less familiar collection of creatures that the viewer was puzzling over seemed to serve as the grounds for extending the familiar creature's term. Typically, less knowledgeable Seltaman would extend the generic name of a familiar creature to other local creatures that more knowledgeable Seltaman recognized under different generic names. But those more knowledgeable Seltaman, when confronted with a book that covered nonlocal and thus unfamiliar species, would make the same sort of move in regard to these new unfamiliar-but-similar examples. In identifying game with the aid of pictures, one must anticipate this move.

A rather different type of unstable encompassment, one that need not reflect poor familiarity with the creatures, was the idiosyncratic attempts by some individuals to use one generic as a higher-order term, encompassing several other familiar generics. For instance, one woman argued that the term *et* covered several different kinds of burrow-dwelling, mouse-sized creatures that have various particular names like *ibiok, iram,* and *mankun.* A greater number of speakers, however, argued that *et, ibiok, iram,* and *mankun* were just alternate names for the same creature, or alternate generic-inclusives for the same unnamed assortment of creatures (in the fashion of *auon nginaan*). Typical remarks would be, "Oh, *et* and *ibiok* and that lot--

they're all the same." This sometimes meant, "There may well be some distinctions, but I can't tell them apart." Or it could mean, "You can use any of these names for a creature of this type, and I've heard various usages." Some speakers, however, saw these terms as differentiating a number of genera. From one man: "*Et* and *ibiok* are similar, but *ibiok* looks more ratlike. *Mankun* I think is something else."

In other words, the hierarchically inclusive relationship attempted by this woman collapses, in the hands of others, into an alternate-terms relationship, though the alternate terms may be conceived as alternate genera (there are different creatures with different names), as alternate generic-inclusives (there are different unnamed creatures that all may be lumped as *et* or *ibiok*), or as simply "different names" for a single genus. Whatever the argument, individuals will appear to hold their side of it with some conviction but have trouble marshaling any enduring collective agreement. In my opinion, this sort of taxonomic situation reflects diverse efforts on the part of speakers to systematize bits of the "hazy periphery" discussed below. It does not differ in kind from simple disagreement over names. Differing family usages and different individual histories with hunting may enter into an individual's idiosyncratic usage.[5]

The Multiplicity of Usage

Perhaps Mountain Ok-speaking groups will prove excessive in this respect, but one speaker's *ambion* (brush cuckoo) is another's *amdion* and yet another's *sangfongin.* Especially in the world of birds, there are often several names in vogue for the same creature or kind of creature, and it is difficult, in some cases impossible, to distinguish usage variation, which Seltaman recognize, from misidentification, which Seltaman also recognize and which is common. If enough time is available, repeated sorties through the book with various informants will enable one to winnow out those informants with a restricted range of knowledge or an indifference to precision, and this will cut down on some of the confusion. Nonetheless, even an informant of fine and discriminating knowledge may clash with another of equal authority over the correct name for the creature in view.

Some of the disagreement between informants can be chalked up to slight differences in dialect histories between individuals. Historically there has been a slow but constant circulation of personnel between the different dialect groups of the Mountain Ok region, which appears to have given rise, in any one group, to a buildup of alternate names for the same creatures. Some families favor one expression, others a different one, and there is little pressure toward uniformity. But this sort of naming disagreement is usually detectable. Someone will eventually point out, "You can call it either X or Y."

Real disagreement over categorization is evidenced when an informant argues that X (or Y) is ruled out as a name for a particular creature because the name rightly belongs to a different creature. To one hunter, a disputed name may associate with little greenish-yellow birds, while another claims it for small yellow-and-black-marked birds, leaving the little greenish-yellow birds open to a different designation. Not only is there "between-subject" disagreement in certain areas--particularly the area of small birds--there is also "within-subject" disagreement. That is, even knowledgeable informants may prove not averse to changing their opinions a year or even a week later.

It is in regard to this arena of real disagreement that the picture method reveals its worst weakness, especially in regard to the scarce-and-small. I discovered in the case of one or two small dicky birds that an intractable disagreement cleared up when an informant accompanying me for in-field sightings, sightings in which the entire "jizz" of the bird was available (its flight pattern, flocking pattern, behavioral and habitat gestalts, and so on), suddenly rearranged his understanding of what the pictures he had been looking at actually referred to. I feel fairly sure that in-field encounters with some of the more obscure small mouse types in the mammal repertory would bring greater clarity to the disputes here as well. (As it happens, bird disputes outnumbered mammal disputes because there are so many birds in the Seltaman ken and, accordingly, so many more less-well-known birds.)

One is likely to find, even under ideal identification conditions, that any given informant will have a core of certainty in his or her identifications surrounded by a hazier periphery. One will find as well that, within any group of informants, there will be a high degree of concentric overlap between people's "cores." Seltaman informants differed mainly as to how wide their core was in relation to their periphery, with individuals with highly comparable dwelling and foraging histories having the highest degree of concentric overlap. It is, understandably, within the overlapping "peripheries" of people's knowledge that classification disagreements occur. My findings with the Seltaman resonate well with Eleanor Rosch's seminal discussion of the formation of semantic category prototypes (see Rosch 1975; Mervis and Rosch 1981). Her suggestion is that statistically common cooccurrences of attributes (e.g., feathers with flight, sharp teeth with rodent shapes) provide the lines along which "prototypes" form in the mind, and prototypes underlie mental classification. Inasmuch as a creature falls between prototypes or becomes distant from the nearest one, subjects will begin to disagree with each other on its correct classification, hedge their classifications, and also change their minds concerning their classifications.

Illustrating these points within the large taxonomic arena of Seltaman birds again, I found that birds did not have to be commonly seen by the Seltaman to win a place in the "core," as long as they were physically distinc-

tive. Neither the pheasant pigeon *(Otidiphaps nobilis)* nor the various crowned pigeons (species of *Goura)* depicted in close association on Beehler et al.'s plate 15 were common in the Seltaman hunting range. Yet Seltaman viewers had no trouble distinguishing them, despite their close association on the page, and there was widespread agreement over their names. The gouras have the distinctive feathered crown, while the pheasant pigeon has no other ground pigeon of comparable size with which to contrast except the gouras. On the not very distinctive or poorly recognizable end of the scale, by contrast, there was considerable instability in the use of names for certain little mid- or under-story songbirds not infrequently encountered on the local trails, such as the female fairy gerygone *(Gerygone palpebrosa),* the canary flycatcher *(Microeca papuana),* and the white-faced robin *(Tregallasia leucops);* or in names for hard to see as well as hard to distinguish predominantly green fruit doves (species of the *Ptilonopus* genus). For certain sets of unrelated but not terribly distinctive birds, such as little flycatchers and whistlers, two sets might provoke from Seltaman a (probably) chronic vacillation in regard to which of two inclusive terms went with which.

Funny Genders, Ages, and Stages

The taxonomic "wandering" of attributes that relate together or split apart creatural types is the final, and probably least understood, of the issues that students of folk taxonomy encounter, whatever method of identification they use. I have devoted a separate publication to this matter (Whitehead 1994), and will only touch upon highlights here.

