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# KALAM CLASSIFICATION OF REPTILES AND FISHES

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## INTRODUCTION

This paper reports ethnographic and herpetological data obtained among the Kalam-speaking<sup>(1)</sup> communities of the Upper Kaironk Valley and adjacent areas in the Simbai region of the Madang District, Papua New Guinea, between January 1960 and December 1973. Information on periods and location of field work, and on methods employed, may be found in Appendix A.

We attempt to provide a comprehensive statement of our information on Kalam knowledge and belief concerning reptiles and fish, draw attention to ways in which these contrast with Kalam lore concerning other animal groups, and discuss the distaste and fear with which Kalam, like many other human populations, view certain kinds of reptiles.

### 1. DISTRIBUTION OF REPTILES AND FISHES IN THE KAIRONK VALLEY REGION

1.1 Most of the land used by members of the Kalam-speaking communities of the Upper Kaironk Valley lies above 1,500 m, and the ecological zones with which these people are most familiar lie between 1,500 m and the crests of the forested ridges which reach 2,700 m on the

1. Spelled "Karam" in previous publications, e.g. Bulmer & Menzies 1972-73. In changing to "Kalam" we abide by a 1973 decision of six research workers then engaged in preparing Kalam materials for publication: B. G. Biggs, R. Bulmer, A. K. Pawley, I. Riebe, L. & H. Scholz.

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northern, Schrader Range, side of the valley, and 2,300 m on the southern, Bismarck Range, side. While many people occasionally visit relatives or go on hunting expeditions to lower-lying areas down to perhaps 800 m, and a few have gardens between 1,200 and 1,500 m, none appear to be as familiar with the flora and fauna of these lower altitude zones as they are with plants and animals found above 1,500 m.

This is important, as the number of species of reptiles and fishes found above 1,500 m in the Kaironk region, as elsewhere in the New Guinea Highlands, is small compared with that of species found at lower altitudes. In the Upper Kaironk Valley there are no snakes known to be harmful to man, large snakes are extremely rare, and there are no large lizards. We have recorded no fishes other than eels.

In the forest above 2,200 m, we obtained only two reptiles, the small arboreal skink *Lobulia elegans* (between 1,950 and 2,500 m) and the small terrestrial skink *L. stanleyana* (in clearings and landslide areas to 2,400 m, and very common in garden zones at lower altitudes). The larger terrestrial skink *Sphenomorphus* sp. nr. *jobiensis*, obtained by us in old gardens and bush-fallow between 1,800 and 2,100 m, is said by Kalam to be present also in forest to about 2,400 m.

Between 1,500 and 2,100 m, in the gardens, grasslands, bush-fallow and casuarina fallow, we obtained six additional skink species, four of them terrestrial and subterranean (*Emoia baudini*, *E. pallidiceps*, *Sphenomorphus leptofasciatus* and *S. darlingtoni*) and two arboreal (*Prasinohaema flavipes* and *P. prehensicauda*), all of which are relatively small in size; one agamid lizard or "dragon-lizard", *Goniocephalus nigrigularis*; one gecko, *Lepidodactylus* sp.; one Colubrid snake, the grass-snake or water-snake *Amphiesma montana*, and the smaller and apparently harmless terrestrial and subterranean elapid snake *Toxicocalamus loriae*, both of which are variable in coloration. Pythons larger than *Chondropython* are reported by Kalam as present but very rare in bush-fallow and remnant oak forest up to about 2,200 m. The species concerned may possibly be *Python boeleni* (see 2.3.4). Eels (*Anguilla interioris* and possibly also *A. marmorata*) are present in the Kaironk River and its tributaries, but no other indigenous fish were recorded. Since 1965, *Tilapia*, introduced by the Administration, have been kept in a few small fish ponds in the Upper Kaironk Valley.

In forest and bush-fallow up to about 1,800 m in areas adjacent to the Upper Kaironk Valley, the arboreal green python, *Chondropython viridis*, is found; and it is possible that the tree-snake, *Boiga irregularis*, which is common to lower altitudes, is also found up to that altitude in these areas.

Judging from informants' statements, and from collections made by Dr. G. G. Jackson at Yhal in the Lower Kaironk Valley, a wide range of larger, and in some cases dangerous, reptiles is found at altitudes between 600 and approximately 1,300 m. These include two species of monitor lizards (VARANIDAE); the pythons *Python amethystinus* and *Liasis albertisi*, of which the former is known to grow to 8.4 m in length; the harmless and relatively small colubrid snakes *Dendrelaphis* sp. and *Stegonotus* sp.; and two elapid snakes, the Death Adder, *Acanthophis*

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TABLE A: LIST OF REPTILES RECORDED IN THE KAIRONK VALLEY

Species	Altitudinal zones <sup>(1)</sup>				Kalam taxa <sup>(2)</sup>
	I	II	III	IV	
<b>SAURIA</b>					
<b>GEKKONIDAE—Geckoes</b>					
<i>Cyrtodactylus loriae</i> (Boulenger)	—	—	—	+	?
<i>Cyrtodactylus mimikanus</i> (Boulenger)	—	—	—	+	?
<i>Lepidodactylus</i> sp.	—	—	+	+	<i>mwlk-ps</i> (2.2.1)
<b>AGAMIDAE—Dragon-lizards</b>					
<i>Goniocephalus nigrigularis</i> Meyer	—	—	+	+	<i>aypot</i> (2.1.2)
<b>SCINCIDAE—Skinks</b>					
<i>Lobulia stanleyana</i> (Boulenger)	+	+	+	+	<i>kls</i> (2.1.1), <i>mabdagol</i> (2.1.2)
Common Skink; Red-tailed Skink					<i>pymakol</i> (2.1.8)
<i>Lobulia elegans</i> (Boulenger)	+	+	—	—	
Beech Skink					
<i>Prasinochaema prehensicauda</i> (Loveridge)	—	+	+	?	<i>sydn</i> (2.1.6)
Casuarina Skink					
<i>Prasinochaema flavipes</i> (Parker)	—	+	+	?	<i>mañmod</i> (2.1.7)
Tree Skink					
<i>Sphenomorphus leptofasciatus</i> Greer & Parker	—	+	+	+	<i>ñgñolom</i> (2.1.9)
Banded Skink					
<i>Sphenomorphus darlingtoni</i> (Loveridge)	—	+	+	?	<i>mamñ</i> , (2.1.4)
Begonia Skink					
<i>Sphenomorphus</i> sp.nr. <i>jobiensis</i> (Meyer)	?	+	+	?	<i>komā</i> (2.1.5)
Bush Skink					
<i>Emoia baudini</i> (Dumeril & Bibron)	—	—	+	+	<i>mas</i> (2.1.3)
Ant Skink					
<i>Emoia pallidiceps</i> De Vis	—	+	+	?	<i>mas</i> (2.1.3)
Ant Skink					
<i>Emoia kordoana</i> (Meyer)	—	—	—	+	?
<i>Eugongylus rufescens</i> (Shaw)	—	—	?	+	?
<b>VARANIDAE—Monitors or Goannas</b>					
<i>Varanus indicus</i> (Daudin)	—	—	—	+	<i>wbl</i> (2.2.3)
Water Monitor					
<i>Varanus prasinus</i> Schlegel	—	—	—	+	<i>wbl km</i> (2.2.3)
Emerald Monitor					
<b>SERPENTES</b>					
<b>BOIDAE—Pythons and Boas</b>					
<i>Python amethystinus</i> (Schneider)	—	—	—	+	<i>nm</i> (2.3.9)
Amethystine Python					
<i>Python boeleni</i> (Brongersma)	—	?	?	?	<i>?ymgwp</i> etc (2.3.4)
<i>Liasis albertisi</i> Peters & Doria	—	—	—	+	?
<i>Chondropython viridis</i> (Schlegel)	—	—	?	+	<i>klñan</i> (2.3.3)
Green Python					
<b>COLUBRIDAE—Colubrid Snakes</b>					
<i>Amphiesma montana</i> (Jeude)	—	+	+	+	<i>soyñ</i> (2.3.2)
Grass Snake					
<i>Stegonotus</i> sp.	—	—	—	+	?
<i>Dendrelaphis</i> sp.	—	—	—	+	?
<i>Boiga irregularis</i> (Merrem)	—	—	—	+	?
Tree Snake					
<b>ELAPIDAE—Elapid Snakes</b>					
<i>Toxicocalamus loriae</i> (Boulenger)	—	—	+	+	<i>soyñ</i> (2.3.2)
<i>Micropechis ikaheka</i> (Lesson)	—	—	—	+	?
Small-eyed Snake					
<i>Acanthophis antarcticus</i> (Shaw)	—	—	—	+	<i>sataw</i> (2.3.7)
Death Adder					

NOTES:

1. Zone I = Forest 2300–2700 m.  
Zone II = Forest, forest-edge gardens and bush-fallow 1950–2300 m.  
Zone III = Habitations, grassland, gardens, fallow and streamsides, 1500–1950 m.  
Zone IV = Areas outside Upper Kaironk Valley but within one day's walk, 600–1500 m.
2. Kalam taxa should not be assumed to equate precisely with species. See Section 2.

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*antarcticus*, and the Small-eyed Snake, *Micropechis ikaheka*, bites of which can be fatal to man.

Two additional gecko species and two additional skink species were also obtained at lower altitudes (see Table A). A legless lizard, or "snake-lizard" (*Lialis jicari*), is probably also present up to about 1,300 m, so it may be that one or other of the Kalam taxa which we have ascribed to an unidentified snake or snakes in fact refers to this distinctive creature.

Of lowland reptiles other than snakes and lizards, Kalam know of crocodiles in the Ramu by repute, and import crocodile teeth for magical purposes, but most of the people of the Upper Kaironk appear to have had no knowledge of turtles prior to Australian contact.