Intraspecies variability, developmental stage differences (such as that of caterpillar to butterfly), and sexual dimorphism in a (biological) species all provide opportunities for taxonomic distinctions--as when two or more variants of a species, two or more developmental stages of a species, or the two genders of a species are rendered as two or more separate folk taxa. Conversely, gender and sometimes age (or developmental stage) are notions that may be mapped onto two or more distinct biological species to render them taxonomically unitary. In North American folk biology, for instance, one might call to mind how commonly urban apartment dwellers gloss the smaller of their two species of cockroach as "baby cockroaches" or how, until rather recently, freshwater bass fishermen habitually referred to the largest specimens, which are typically female, in male-gendered terms: "Mr. Lunker" or "Granddaddy Bass."[6]

New Guinea peoples are often specialists at baffling species linkages and disconnections of this sort. Indeed, here is one area of dramatic diversity among New Guinea cultural groups, despite the extensive overlap from

region to region in the faunal and avifaunal repertory (see Dwyer 1976b; Diamond 1966; Bulmer and Menzies 1972-1973). I will confine myself mostly to the Seltaman's strange glossings that center on gender.

Seltaman are quite capable of making the male and female of a dimorphic species into separate taxa or of treating intraspecific variation as gender difference. Or they may treat two distinct species as simply males and females of a single taxon. We must distinguish here between individual Seltaman usage and more culturally standardized usage. One normally knowledgeable informant, grappling with Flannery's pictures, proved as an individual especially fond of explaining differences in terms of gender. He noted the differences between the various long-beaked echidnas photographed by Flannery, differences that naturalists explain in terms of intraspecies polymorphism, and argued that the noticeably more thorny and longer-beaked one on page 44 was the female, while the shorter-beaked, less thorny one on page 43 was male. He also tried to make the speckled dasyure on page 48 and the three-striped dasyure on the facing page into male and female of a single taxon. (The adjacency of the pictures in both cases seems to have encouraged these assimilations.) Other knowledgeable Seltaman did not make comparable moves when faced with the same pictures, but all were possessed of the general idea that the male and female of a taxon might differ in appearance.

Running in the converse direction, Seltaman uniformly would categorize the male of the sexually dimorphic common cuscus *(Phalanger orientalis)* as *deim* and the female as *arik.* Nothing in my first rounds of questioning indicated to me that my informants thought of *deim* and *arik* as related in any fashion. Indeed the enlarged picture of *P. orientalis* drew comments such as, "It's *arik,* but the tail is *deim,* so I'm not sure." It was only after I found no suggested *arik* or *deim* pictures other than that of *P. orientalis* that I remembered that the two sexes of this species are differently named in other Mountain Ok groups and began to probe for a relationship. Cautiously, I asked two informants whether there were any male *arik* or any female *deim.* No, they replied, only female *arik* and male *deim.* A third man informed me, "We have a story, told by the old folks, that *arik* is married to *deim.* She left her cold-place husband, *kayang* (the coppery ringtail, *P. cupreus,* whom she resembles), and came down to hot place to live with *deim.*" This evidence would seem to point to the nonrecognition of the unity of the two taxa. The sexual relationship between them is distanced: it is a "story" the old people tell. It is possible as well that for many Seltaman the fact that there are no females of a taxon or no males is of very little concern; it's just the way things sometimes fall out. Yet when the two men who reported there were no female *deim* and no male *arik* were later pressed with the question "*Arik*

and *deim* are the same *nuk,* aren't they?" they answered laconically, after a moment's reflection, "Well . . . yes." I speculate below that the same taxonomic divorcing of the genders applies to certain bandicoot species as well.

New Guinea provides us with many dramatic instances of sexual dimorphism in birds. Seltaman handle these dimorphisms variously. In the case of moderately dimorphic birds that fledge differently from the nest, such as the Papuan king parrot or certain fruit doves, Seltaman gloss the two sexes as naturalists would.[7] In the case of one radically dimorphic species, the eclectus parrot, in which the sexes are both equally decorative and fledge differently from the nest, Seltaman make the two sexes different taxa and say that they are *mom,* that is, mothers brother and sisters son, to each other. Finally, in the case of those sexually dimorphic species such as many of the *Paradisaea* genus in which juvenile males retain the drab, "female" plumage for one or more years past fledging, not developing their dramatic decorative plumage until later in life, the Seltaman reverse the genders, speaking of the highly plumaged males as the "big sisters" and the drably plumaged birds as the "little brothers." When pressed on this issue, they insist that the "big sister" is a true female and that she is the egg-layer of the pair; and most, though not all, seem to follow the corollary logic that the "little brother" changes gender in becoming a "big sister." Although interpretation of these novel linkages and disconnections is still undeveloped in the literature, investigators in any area should anticipate phenomena of this sort and be prepared to ask the sometimes counter-intuitive questions that are needed to surface the underlying concept fully. If one taxon is said to transform into another, do the two also interbreed or does each instead breed only with its kind? Are some taxa nonreproductive? Do all "X's" change into "Y's" or just some of them? And so on.[8]

Game Taxa of the Seltaman Hunting Range

The range of territory Seltaman exploit can be located in the southeast quadrant of the Telefomin Topographic Map.[9] Both Seltaman villages lie in the valley of the I ("ee") River (labeled Wangop on the map), a tributary of the Murray River (called Wangop by the Seltaman). Seltaman generally put their land boundaries "halfway" to the villages of any neighboring ethnic group, often using a creek judged to be halfway as the marker. Thus their range extends hallway to Selbang in the northwest, to Biangabip in the south, to Bolovip in the west, to Baktaman in the southeast, and to the Kasanmin villages in the north. The Murray River itself forms their eastern boundary. There is not much in this range lower than 600 meters or higher than 2800; most local hunting occurs between about 800 and 1800 meters.

However, Seltaman often visit Biangabip and occasionally Olsobip, and are acquainted with certain more lowland species from such visits. Movement toward Bolovip takes them to elevations as high as 2800 meters, "cold place true."

I have clustered their game taxa in terms of the clarity of meanings of the taxa terms, starting with the more certain cluster.

Fairly Certain Meanings

YAKHAIL: THE LONG-BEAKED ECHIDNA *(ZAGLOSSUS BRUIJNI).* There would be no dispute over the identification of this distinctive creature. The Telefol term is *egil* or *igil,* the Wopkai term *yakeil.*[10]

KITEM: THE SILKY CUSCUS *(PHALANGER SERICEUS).* I have seen this species twice. There was little disagreement among the Seltaman over the picture in Flannery or Flannery's characterizations. One or more *kitam* of the Wopkaimin have been positively identified as *P. sericeus.* The Telefomin have given *kutip* as a name for *P. sericeus* specimens.

SOP: THE PAINTED RINGTAIL *(PSEUDOCHEIRUS FORBESI).* I have twice been shown this species with its distinctively patterned face, and Seltaman agreed on the picture and gave supporting details. Telefomin call *P. forbesi* specimens *sobim;* the Eastern Miyanmin studied by Morren call it *tifon* or *sobim.*

KWEMNOK, KWIAM, KOYAM: THE GROUND CUSCUS *(STRIGOCUSCUS GYMNOTIS).* *Koyam* plays an important role in Mountain Ok mythology and ritual lore. The term is found in most Mountain Ok dialects in application to a large ground-sleeping but tree-climbing grey cuscus that is now, for the Telefomin and Wopkaimin, positively identified as *S. gymnotis.* The Seltaman *kwemnok* fits the portrait of *S. gymnotis* well, and there was little disagreement over the picture.[11] In the Seltaman area, *kwemnok* is the *nuk* taxon most taken by hunting dogs.

KAYANG: THE COPPERY RINGTAIL *(PSEUDOCHEIROPS CUPREUS).* The *kayang* I have seen matched the picture of this species well, and it was captured at an appropriate ("cold place") elevation. Wopkaimin *kaian,* Miyanmin *kiyong,* and Telefomin *kayang* specimens have been physically identified as this species. Less-sophisticated Seltaman often included the plush-coated ringtail *(P. corinnae)* under the name *kayang,* arguing when pressed on the point that there are some *kayang* that are smaller than others *(P. corinnae* is smaller than *P. cupreus).* More-sophisticated Seltaman gloss *P. corinnae* as *dafaam.*

DAFAAM: THE PLUSH-COATED RINGTAIL *(PSEUDOCHEIROPS CORINNAE).* Sometimes spoken of as a "smaller" *kayang* (see above). Seltaman who use

the term *dafaam* point out that it is a cold-place species that sometimes sleeps exposed on a tree branch; this fits the profile of *P. corinnae.* Some Seltaman gave *arukiok* as an alternate name for *dafaam.* The Telefomin call *P. corinnae* specimens *dabam,* the Wopkaimin *dawam.*

NGEREM, NEREM: STEIN'S CUSCUS *(PHALANGER VESTITUS). P. vestitus* is the primary recipient of these names, though it was not uncommon for Seltaman also to pick the picture of the similar *P. orientalis* as a *ngerem.* The Seltaman *ngerem* is the third most commonly caught large *nuk* taxon in the area (following *kwemnok* and *watom,* both of which are highly vulnerable to dogs). The abundance of *ngerem* in the area is also suggested by the fact that the previous inhabitants of the I River Valley, chased out by the Seltaman and the Baktaman, were called Ngeremkaakmin--"masters of *ngerem.*" This abundance raises the suspicion that the Seltaman are glossing more than simply *P. vestitus* with the term *ngerem,* and the likeliest second species is *P. orientalis,* which is more apt to be abundant in any given area than *P. vestitus* (hence its name "common cuscus"). It should be noted that the Wopkaimin at some point gave the term *nareim* for both *P. vestitus* and *P. orientalis* (Hyndman 1979), though later Hyndman narrowed the term to *P. vestitus* (Hyndman 1984).

Yet there is also fairly strong support for the idea that Seltaman culture forges a distinction between these two species, glossing the highly variable and sexually dimorphic *P. orientalis* as *arik* for the female and *deim* for the male. In discussion with Seltaman, *ngerem* is characterized as a middle to higher elevation taxon, and this characterization better fits *P. vestitus.* Meanwhile, the characteristics of *arik* and *deim,* the other two terms offered for the picture of *P. orientalis,* better fit *orientalis* (see next entry). The Telefomin use the name *nelem* for a species confirmed as *P. vestitus.*

ARIK AND *DEIM:* THE FEMALE AND MALE COMMON CUSCUS *(PHALANGER ORIENTALIS).* The picture of *P. orientalis* drew *ngerem, kayang,* and *ngorim* responses in addition to *arik* and *deim;* but it was the only picture drawing *arik* and *deim* responses (often with the informant vacillating between the two names), whereas the other names could persuasively be assigned elsewhere. As explained earlier in the text, it is common for *P. orientalis* males and females to be glossed separately in Mountain Ok cultures, a finding that is in concordance with naturalists' reports of its sexual dimorphism. The Telefomin use the terms *aligaan* and *ibim* for the two sexes, while the Miyanmin use *aligin* (or *ariken*) for the female and *ibim* for the male.[12]

On close questioning, Seltaman proved aware of the paired nature of *arik* and *deim.* Furthermore, they characterize *arik* and *deim* as middle to lower elevation dwellers, in contrast to *ngerem,* and as shorter-bodied. One knowl-

edgeable hunter responded strongly to the information that the depicted *P. orientalis* commonly carries twins, saying that this was the fashion of *arik.* All of these characterizations point in the direction of *arik* and *deim* being names for *P. orientalis,* with *ngerem* being the name for *P. vestitus.* I am quite ready to believe, however, that while Seltaman culture makes available a distinction between these two species, Seltaman people, in practice, may frequently conflate the two. On my first visit, I was shown--on separate occasions by the same hunter--first a creature called *deim* and then a creature called *ngerem*. My on-the-spot descriptions of these would support the opposite conclusion from what I am writing here.

NGORIM, NUK MASEM: THE MOUNTAIN CUSCUS *(PHALANGER CARMELITAE)* AND/OR THE TELEFOMIN CUSCUS *(P. MATANIM).* Both species of phalanger are called *matanim* by the Telefomin. Knowledgeable Seltaman knew that what the Telefomin call *matanim* is their *nuk masem. Ngorim* is the no longer very secret name for *nuk masem* and the one more often used by my informants. *P. carmelitae* alone has been nominated by the Wopkaimin for what they call *norim.*

Flannery does not provide a picture of *P. matanim,* and all Seltaman had trouble deciding the identity of his picture of *P. carmelitae* on page 126. They agree that *ngorim* has a white belly but said that the rest of the fur on the depicted animal "looked wrong." It is conceivable that the main Seltaman *ngorim* is the undepicted *P. matanim* but more likely that it is the more common *P. carmelitae.*

KWIAMFIIK: THE FEATHER-TAILED POSSUM *(DISTOECHURUS PENNATUS).* All using this name responded strongly to the drawing on page 139 depicting the tail. Most commented that the creature has an unpleasant odor. Even women do not eat it, although they would be permitted to do so under the food taboo system. Some Seltaman used the name *kiinfiik* mistakenly for this creature, probably because of the sound similarity of the two names. A possibly geniune alternate name is *babiyomnok.* I can find no counterpart terms in other Mountain Ok game vocabularies.

KIINFIIK, KIINFEIK: THE PYGMY RINGTAIL *(PSEUDOCHEIRUS MAYERI).* After learning that the pygmy ringtail is of a certain size, will sleep in tree forks, and is a cold-place taxon that "makes a little house," Seltaman saw the picture of *P. mayeri* as an acceptable *kiinfiik.* Otherwise they, and I, mistook the picture for something larger than the typical *P. mayeri.*

An Angkayak informant recognized the Telefol term *dom* as designating the taxon she--and Seltaman--call *kiinfiik. Dom* is the term given by Flannery for *P. mayeri.*

SARIP, DIONIM, TABAN: THE SPOTTED CUSCUS *(SPILOCUSCUS MACULATUS)* AND THE BLACK-SPOTTED CUSCUS *(S. RUFONIGER).* Both species were

nominated as *sarip,* with *dionim* and *taban* offered as alternate names. As speculated in note 5, *dionim* may once have distinguished *S. rufoniger* from *S. maculatus,* whereas *taban* may once have singled out the all-rufous adolescent *S. rufoniger.* Another possibility is that the two alternate terms may have discriminated variants within the species *S. maculatus,* which is notorious for its polymorphism. James Menzies argues that the Seltaman are unlikely to be acquainted with *S. rufoniger* at all (pers. com., 1993).

WATOM: The regionally common small dorcopsis (wallaby), very likely *Dorcopsulus vanheurni.* Telefomin call this particular species *autom.*

NGARFEM, NGARFEMNOK, FIOK: Generic-inclusives covering the striped possum *(Dactylopsila trivirgata),* the long-fingered *triok (D. palpator),* and the great-tailed *triok (D. megalura).* One man gave an alternate name, *titok,* for the great-tailed. The three Seltaman whom I questioned about the rarity of the great-tailed had all seen examples, once to three times in their lives. One argued that the larger tail simply indicates a "male" *ngarfem.* I have seen one striped possum.