We do not know what altitudes fish other than eels reach in the local rivers and streams, but certainly the Jimi and its northern tributaries up to at least 700 m contain several species of catfish (PLOTOSIDAE and TACHYSURIDAE) some of which grow to a considerable size, and small fish including gobies, gudgeon and rainbowfishes.<sup>(2)</sup>

1.2 Biological study of the reptiles of New Guinea is not well advanced, even compared with the study of New Guinea birds and mammals. Although the snakes and larger lizards are reasonably well known, the smaller lizards (geckoes and skinks) present many taxonomic problems. In particular, the taxonomy of New Guinea skinks, which are numerous and diverse, is currently undergoing comprehensive revision.

### 2. KALAM TAXA APPLIED TO REPTILES AND FISH

2.0 In presenting the Kalam classification of reptiles and fish, two problems arise. One is that the lack of personal familiarity of the upper Kaironk people with the larger, more spectacular and more dangerous species leads to inconsistencies and anomalies in their classification of these. The other is that we believe that this is one field of animal classification in which some of our informants may have significantly restructured and rationalised their taxonomy over the last ten years. In this period, several of them have travelled to other parts of Papua New Guinea (and, in four cases, to Australia or New Zealand) and thus had opportunity for direct observation of many kinds of creatures hitherto unknown to them; many of them have had more opportunity than previously to visit lower-lying areas in the general region of the Kaironk Valley itself, either accompanying Administration or Mission personnel, or taking advantage of pacification and travelling privately; and most of the younger ones have been influenced by rudimentary school education. It is also possible that discussion of biblical stories in Kalam has caused some reformulation of the concept of *sataw* ("dangerous serpent").

Unfortunately, we cannot be as sure that significant changes have occurred as we would like to be, because there is always the possibility that formulations which we take to be new were not made to us in the early years of our enquiries merely because we did not ask the right questions. We can only say that we have no evidence that Kalam had,

2. Whitley 1959:518.

when we were first working with them, any taxa corresponding to "reptiles collectively" or "fish collectively", or embracing both these groups. Within the reptiles there also appeared to be no taxon corresponding to "lizard" and there was some doubt as to whether there was a taxon corresponding to "snake". In this, Kalam taxonomy differed from that of the neighbouring Maring people of the Simbai and Jimi Valleys, who include all lizards in a single major taxon, *tum*,<sup>(3)</sup> and of the Kyaka Enga of the Baiyer Valley region of the Western Highlands, among whom Bulmer had previously worked. The Kyaka included all reptiles and fish, as well as scorpions, worms, certain insects and especially insect larvae, and certain other invertebrates, in a single major taxon, *kau*.

In contrast, the Kalam, so far as we could discover up to about 1966, applied the terms *yñ* (G) or *twm* (K)<sup>(4)</sup> to skinks, but placed the dragon-lizard (*aypot* or *kwom*), the gecko (*mwlkps* or *wowv*) and also *wbl*, the monitor lizards, with which they had little familiarity, in separate contrasting categories. They used *soyñ* (G) or *syñ* (K) for the snakes with which they were most familiar, but disputed amongst themselves the extent to which this taxon extended to other snakes with which they were not familiar; they used *sataw* for venomous snakes and other terrifying but unfamiliar reptiles, used *tok* and *woknañ* for eels, and *kobsal* for fish other than eels which they had heard of.<sup>(5)</sup>

However, in 1971–72 we recorded the use of *yñ*, by several informants, to apply not just to skinks, but, in some contexts, to all locally known reptiles, as described below. Eels and other fish were not included in *yñ*, nor did we record a single "traditional" taxon which included both eels and other fish. Nevertheless, the adoption of tinned fish as a frequent item in local diet has led to an equation of tinned fish with eels in some dietary regulations; and in 1973 we recorded the use of the loan-word *pys* (P.E. "Pis", Eng. "Fish") applied to eels as well as exotic fishes.

### 2.1 *Taxa applied to skinks*

Eight species of skinks (SCINCIDAE) may be described as common in the Upper Kaironk Valley (*Lobulia stanleyana*, *L. elegans*, *Prasinohaema prehensicauda*, *P. flavipes*, *Emoia pallidiceps*, *Sphenomorphus leptofasciatus*, *S. darlingtoni*, *S. sp. nr. jobiensis*), and certain of these are abundant and very frequently encountered (notably *L. stanleyana*, *P. prehensicauda*, *E. pallidiceps*). We obtained single examples of two other species, *Emoia baudini* near the lower altitudinal limit of the Upper Valley, at 1,600 m; and *Eugongylus rufescens*, of which our specimen is of uncertain provenance and may have come from outside the Upper Valley. G. G. Jackson, collecting in the Lower Kaironk Valley of altitudes below 1,500 m, obtained additional specimens of *E. rufescens* and *E. baudini* and also