Interestingly, the Telefomin, in a fashion parallel to the Seltaman, encompass these three species under the term *triok,* while also providing an alternate specific name, *defem,* for the great-tailed. The Wopkaimin gave Hyndman *galwem* for *D. palpator* and *dubem* for *D. trivirgata.*

ABOYIM, ABOYSEP: Any carnivorous *nuk* but preeminently the New Guinea quoll *(Dasyurus albopunctatus).* Other dasyures were classed as *aboysep* when people heard that they were carnivorous. Without this information, the other depicted dasyures tended to be seen as some version of rat or bandicoot. It is possible that there are two local but so far unidentified dasyures that go under the names *el takhein* and *kir takhein* (see below). *Aboim* is the Wopkai term given Hyndman for the New Guinea quoll. *Kutinim* is the Telefol name given to Flannery for the New Guinea quoll; there is no term resembling *aboyim* in his Telefol listings.

AKHEIM, AKHEIMNOK, AREIM, ARIAM: Any water-dwelling *nuk,* with the common water rat *(Hydromys chrysogaster)* and the earless water rat *(Crossomys moncktoni)* being repeatedly singled out for this name. Flannery was given *ayam* for *H. chrysogaster* by both the Telefomin and the Miyanmin. The Telefomin are said to call the earless water rat *ogoyam,* but this may simply be elaborated pronunciation of a word that sounds, in contracted form, like the Seltaman *akheim.*

FAPKOYOK, FAPKIOK: Any glider. The picture picked spontaneously was that of the northern glider *(Petaurus abidi),* but it is unlikely that this one is local. The only other--and likeliest--candidate, the sugar glider *(P. breviceps),* was usually misidentified as a striped possum until Seltaman were told it glides. On closer questioning, one knowledgeable Seltaman claimed that

their glider does not have a striped face. The sound reported for *fapkoyok* is a noisy squawk. The term *fapkoyok* has no clear correspondence to other published Mountain Ok game vocabulary. The Telefomin call *P. breviceps* by the term *silek*, the Wopkaimin call it *slakim*.

ET, KOMEI: Any small tree mouse, melomys, pogonomys, or pogonomelomys that nests in ground burrows, especially around gardens. Among those nominated by Seltaman, the likeliest local candidates are the chestnut tree mouse *(Pogonomys macrourus)*, the grey-bellied tree mouse *(P. sylvestris)*, the large tree mouse *(P. loriae)*, the mountain melomys *(Melomys rubex)*, and Ruemmler's pogonomelomys *("Pogonomelomys" ruemmleri)*. The picture of the lesser tree mouse *(Chiruromys vates)* drew a strong *et* response, but Flannery does not report it as living in burrows. Among Seltaman the term et is the more commonly used, *komei* being recognized as a borrowing from the neighboring Angkayak. I could find no counterpart to either term in other Mountain Ok game vocabularies.

DUBOL: DORIA'S TREE KANGAROO *(DENDROLAGUS DORIANUS)*. The somewhat more common and familiar of the Seltaman's two tree kangaroo taxa. The Telefomin one is positively identified by Flannery as Doria's. A pet Doria's in the town of Tabubil was singled out as *dubol* by Seltaman. There is a *dubol* in most Mountain Ok game vocabularies.

AKHUNIOK, AKHUNI, A'UNI: It became apparent after a number of sorties through the photographs that Seltaman will nominate as *akhuniok* any tree kangaroo not identifiable as *dubol*. In fact no tree kangaroo is common any longer in the Seltaman hunting range, and their lack of familiarity shows in Seltaman attempts to classify pictures. Fortunately, there are tree kangaroos kept as pets in Tabubil, the mining town that Seltaman often visit and where some of them work. The two available species of pets were Doria's *(Dendrolagus dorianus)*, which they identified as *dubol;* and Goodfellow's *(D. goodfellowi)*, which they identified as *akhuniok*. One young hunter, who had killed three *akhuniok* near Biangabip in the past three years, was an enthusiastic nominator of the pet Goodfellows as *akhuniok*. The presence of Goodfellow's in or even near the Seltaman hunting range has not been confirmed, but it is not ruled out.[13]

This does not quite settle the matter, however. Seltaman lore about *akhuniok* is suggestive of another candidate: *D. spadix*, the lowland tree kangaroo. This species is depicted inadequately in Flannery (a top view, page 102), because only a dead specimen was available. Seltaman speak of *akhuniok* as more long-bodied than *dubol* and as a "hot place" (low elevation) taxon. Indeed, most of the Biangabip area, site of the three recent kills, is below 600 meters. Both the long body and low elevation attributes fit Flannery's characterization of *D. spadix* and fail to fit the characterization of

D. goodfellowi. Though rare, *D. spadix* is reported for the Strickland River area (Flannery 1990:103), placing it close to the Seltaman and Biangabip hunting ranges. Menzies is of the opinion that it could be familiar to Seltaman (pers. com., 1993). Further lore about *akhuniok,* which I mention for what it may be worth, is that the creature is extremely fast and virtually impossible to catch without a dog; that it will feint to jump, throwing off the hunter's aim; and finally that its hind feet resemble the feet of a human child.

I can find no counterpart terms to *akhuniok* in other Mountain Ok game vocabularies. The Telefomin and the Miyanmin call *D. goodfellowi* by the term *timboyok,* with an alternate Miyan name being *yemma.*[14]

SENOKIOK, SENOK: The village- and garden-invading rat of the area. Seltaman will often correct their term *senok* to *senokiok* (a diminutive) to emphasize that they are speaking of this rat rather than the bandicoot *nuk senok* (below). They will also use *senok* very loosely in application to any hard-to-place kind of rat or bandicoot. This does not mean, however,. that any of these terms are true generic-inclusives.

The dozens of *senokiok,* or village rats, I have seen appeared of a single kind and most closely resembled the depicted large spiny *(Rattus praetor)* except for being smaller. Quite possibly I was seeing the small spiny rat *(R. steini).*[15] *R. steini* is reported for the Telefomin and the Miyanmin. where it is called *senok.*[16]

Complex Uncertain Meanings: The Bandicoots

Seltaman distinguish four generic taxa of bandicoot, one of which, *bakhonkaak* or *kayaar,* has three kinds that may be glossed differently or simply lumped as *bakhonkaak/kayaar*.

To begin with the smallest of their taxa, *waar* is described as a very high elevation dweller. For *waar,* Seltaman either found no picture or favored the picture on page 68 of the striped bandicoot *(Microperoryctes longicauda)* in which the facial stripe is quite noticeable.

The next size up is *nuk senok,* described as being like *waar* and living at high elevations but less extreme ones than *waar* For *nuk senok,* Seltaman favored either the picture of the striped bandicoot on page 76 or the picture of the Raffray's bandicoot *(Peroryctes raffrayana)* showing a white belly on page 70. *Nuk senok* is most commonly taken by discovering its short ground-vegetation burrow, then poising one hand over one entrance while making a disturbance at the other: the creature flees into the waiting hand.

The third bandicoot, called *kimisok* or *dein,* competes with *nuk senok* for the *P. raffrayana* picture, and its characterization is closer to *P. raffrayana*

That is, it is a heavier, middle elevation species. Seltaman usually picked the picture of *P. raffrayana* held by a boy on page 68. I have seen one *kimisok* and would choose this picture myself. The long-nosed echymipera *(Echymipera rufescens)* on page 83 was also denominated as *kimisok,* but it is unlikely to be local.