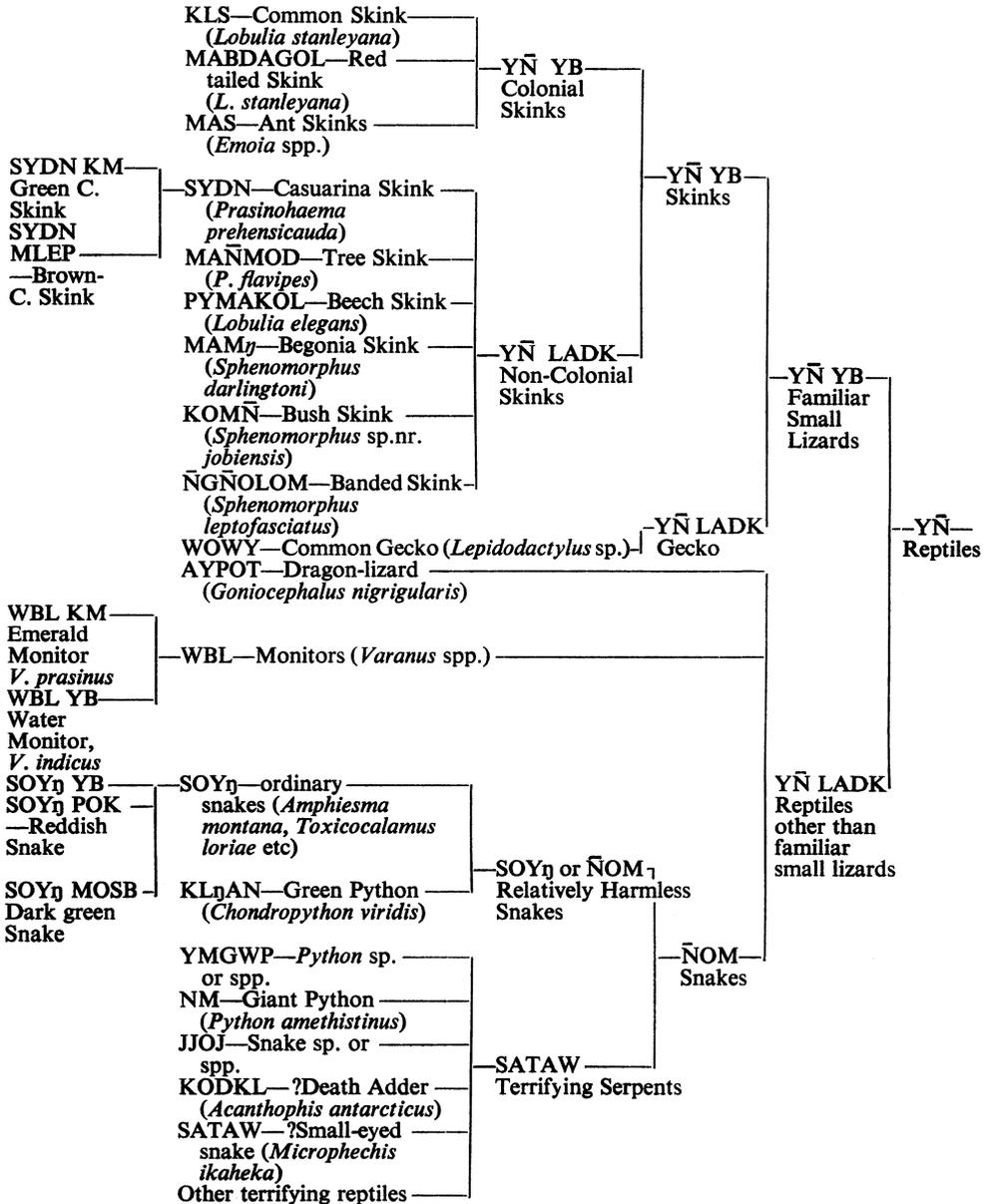
3. Clarke 1971:245.

4. (G) and (K) indicate different dialects of Kalam, both of which are spoken in the Upper Kaironk Valley. (G) is *ty mnm* dialect, spoken in the Asai Valley and other areas to the north, and also by the majority of people at Womk and Gobnem in the Kaironk. (K) is *etp mnm*, spoken in the Simbai Valley and much of the Upper Kaironk, including at Kaytog settlement.

5. Bulmer 1967:7.

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FIGURE A: KALAM CLASSIFICATION OF REPTILES ARRANGED AS TAXONOMIC HIERARCHY



examples of *E. kordoana*. All these skinks are fairly “typical” small lizards, the different species ranging in maximum length from approximately 120 to 300 mm, with elongated bodies, medium to long tails, well-formed fore- and hind-limbs, and smooth skins lacking tubercles and crests.

In the reptile fauna of the Kaironk Valley, skinks both form a very obvious “natural” grouping and include several species which are much the most familiar reptiles to Kalam. The synonyms *yñ* (G) and *twm* (K) apply primarily to this group, though these terms also have several more extensive and more restricted applications, as discussed below. The eight common skink species are placed in nine Kalam taxa with names which are optionally, but frequently, pre-posed by the terms *yñ* or *twm*; this is not the practice with any other Kalam reptile names, even though all locally known reptiles are in the widest sense of the terms *yñ* or *twm*.