The various *bakhonkaak* are described as more short-tailed than the other bandicoots and as middle to lower elevation dwellers. Seltaman favored pictures of the northern brown bandicoot *(Isoodon macrourus),* which is almost certainly not local; the spiny *(Echymipera kalubu);* and the dimorphic *(E. clara).* The spiny, *E. kalubu,* is very likely to be one of the Seltaman *bakhonkaak,* but neither Menzies nor Flannery encourages me to include the dimorphic, *E. clara,* as a candidate. Seltaman characterizations of the different *bakhonkaak,* however, leave a tempting slot for *E. clara.* They say that the largest *bakhonkaak* type, called *wok ngerewaak,* is "always a male" and is generally caught only at middle elevations far from the village. I can find no good candidates for this taxon other than the male of *E. clara,* about which Flannery writes, "The males and females of *E. clara* differ so greatly in appearance that they could easily be mistaken as a distinct species" (1990:82).[17]

Summing up, my guesses are as follows:

WAAR, WAARIIM: MICROPERORYCTES LONGICAUDA VAR. This is a smaller and higher elevation variety of the striped bandicoot, *M. longicauda dorsalis.* (Higher elevation specimens of many New Guinea species are smaller.)

NUK SENOK: A somewhat larger on average and less high elevation variety of this same species. A Wopkai term for this species is *sanok;* a Telefol term is *warem* (note the resemblance to *waar, waariim*).

KIMISOK, DEIN: RAFFRAY'S BANDICOOT *(PERORYCTES RAFFRAYANA).* It is possible that the small females of this species are sometimes glossed as *bakhonkaak* or as *nuk senok.* A Miyan term is *duwin;* a Telefol term is *ibin.*

WOK NGEREWAAK: A large male *Echymipera* type. The Angkayak variant is *wok gerewaal;* I know of no counterpart terms in other dialects. While in Seltaman dialect wok means "water," Seltaman assured me it does not have this meaning in the creature name *wok ngerewaak.* It is possible that wok is a corruption of *nuk* here. Note that the Miyanmin recognize *E. clara* under the name *no kiyok;* the sound of this name could be elaborated into wok *ngerewaak* (Morren 1989:124).

BAKHONKAAK, KAYAAR: ECHYMIPERA KALUBU, probably of both sexes. If *E. clara* is present, the females would probably be classed as *bakhonkaak.* Very small *bakhonkaak* may be called *bakhonkaak senok* but are distinguished from true *nuk senok* by a shorter tail. Another term for the small ones is *man am.* Flannery was given *aiyal* as both the Telefol and Miyan

terms for *E. kalubu* and the Miyan term for *E. rufescens.* The Miyanmin gave *kiyok* for *E. clara.* Hyndman was given *kaial* for *E. kalubu.*

Complex Uncertain Meanings: The Giant Ruts

The zoological portrait of the giant rat species isn't all that clear, and neither is that of the Seltaman. They possess seven terms, but these overlapped in use and two or three appear to be alternate inclusive terms. One reason for vagueness is the lack of "hands on" experience among Seltaman hunters. Two of the terms used inclusively, *mein* and *dakhon,* apply to seldom-caught creatures. Six proficient hunters, upon questioning, reported zero to two captures of these types per lifetime. The taxa called *somin* and *wares* were somewhat more frequently caught. Only *kuter* appeared to be commonly taken, but since the term *kuter* was readily applied to any brown giant rat type known to specialize in eating pandanus, it may encompass several species.

Despite lack of direct experience, the Seltaman seem to be in possession of a transmitted lore in which certain distinctions are embedded. Sufficient bandying about of giant rat 'terms brought some of these distinctions to mind. The term *mein,* for instance, while often used inclusively--or just loosely--was also used more specifically to refer to a deep-bush, arboreal, large, and often black rat that is adept at crossing from tree to tree. The portrait matches quite well that of the dusky black-eared giant rat *(Mallomys rothschildi).* One hunter captured a *mein* during my second visit, though I failed to get a look at it. He described it as black with a white band around it, like the *M. rothschildi* depicted on page 213, but he favored the picture of the grey black-eared *(M. aroensis)* on page 210. Although the depicted *M. aroensis* was not as black as his specimen, it looked closer to the right size (that is, bigger). It was found up a tree.

A linkage between *M. rothschildi* and *M. aroensis* is also suggested by Seltaman use of the inclusive *dakhon. Dakhon* breaks down into two taxa: *el dakhon* ("high *dakhon"*), an arboreal giant rat, and *ki dakhon* (or *kir dakhon*), a very similar terrestrial cousin. Both are deep-bush, "cold place" dwellers. Again, the best candidate for the arboreal one is *M. rothschildi,* and the pairing of this with a very similar terrestrial dweller makes an intriguing match with the habitat contrast between *M. rothschildi* and *M. aroensis* (the grey black-eared), which, according to Flannery, are often sympatric and often confused by naturalists (1990:210-214).[18]

My tentative giant rat guesses are these:

MEIN OR *EL DAKHON:* THE DUSKY BLACK-EARED GIANT RAT *(MALLOMYS ROTHSCHILDI).* One man offered *ngatip* as an alternate name for the

brown version of *M. rothschildi,* shown on page 212. This is similar to the giant rat term *ditip* that the Telefomin apply to *Uromys caudimaculatus,* also brown. Telefomin call *M. rothschildi* by the term *resen.* The Wopkaimin call it *frim.*

KI DAKHON: THE GREY BLACK-EARED GIANT RAT *(MALLOWS AROENSIS).*

FARENKI, FARENKIOK: An alternate generic-inclusive for the *mein* and *dakhon* class of giant rat.

KUTER: Any midsize brown, sharp-toothed rat that specializes in eating pandanus (nut or oil pandanus). *Kuter* are found at all elevations, according to the Seltaman. Both the black-tailed giant rat *(Uromys anak),* which the Telefomin call *kutel,* and the uneven-toothed rat *(Anisomys imitator)* drew *kuter* responses. The undepicted mottle-tailed giant rat *(Uromys caudimaculatus),* which the Miyanmin call *quaterip,* also fits the *kuter* portrait. One hunter interviewed after recently taking a *kuter* favored the picture of the rock-dwelling rat *(Xenuromys barbatus).* The latter is probably not local but is said to resemble the undepicted *U. caudimaculatus.*

WARES: Described as on the small side for a giant rat, brown with a white tail end. It dwells at somewhat higher elevations and stays on the ground. It is not known to specialize in pandanus, though it may eat it. A likely candidate is the white-eared giant rat *(Hyomys goliath).* The picture drew some wares responses. The Telefol term for *H. goliath* is *trossin.*[19]

SOMIN, SOM: The mystery rat of the area. This is the only giant rat that is a regular and virulent garden invader, according to the Seltaman, and the only other *nuk* besides the village rat, *senokiok,* that is an enthusiastic consumer of raw native taro. *Somin* is a "cold place" taxon. It is described as being large and terrestrial. The only picture in Flannery that consistently drew *somin* responses, and strong ones at that, is the picture of the young black and white *M. rothschildi* on page 212. This picture would be greeted by remarks like "Ha! *Somin!*" But, except for being a higher elevation species, *M. rothschildi* fails in every other way to fit the portrait of *somin.*

Simple Uncertain Meanings: Miscellaneous

SUMOLIIM: All agreed that this name applies to a particularly large kind of *watom* (wallaby type). Informants disagreed over whether there are any *sumoliim* in Seltaman territory, most thinking not and arguing that it is found mainly "around Telefomin." Many chose pictures of the dusky pademelon *(Thylogale brunii)* or the grey dorcopsis *(Dorcopsis luctuosa)* as candidates. Either is a possibility, according to Fisher and Menzies. Flannery reports that *T. brunii* is called *simulim* by the Telefomin and *sumul* by the

Miyanmin. Hyndman also found familiarity with *T. brunii* among the Wopkaimin but was given the name *watom.*

BANEPSA, ARUKIOK, MASEM: If we work by elimination, this is probably the lowland ringtail *(Pseudocheirus canescens).* It is characterized as a ringtail type similar in size to *sop, P. forbesi,* but dwelling at lower elevations. For the most part Seltaman could not find a good *banepsa* in the book, though the picture of *P. canescens* was deemed possible. Three hunters preferred the name *arukiok* for this picture but then deferred to the opinion of a fourth who said that *arukiok* is the male, while *banepsa* is the female. One notes the parallel here to *arik* and *deim.* One is reminded too that some Seltaman considered *arukiok* to be the alternate name for the similar-appearing pseudocheirid *dafaam,* or *P. corinnae.*

The Seltaman who suggested the alternate name *masem* stressed that he was not confusing this taxon with the more familiar *nuk masem (Phalanger matanim* or *P. carmelitae).*

MITUUM FASIIN, KAIPMITMITOK, BILBILIOK, FUN-FUN: All agreed these names denote a creature that lives near water, and most felt that they are alternates for a single creature. If so, the waterside rat *(Parahydromys asper),* with its peculiar heavy muzzle, is an excellent candidate. Many singled out the picture of *P. asper* for *mituum fasiin,* which means "swollen nose"; *kaipmitmitok* is a play on the word for "nose." I did not sense that Seltaman had any great familiarity with this taxon, however, and many used the name *bilbiliok* as a generic-inclusive for any water-associated *nuk.* It should be noted that Hyndman has identified a Wopkaimin *bibilok* as *P. asper:*

IBIOK: Like *et/komei, ibiok* is a melomys or pogonomys (small tree rodent) type. Some Seltaman consider *ibiok* simply an alternate name for the et class of creature, but others insist it is not an *et,* merely similar. Pictures chosen for *ibiok* (even by those who swore by its distinctiveness) overlapped heavily with those chosen for *et.* They were large tree mouse *(Pogonomys loriae),* long-footed tree mouse *(Lorentzimys nouhuysi),* mountain melomys *(Melomys rubex),* and chestnut tree mouse *(Pogonomys macrourus).* Because of its commonness in the Central Ranges, the black-tailed melomys *(M. rufescens)* should probably be listed as an *ibiok* candidate, though oddly I got no responses to its picture or text.

IRAM, EL IRAM, NUK EM, BRUSEK: Because this variously named small tree rodent is an important and highly secret sacrifice in cult ritual, we struggled to find a good candidate in the book. It was determined that there are two or more kinds of *iram,* just as there are different kinds of *et.* All are distinguished from *et* by being true bush creatures, not likely to be found in and around disturbed areas. Of the various *iram,* one type (or one type in

the Seltaman view) habitually nests in high tree holes and is called *el iram* ("high *iram*"). This is the one sought for ritual (it is never sought for human food). Women seldom see this kind, and when they do, they call it simply *nuk em* ("sacred *nuk*"). Men know where to find them (having memorized likely tree holes) and refer to them by the secret name *brusek.* Perversely, I never thought to ask that one be found for me.

A number of male informants went for the picture of the long-tailed pygmy possum *(Cercartetus caudatus)* on page 140, because it is seen perched aloft. But a picture of the same species viewed face-to-face on page 142 never elicited this response, and the text on *C. caudatus* does not fit *el iram.* The other candidates, selected spontaneously from the pictures, were all candidates for *et* or *ibiok* as well. These were chestnut tree mouse *(Pogonomys macrourus),*[20] large tree mouse *(P. loriae),* and lesser tree mouse *(Chiruromys vates).* Menzies points out that, of these, *Chiruromys vates* seems to be the one most associated with tree holes (pers. com., 1993).

ABEROK: The long-tailed pygmy possum *(Cercartetus caudatus)* may be a better candidate for the elusive taxon *aberok,* a small creature whose distinctive trait for the Seltaman is its penchant for sleeping in the holes of desiccated tree ferns *(aber).* Only one man, an Angkayak, nominated any picture as *aberok,* and this was the picture of *C. caudatus* on page 140.

Is *C. caudatus* associated with tree ferns? Flannery cites Peter Dwyer as having taken most of the eighty specimens found on Mount Elimbari from nests in *pitpit* (an edible grass) or beneath the fronds of pandanus (Flannery 1990:142), but elsewhere Dwyer himself reports that in the Etolo region of the Papuan Plateau, *C. caudatus* seemed to spend their days nesting in old tree fern trunks, and that is where the Etolo looked for them (Dwyer 1990: 101). Bulmer and Menzies also report the Kalam pulling *C. caudatus* from tree fern holes (1972-1973, part 2:92).

KUKHUN: This taxon is described as a "mainly hot place" small marsupial with large protruding ears and a tail rather like a rat. It sleeps in "tree houses" and eats fruit. It may enter a bush house, but never a village house, at night looking for food. The only likely picture, or characterization, in Flannery is the short-furred dasyure *(Murexia longicaudata),* but Seltaman deny that *kukhun* is a predator.

TAKHEIN: El takhein and *kir takhein* are described as two similar smallish creatures, not of the tree rodent type. Both are high elevation dwellers. One is smaller and is found up in trees *(el takhein),* while the larger one *(kir takhein,)* "stays on the ground." Pictures favored were those of the black-tailed antechinus *(Antechinus melanurus)* and the three-striped dasyure *(Myoictis melas),* which is called *tangtangibo* by Morren's Miyamnin informants. Possible other candidates are the undepicted antechini *A. wilhel-*

mina and *A. naso.* The speckled dasyure *(Neophascogale lorentzii),* called *tning* by the Telefomin and *takinok* by the Wopkaimin, might be considered another candidate because of name similarity to *takhein.*

UBIL, UBAAR, UWAAR: Any small tree rodent or melomys that makes nests in the fronds of pandanus. Candidates are Shaw Mayer's pogonomelomys *(Pogonomelomys mayeri)* and the white-bellied melomys *(Melomys leucogaster).* James Menzies argues against the presence of the latter (pers. com., 1993). Similar Mountain Ok names from other groups are the Wopkaimin *abilim,* identified as *Melomys rubex;* and the Miyanmin *abul,* identified by Morren as *M. rufescens.* (In Telefol, many species of the pogonomelomys are called *kalung.* There is no Seltaman counterpart to this name.)

Angkayak informants tell me *markiik* is their alternate name for *ubil.*

BAMNAIN: This name was offered by one Seltaman man and one Angkayak woman for the black-tailed antechinus *(Antechinus melanurus).*

BATUKIN, KIMIN KAROM: Names for hydromines. *Batukin* was the name offered by one Seltaman man for the short-haired hydromine *(Paraleptomys wilhelmina)* and by another for the long-footed hydromine *(Leptomys elegans); kimin karom* was offered by a third man for *L. elegans.*

MANKUN: Seltaman knew-this name but never spontaneously applied it to anything. The name belongs to a melomys/pogonomys type.

Simple Uncertain Meanings: Bats

I include bat species here because of Western classification rather than Seltaman: the Seltaman classify bats as birds because they fly. They are aware of their distinctiveness vis-à-vis other birds, however, explaining, "*Pisin tru* ["real birds"] have a kind of wing with bones and feathers, but [bats] have something like an umbrella."

YOM, YOMNOK: Yom is any large flying fox or fruit bat that roosts in trees and has some yellow chest or neck fur. The depicted variable flying fox *(Pteropus hypomelanus)* was considered a good example. Another candidate is the greater flying fox *(P. neohibernicus). Yom* do not live in Seltaman territory but only in "hot place true."