Four of these nine taxa appear, on present evidence, to correspond precisely with zoological species (*pymakol* = *Lobulia elegans*; *sydn* = *Prasinohaema prehensicauda*; *ñgñolom* = *Sphenomorphus leptofasciatus*; *mamj* = *S. darlingtoni*); two (*kls*, *mabdagol*) split what zoologists regard as a single species (*Lobulia stanleyana*) into forms which Kalam regard as biologically as well as morphologically distinct; one (*mas*) is regarded by Kalam as being somewhat variable in appearance, though they attach no significance to this variation, and appears, in fact, to correspond to two closely related species, the locally very common *Emoia pallidiceps* and the lower-altitude species *E. baudini*; two appear to correspond locally, and in terms of specimens we have collected, with single zoological species (*mañmod* = *Prasinohaema flavipes*; *komñ* = *Sphenomorphus* sp. nr. *jobiensis*), but some Kalam informants say that they also include different forms found at higher or lower altitudes which we did not collect, though they do not have standard names to distinguish these.

One taxon, *sydn* (*P. prehensicauda*) is subdivided by Kalam into named groupings on the basis of colour (see 2.1.6).

Kalam appear to identify most skinks by instant recognition in terms of typical configurations of shape and colour. In statements about the characters they utilise, and in arguments about disputed identifications, they refer to body proportions (thickness of trunk, relative length of tail, shape of head, relative size and shape of limbs), overall size, colour pattern, scale pattern and characteristic movement. They are also obviously pre-disposed to limit the range of possible identifications by the context in which a creature is found, and their knowledge of habitats is detailed and accurate. As an illustration of their conceptualisation of body proportions, the following statement by Wñ may be reported: “*Kls* has a long tail, *mabdagol* rather shorter. A forked tail is found on some *kls*. *Mas* has a long tail. *Mamj*’s tail is short, with a lot of fat, like the meat of an eel. *Komñ*’s tail is fairly long, *pymakol*’s long. *Ñgñolom*’s is short, but a little longer than *mamj*’s. *Mañmod*’s is long, *sydn*’s is rather shorter.” (They are, incidentally, well aware that tails which grow in replacement of those shed are shorter and stubbier than the originals.) They are also well informed, or claim to be so, about the diet and breeding habits of most, but not all, of these taxa. The consistency of their identifications is demon-

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strated by the fact that only 10 out of 157 specimens collected (see Table B) were placed by their original captors in taxa which did not correspond with species as listed above, and six of these identifications were disputed by other informants who placed them in the “correct” taxa. It is possible that the remaining four are cases, fortunately rare, of collectors tempted to trade on the authors’ ignorance and cheating them by knowingly misidentifying specimens so that they fell in a taxon, (*komñ*), for which they would pay a higher than average reward.

TABLE B: KALAM IDENTIFICATIONS OF SKINKS<sup>(1)</sup>

SPECIES	KALAM TAXA									Totals
	<i>mas</i>	<i>kls</i>	<i>mabdagol</i>	<i>pymakol</i>	<i>mañmod</i>	<i>sydn</i>	<i>komñ</i>	<i>ñgñolom</i>	<i>mamy</i>	
<i>Emoia pallidiceps</i>	23	—	1*	—	—	—	—	—	—	24
<i>Emoia baudini</i>	1	—	1*	—	—	—	—	—	—	2
<i>Lobulia stanleyana</i>	3*	48	14	—	—	—	—	—	—	65
<i>Lobulia elegans</i>	—	—	—	7	—	—	—	—	—	7
<i>Prasinohaema flavipes</i>	—	—	—	—	9	—	—	—	—	9
<i>Prasinohaema prehensicauda</i>	—	—	—	—	—	28	4	—	—	32
<i>Sphenomorphus</i> sp.nr. <i>jobiensis</i>	—	—	—	—	—	—	3	—	—	3
<i>Sphenomorphus leptofasciatus</i>	—	—	—	—	—	—	1*	7	—	8
<i>Sphenomorphus darlingtoni</i>	—	—	—	—	—	—	—	—	7	7
Totals	27	48	16	7	9	28	8	7	7	157

<sup>(1)</sup> Identifications by captors are here tabulated. Those disputed or corrected by other informants are marked with an asterisk (\*).