SINGAAM: Any dark midsize cave- or rock-roosting bat or flying fox. *Singaam* are found at all elevations. The depicted Bulmer's fruit bat *(Aproteles bulmerae),* called *sikkam* by the Wopkaimin, was considered a good exemplar of the type, though this species is unlikely to be familiar to the Seltaman. The main candidate for the local *singaam* would be the bare-backed fruit bat *(Dobsonia moluccensis),* which the Telefomin call *segam.*

DIRIL: Most tiny bats, other than the more distinctive *tirimin* below. *Diril* are associated with cave or stone roosts but may also be found suspended

under foliage during the daytime. The picture of the moss forest blossom bat *(Syconycteris hobbit)* was considered a good picture example. Other candidates are the western horseshoe bat *(Rhinolophus arcuatus)* and the Telefomin horseshoe bat *(Hipposideros corynophyllus),* which lives in small groups and is exclusively cave-dwelling.

TIRIMIN, TRIIMNOK, TIMINIM, TIIMNOK: An even smaller bat than *diril.* It comes at night to drink banana nectar, emitting a high-pitched "tiii-tiii-tiii" as it does so. (I heard these frequently in the banana trees next to my house.) A good candidate is the common blossom bat *(Syconycteris australis),* called *timinim* by the Telefomin and the Miyanmin. It occurs from sea level to 2000 meters. Another candidate is the diadem horseshoe bat *(Hipposideros diadema),* called *tibinim* by the Miyanmin.

Summary

Ideally, the investigator interested in a New Guinea people's interaction with and understanding of their wildlife would command a wide physical sampling of local species, accompanied by a wide canvassing of local opinion as to name, traits, and position in the environment. But the typical anthropologist will not have such a command or anything close to it. The next best and certainly more feasible approach, now that both an extensive mammal guide as well as a complete bird guide are available, is an initial wide canvassing of opinion through the use of pictures. The usefulness of this technique for exploring the indigenous taxonomy alone makes it worthwhile; and once the investigator attains some mastery of the indigenous taxonomy, any nailing down of a local species through physical evidence becomes that much more informative. Thus, when any physical sampling is available or becomes feasible, even if it is rather spotty and even if it comes from neighboring areas, it sends ripples of clarification through a system that is already partway toward coherence. By vectoring back and forth between available physical evidence and named pictures, the anthropologist can educate his or her guesses as to the presence of any given species, achieving virtual certainty for some, while at the same time learning for each taxon term and its attendant rules and beliefs the type of creature that is at issue.

NOTES

I wish to thank the following people for their help and guidance in bringing this work to completion: Keyt Fisher, Timothy Flannery, Susan Gelman, Philip Guddemi, Bruce Mannheim, James Menzies, and George Morren. My first period of research among the Seltaman was carried out under a National Science Foundation postdoctoral research grant, my second period of research under a grant from the National Geographic Society.

1. In regard to the adequacy of hunting samples, it should be noted that Ralph Bulmer and James Menzies, working on the small-mammal repertory of the Kalam people of the upper Simbai and Kaironk valleys, found that Kalam hunters produced only a selective sample of the small mammals present in their hunting range. The researchers' own trapping methods, in turn, provided a different but also highly selective sample. Finally, examination of sooty owl pellets revealed yet another selective sample. Only in the concatenation of all three samples did Bulmer and Menzies feel they had obtained a representative view. Their work still stands as the model for this kind of research. But this model far exceeds what most anthropologists are equipped to undertake (Bulmer and Menzies 1972-1973; see also Bulmer and Tyler 1968).

2. I am indebted to Bruce Mannheim for bringing Grice's essay on "implicature" to my attention.

3. Seltaman explain that bats and birds are both *auon* because they fly, but are quite aware that there is a difference. They consider the ones with feathered wings more representative of *auon,* as evidenced by their resort to expressions like *singaam auon,* "a [bat-type] kind of *auon,"* when explaining where bat-types fit in the life-form system. When challenged on the point that gliders are classed as *nuk* rather than *auon,* even though gliders appear to fly, they retort, "Gliders don't fly, they jump!"

4. The Seltaman term *auonuk auonauk* (literally, "bird-mother") for the nonlocal lowland cassowary suggests it could affiliate to the *auon* or, through folk etymology, even the *nuk* life-form. And in fact there is a tug in the direction of the *auon* life-form. One in-married Angkayak woman argued that cassowaries are indeed *auon,* and she reported an old-folks tale to the effect that the cassowary once was able to fly up into trees. But other informants tended to sputter when asked, "What kind of thing *is auonuk*?" One said, "It's a kind of *maruk,*" using the Neo-Melanesian Pidgin for "cassowary." Another said, "It's a kind of *bia* [the mountain cassowary]."

5. These naming variations might provide clues to historical change in people's relationship to game species. It seems possible in some cases that alternate names for a single creature, traceable to different Mountain Ok dialects present within a community, may over time become distinct names for two distinguishable creatures. The man above who thinks that "*mankun* is something else" shows himself ready to apply this term to some creature distinguishable from what he calls either *et* or *ibiok.* Conversely, distinct names for distinct but similar creatures may, over time, become simply alternate names for the more familiar of the two or alternate names for what is thought of as a collection of subvarieties.

It is possible that the latter sort of drift, that is, a loss of prior distinctions, has affected Seltaman terms for the spotted cuscus *(Spilocuscus maculatus)* and the black-spotted cuscus *(S. rufoniger),* which naturalists distinguish. Present-day Seltaman, examining pictures, call both *sarip,* adding that one can call them *taban* or *dionim* as well. *S. rufoniger,* which is a deep-bush species rarely found close to human populations, is probably almost never encountered by present-day Seltaman, while *S. maculatus* is encountered mainly at the peripheries of the Seltaman hunting range. Why the wealth of generics for these two? I was intrigued that one older Seltaman man, whose habit has long been to spend about half of each year at remote, lower-elevation gardens, argued that the term *dionim* should

be applied only to those types caught at this remote location, while *taban* applies to the entirely rufous kind. Could it be that this man encountered *S. rufoniger* more often than other contemporary Seltaman and was using *dionim* to distinguish *S. rufoniger* from *S. maculatus (sarip),* while using *taban* to single out the all-rufous adolescent phase of *S. rufoniger?* Although it is impossible to know, note that in Fredrik Barth's report on the Baktaman, who share a common terminology with the Seltaman but who were studied twenty-three years earlier, *dionim* and *taban* are also distinguished from *sarip* (Barth 1975:182).

6. I am indebted to Susan Gelman for the cockroach example.

7. The plates in Beehler et al. indicate the gender of depicted birds with the male and female biological symbols, but Seltaman were unfamiliar with these, and I never explained them to my viewers.

8. One Seltaman informant who was highly knowledgeable about birds in general recognized that, in the case of birds of paradise, there were both male and female "little brothers," According to him, only the female "little brothers" will grow into "big sisters." I failed to inquire whether the untransformed females could mate and lay eggs.

9. The two Seltaman villages are located at WK92-0-02-07 and WK91-0-03-02 (Royal Australian Survey Corps 1979).

10. Most dialects of Mountain Ok contain a "soft *g*" sound, which I have transcribed as *kh.* Telefol ethnographers and linguists use *g;* others sometimes use *k.*

11. Oddly, the interesting piece of information on *gymnotis* given by Flannery, that it secretes a creamy white, strong-smelling liquid from its cloacal glands, drew a complete blank with all Seltaman informants, including ritual experts.