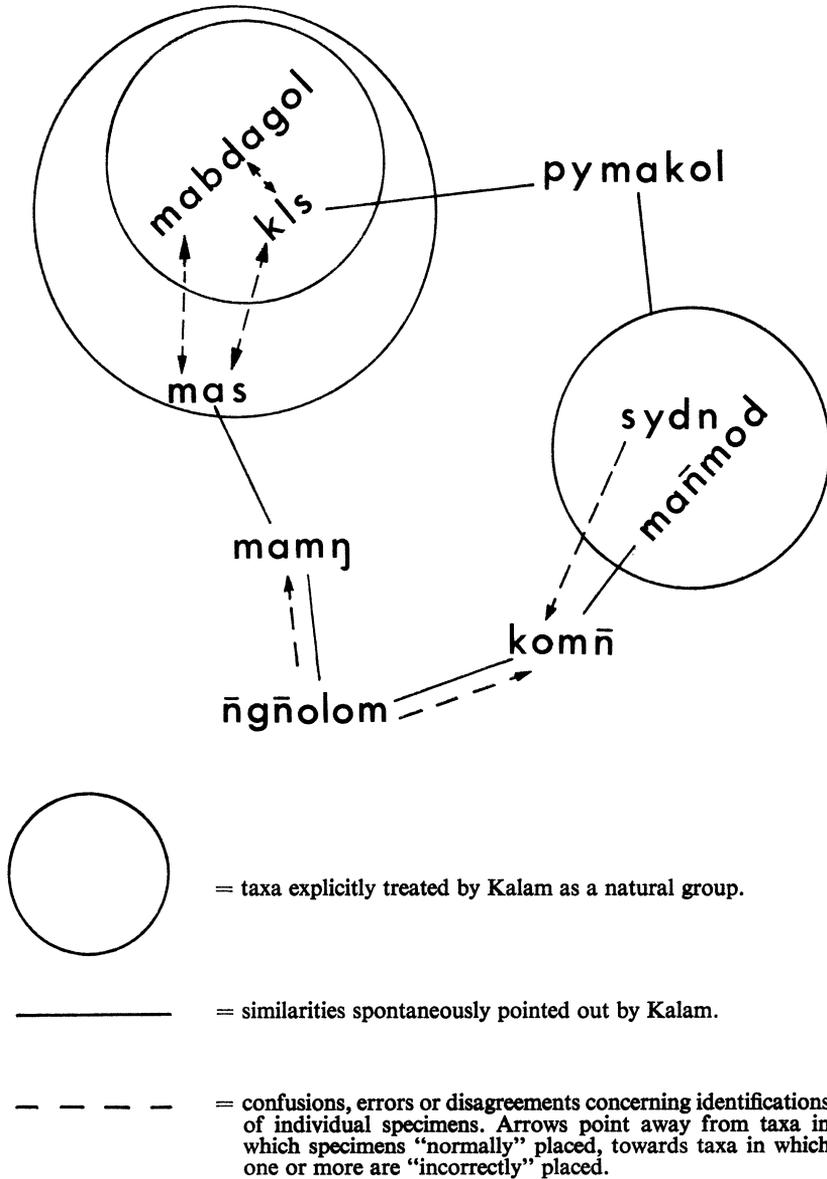
The consistency of Kalam identifications is impressive, particularly when the variability in colour and markings in certain species, which relates in some cases to sexual differences, in others to age, and in others to factors which are not yet understood, is taken into account.

Figure B attempts to present the relationships between skink taxa as perceived by Kalam. They explicitly recognise three sub-groupings: *kls* and *mabdagol* (both *Lobulia stanleyana*) which are seen as morphologically very similar and both to be colonial breeders which indeed often share the same colonies; *kls*, *mabdagol* and *mas* (*Emoia* spp.), which are seen as morphologically similar, overlapping in habitat and allegedly sometimes found in the same colonies, and all three colonial breeders, though *mas* on a much smaller scale than *kls* and *mabdagol*; and *sydn* (*Prasinohaema prehensicauda*) and *mañmod* (*P. flavipes*) which are seen as morphologically and biologically similar, both being viviparous, and “sleeping together”, which is to say that they overlap considerably in their arboreal habitats. Kalam variously describe *kls* + *mabdagol*, or *kls* + *mabdagol* + *mas*, as *yñ yb* (“true” *yñ*) in the narrowest sense, to the exclusion of all other skink taxa: but we have recorded no regular designation for the covert category consisting of *sydn* + *mañmod*.

Additional relationships spontaneously described by Kalam, and indicated in Fig. B, include *pymakol* (*Lobulia elegans*)—*kls* (*L. stanleyana*) in shape, size, and, in part, colour pattern; *pymakol*—*mañmod* (*Prasinohaema*

*flavipes*)—*komñ* (*Sphenomorphus* sp. nr. *jobiensis*) in forest habitat and arboreal nature (though it is possible that forms of *mañmod* and *komñ* other than the species here listed are referred to); *mamñ* (*Sphenomorphus darlingtoni*)—*mas*, (*Emoia* spp.), in size, colour and overlap of habitat; *mamñ*—*ñgñolom* (*S. leptofasciatus*) in shape and in overlap of habitat; and *ñgñolom*—*komñ* in shape.

FIGURE B: RELATIONSHIPS BETWEEN KALAM TAXA APPLIED TO SKINKS



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Relationships indicated by “incorrect” or disputed identifications were *kls*—*mabdagol* (3 cases), *kls*—*mas* (4 cases), *mabdagol*—*mas* (4 cases), *komñ*—*ññolom* (1 case), *sydn*—*komñ* (4 cases, mentioned above).

In general, the relationships of morphology and biology adduced by Kalam accord well with the most recent taxonomic revision of New Guinea skinks,<sup>(6)</sup> which we follow in this paper. This applies particularly to their association of *sydn* with *mañmod*, and *pymakol* with *kls*. Prior to Greer’s revision, *sydn* (*Prasinohaema prehensicauda*) together with *pymakol* (*Lobulia elegans*) and *kls* (*L. stanleyana*) were placed in the genus *Scincella*, whereas *mañmod* (*P. flavipes*) was, together with *komñ*, *mamj* and *ññolom*, placed in the genus *Sphenomorphus*.

In reviewing individual taxa, we may take first the trio *kls*, *mabdagol* and *mas*, which, together with *sydn*, are the most familiar of all to Kalam, and which they tend to name first if asked to provide a list of *yñ*. Unlike other local skinks, these are colonial nesting species, systematically exploited by women for their eggs. Breeding colonies are excavated with digging sticks, and the tiny eggs, in the case of *Lobulia stanleyana* in quantities of up to perhaps 300 gm, are tightly packed in cordyline leaves and cooked either in the open fire or in the earth-oven.

2.1.1 *Kls* (homonym: “strong, forceful, fierce, stubborn”; “flexed” (of muscles); *kab kls*—hard, strong stones, e.g. which will not splinter in fire for earth-oven cooking) is applied to the most familiar form of the commonest of local small lizards, the skink *Lobulia stanleyana*, 48 of 65 specimens of which were placed in this taxon. *L. stanleyana* is found in gardens, bush- and casuarina-fallow and around homesteads, and indeed often enters houses. It was also collected in forest clearings and landslide areas up to 2,400 m. Breeding colonies were noted in crevices in rock faces and in exposed clay banks by sunny ridge-side tracks in garden areas.

In distinguishing *kls* from *mabdagol* (2.1.2) and *mas* (2.1.3), which are of similar size and conformation and often found in the same localities, Kalam note that *mas* is darker than the other two, and has a distinctive pattern of marks on the back of the head which is present even in the newly hatched young. *Mabdagol* is said not to grow quite as large as *kls* or *mas*, and normally to have a red or orange tail. Any individual clearly exhibiting this character is identified as *mabdagol*. Similarly, presence of a yellow belly identifies a creature as *kls*. Informants say that only mature *kls* have yellow bellies, younger specimens having a whitish undersurface, like *mabdagol*. However, a few large *L. stanleyana* specimens were collected which had either whitish or copper-coloured bellies, and these were also identified as *kls*. Nevertheless, difficulties in identification occur with individuals which lack distinctive markings on the back of the head, red tails, and yellow bellies, and these cases account for the small number of disputed identifications we recorded. The general tendency is to place these specimens in the *kls* taxon. However, Majnep has argued that some anomalous cases, notably of large and unusually dark-coloured *mabdagol*, are the result of hybridisation between this form and *mas*.

6. Greer 1974.

While there no question that *mas* is a distinctive zoological species or, probably, group of species (*Emoia pallidiceps*, and apparently also *E. baudini*), it has so far proved impossible to find morphological characters which would justify treatment of *kls* and *mabdagol* as separate species. Although the yellow belly appears to be associated with breeding condition, it is not clear if the red tail is associated with sex or age, or is merely a polymorphic trait. Kalam say that they are often found in the same breeding colonies. One informant (Wñ) asserted that, apart from the size and colour differences noted above, *kls* produces tougher-skinned eggs than *mabdagol*. The only allegedly *mabdagol* eggs obtained, a set of eight measuring  $10.0\text{--}12.5 \times 7.0\text{--}7.6$  mm, were smaller than the *kls* eggs measured, a set of 49 which ranged between  $12.5\text{--}18.0 \times 6.6\text{--}12.2$  mm. (While reptile eggs change in dimensions as they incubate, hatchings in this second batch occurred from 2 to 31 days after collecting, which could suggest that they were at all stages of development, except that some *kls* eggs from another batch took up to 51 days to hatch. Unfortunately, no hatchings were obtained from *mabdagol* eggs.)

2.1.2 *Mabdagol* or *dagol* (*mab*—"tree, timber, firewood, fire"; *dagol* possibly etymologically "kindling". Homonym is (*bay*) *dagol*, a fungus taxon with orange-red colouring, like the tail of the skink). Fourteen out of 65 specimens of *Lobulia stanleyana* collected were assigned to this taxon. For discussion see 2.1.1.

2.1.3 *Mas*. Taxon applied to 23 out of 24 specimens collected of *Emoia pallidiceps*, to one of the two examples obtained of *E. baudini*, and to 3 out of 65 *Lobulia stanleyana*. For characters by which Kalam distinguish this from most similar taxa, see 2.1.1. Although present in gardens, *E. pallidiceps* appears to be most characteristically found in relatively open short grass. Informants says that it sometimes nests in colonies, though on a much smaller scale than *kls* and *mabdagol*. The largest number of eggs brought in from one breeding area was 14, in contrast to up to 200 from a *kls* colony. It is said that they favour nests of ants (apparently *Iridomyrmex anceps* (Roger)) in which to lay their eggs, and that the ants look after the skink eggs in the same way as the Fairy Wren looks after the egg of the Fantailed Cuckoo. One name for the ant concerned is *goj twm-sek* "ant skink-possessing".