12. Flannery received one alternate name for *P. orientalis* from the Miyanmin: *maetol.* Flannery published *ibim* alone as the Telefol term, but Robert Brumbaugh tells me there is a phalanger species in which the two sexes are called *aligaan* and *ibim.*

The English *r* and *l* sounds are not distinctive in the Mountain Ok dialects. Nor are certain voiced and unvoiced consonants distinguished when the consonant appears in medial position. Thus the spellings *ariken* and *aligen* are simply alternate English spellings of the same word.

13. Somewhat misleadingly, Flannery reports in *Mammals of New Guinea* that *D. goodfellowi* is not found south of the Sepik, and certainly the Seltaman hunting range is south of the Sepik. Elsewhere, however, he and Seri open the door to a more southerly possibility by commenting that decorative material incorporating *goodfellowi* tails came to them from the area of the Om River Valley, north of Telefomin (Flannery and Seri 1990:185). The Om River flows southward; in fact it becomes the Strickland. Fisher and Menzies were of the opinion that *goodfellowi* could be present in or near the Murray Valley (K. Fisher, pers. com., 1993). Tabubil, where the pets were located, is considerably south of the Sepik, but the keepers of the pets, who bought them at the local market, did not know their points of origin.

14. More familiar under the name *yema,* at least for Morren's Miyanmin, was the Huon tree kangaroo, *Dendrolagus matschiei.* Morren collected five complete specimens and some crania. Four of the five completes were from above 2000 meters in the Donner Range: not a lowland type! (Morren 1989:128-129). Flannery acknowledges a great similarity between Goodfellow's and the Huon, but never mentions that the Huon might be found elsewhere than around Huon Bay.

15. An earlier name for *R. steini* was *R. ruber:*

16. *Praetor* is the main *sanuk* of the Eastern Miyanmin area; it is reported to have an overwhelming food preference for fresh taro (Morren 1989:132).

17. Menzies mentions an *Echymipera* unlisted in Flannery, *E. echinista,* but it is not particularly large (J. Menzies, pers. com., 1993).

18. A very parallel taxonomic and descriptive situation for giant rats is reported by Bulmer and Menzies for the Kalam of the Eastern Highlands. The Kalam have two terms *(mosak* and *alon)* that are used both as generic-inclusives and as specifics, with one of them *(mosak)* often being broken down into a light-colored terrestrial type *(mosak kloy)* and an "ordinary *mosak,*" which is arboreal and black-furred. At the time of Bulmer and Menzies's research, *M. aroensis* had not been recognized as distinct from *M. rothschildi.* The one specimen of *mosak* trapped while visiting the Kalam was typed at the time as *M. rothschildi* (Bulmer and Menzies 1972-1973, part 2:89-90).

19. The *tr* of *trossin* is simply another way of representing the initial flap in Telefol, often represented with *r, ur,* or *dr.* I speculate that the terms *trossin, resen, ureseen* (a giant rat name given by Telefomin to Dan Jorgensen), and *wares* are all transforms of one another. This does not mean they inevitably signify the same giant rat species.

20. This is called *idam* by Morren's Miyanmin (1989:133).

REFERENCES

Atran, Scott
1990 *Cognitive Foundations of Natural History.* New York: Cambridge University Press.

Barth, Fredrik
1975 *Ritual and Knowledge among the Baktaman.* New Haven: Yale University Press.
1987 *Cosmologies in the Making.* New York: Cambridge University Press.

Beehler, Bruce, T. K. Pratt, and D. Zimmerman
1986 *Birds of New Guinea.* Princeton, N.J.: Princeton University Press.

Berlin, B., D. Breedlove, and P. Raven
1973 General Principles of Classification and Nomenclature in Folk Biology. *American Anthropologist* 75:214-242.

Brumbaugh, Robert
1980 A Secret Cult in the West Sepik Highlands. Ph.D. diss., SUNY Stony Brook.

Bulmer, R., and J. Menzies
1972-1973 Karam Classification of Marsupials and Rodents. Parts 1 and 2. *Journal of the Polynesian Society* 81:472-499, 82:86-107.

Bulmer, R., and M. J. Tyler
1968 Karam Classification of Frogs. *Journal of the Polynesian Society* 77:333-385.

Devlin, J., and G. Naismith
1977 *The World of Roger Toy Peterson.* New York: New York Times Books.

Diamond, J.
1966 Zoological Classification of a Primitive People. *Science* 15:1102-1104.
1991 Interview Techniques in Ethnobiology. In *Man and a Half: Essays in Pacific Anthropology and Ethnobiology in Honour of Ralph Bulmer,* ed. A. Pawley, 83-86. Auckland: The Polynesian Society.

Dwyer, Peter
1976a An Analysis of Rofaifo Mammal Taxonomy. *American Ethnologist* 3:424-445.
1976b Beetles, Butterflies, and Bats: Species Transformation in a New Guinea Folk Classification. *Oceania* 14:188-205.
1990 *The Pigs That Ate the Garden: A Human Ecology from Papua New Guinea.* Ann Arbor, Mich.: University of Michigan Press.

Flannery, Timothy
1990 *Mammals of New Guinea.* Brisbane, Qld.: The Australian Museum; Robert Brown and Associates.

Flannery, T., and L. Seri
1990 The Mammals of Southern West Sepik Province, Papua New Guinea: Their Distribution, Abundance, Human Use, and Zoogeography. *Records of the Australian Museum* 42:173-208.

Forge, Anthony
1970 Learning to See in New Guinea. In *Socialization: The Approach from Anthropology,* ed. Philip Mayer. Association of Social Anthropologists Monograph, no. 8. London: Tavistock.

Grice, Paul
1989 *Studies in the Ways of Words.* Cambridge: Harvard University Press.

Hyndman, David
1979 Wopkaimin Subsistence: Cultural Ecology in the New Guinea Highland Fringe. Ph.D. diss., Anthropology and Sociology, University of Queensland.
1984 Hunting and the Classification of Game Animals among the Wopkaimin. *Oceania* 54:289-309.

Jorgensen, Dan
1981 Taro and Arrows: Order, Entropy, and Religion among the Telefolmin. Ph.D. diss., University of British Columbia.

Mervis, Carolyn B., and Eleanor Rosch
1981 Categorization of Natural Objects. *Annual Review of Psychology* 32:89-115.

Morren, George E. B.
1986 *The Miyanmin: Human Ecology of a Papua New Guinea Society*. Studies in Cultural Anthropology, no. 9. Ann Arbor, Mich.: UMI Research Press.
1989 Mammals of the East Miyanmin Area, Telefomin District, Papua New Guinea, with Notes on Folk Knowledge and Taxonomy. *Science in New Guinea* 15 (3): 119-135.

Rosch, Eleanor
1975 Universals and Cultural Specifies in Human Categorization. In *Cross-Cultural Perspectives on Learning,* ed. R. W. Brislin and W. J. Lonner. New York: Wiley.

Royal Australian Survey Corps
1979 Papua New Guinea Topographic Survey Sheet 7287. Edition 1, Series T601. N.p.: The Corps.

Segall, M. H., D. T. Campbell, and M. J. Herskovitz
1966 *The Influence of Culture on Visual Perception.* Chicago: Bobbs-Merrill.

Whitehead, Harriet
1994 The Gender of Birds in a Mountain Ok Culture. In *Naturalizing Power: Essays in Feminist Cultural Analysis,* ed. Sylvia Yanagisako and Carol Delaney. New York: Routledge.