2.1.4 *Mamy* (homonym applied to flowering plants of the forest, ?*Begonia* sp. or spp.) is the small terrestrial skink *Sphenomorphus darlingtoni*, which contrasts markedly in shape and colour with the three taxa so far discussed, and indeed with any other local skinks with the partial exception of *komñ* (2.1.5). It is thicker-set than *kls* and *mas*, with a proportionately much shorter and thicker tail. Its overall coloration is very dark, though the belly is often deep red and in some specimens the tail has a noticeable bluish tinge. Kalam suggest that the lizard and the flower bear the same name because of the correspondences in colouring. Majnep pointed out also, in comparison of preserved specimens, that the scales of *mamy* are of very different size and shape from those of *kls*, *mas* and *mabdagol*. It is also unusual in its behaviour, being timid and slow moving, and making little attempt to escape if captured. It is described as the only skink which

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never warms itself in the sun. Wñ said that its flesh is stronger than that of most skinks, being less likely to disintegrate when cooked. It is found at streamsides and in damp garden and bush-fallow areas. Children said that the best place to search for it was in areas of the grass *Ischaemum polystachyum*. Eggs are found in the ground, never, it is said, more than two or three together, and are of distinctive appearance, the shell being fibrous in texture with longitudinal grooves. Seven specimens were collected, between 1,500 and 2,100 m.

2.1.5 *Komñ* is the taxon applied to the largest skink we collected in the upper Kaironk Valley, *Sphenomorphus* sp. nr. *jobiensis*, which grows to approximately 250 mm in length and which we obtained in mixed *Miscanthus* grass and casuarinas at 1,900 m and at a rather higher altitude in bush-fallow. It appears to be not uncommon in bush-fallow up to at least 2,200 m. Burrows with soil at the entrance, in forest at 2,500 m, were attributed to *komñ*. However, many Kalam say that there is more than one kind of *komñ*, though these are not separately named; some informants distinguish three kinds; and it is possible that as many as four different forms are in fact being described by them. These are: (i) the form that we collected, which is described as “dark” or “black” in coloration, with prominent stripes at the ear; essentially terrestrial and subterranean in habit; and common in bush-fallow and in lower reaches of the mountain forest. These accounts correspond well with *S.* sp. nr. *jobiensis*. (ii) Some say that there is a high altitude *komñ* which is arboreal; others disagree and say that this is a kind of *mañmod* (2.1.7); yet others say that when a tree-climbing hunter is surprised by a large skink emerging suddenly from epiphytes high up in a forest tree he may call this a *komñ*, but he may not examine it too closely and it may in fact be a large *pymakol* (2.1.8). (iii) Two informants, Gi and Wñ, say that there is another kind of *komñ*, distinguished by blue and red markings on its throat, which was formerly seen quite commonly in casuarina groves in garden areas between about 1,500 and 1,800 m, but which seems to have disappeared in the last few years, though it is still encountered at lower altitudes. It is described as emerging from its underground burrows to sun itself at the base of the casuarina trees. (iv) Wñ says that there is yet another much larger *komñ*, growing as big as *aypot* (*Goniocephalus nigrigularis*—2.2.2), multicoloured and with a pouchy throat, like *Goniocephalus*, which is found at lower altitudes. He says that it lays its eggs in decomposing garden trash, and that its bite is poisonous.

The “common” *komñ* is a very fast-moving and elusive creature, and thus hard to capture. Further, although Kalam show complete equanimity in handling all other common skinks except *ñgñolom* (2.1.9), they do not like grasping *komñ* because, they say, it bites viciously. We were told that women sometimes dig up *komñ* burrows, thinking that they are burrows of the small rat, *Pogonomys sylvestris*; and that *komñ* may in these circumstances either surprise them by jumping out in their faces, or actively defend its nest and eggs.

2.1.6 *Sydn* is the very common small arboreal skink of the casuarinas and other second-growth trees at altitudes up to about 2,200 m, *Prasino-*

*haema prehensicauda*. It shows sexual dichromatism, the mature males being varying shades of green, the females varying shades of brown, sometimes with roseate belly, sometimes with fairly marked barring on the upper surface. Kalam recognise them by shape, and markings, though are undoubtedly also influenced by habitat, as the only other truly arboreal skink found in the same altitudinal zone is *mañmod* (*Prasinohaema flavipes*—2.1.7). Although our Kaironk informants do not correlate the colour contrasts with sex, they regularly use the taxa *sydn km* “green *sydn*” and *sydn mlep* (“dry” or “straw-coloured” *sydn*) to distinguish them.<sup>(7)</sup> While one generally reliable informant asserted that *sydn* laid eggs in epiphytic moss high in the casuarinas, the majority view was the biologically correct one, namely that this skink is viviparous. Twenty-seven out of 31 collected specimens of *P. prehensicauda* were identified as *sydn*, 4 as *komñ* (2.1.5) (see 2.1 above).

2.1.7 *Mañmod* are arboreal skinks, larger than *sydn* (2.1.6). Several informants say there are two kinds, one present in the casuarinas where “it sleeps with *sydn*”, the other in bush-fallow and forest at higher altitudes. We have only collected the former, all nine specimens of which were *Prasinohaema flavipes*, which grows substantially larger than *P. prehensicauda* and, though somewhat similar in conformation, is distinctively marked. All informants agreed that it was normally viviparous, though one generally well-informed one said that he thought that it also sometimes laid eggs in cracks in dry timber, and in tree ferns. A white-seeded variety of bean (*Phaseolus* ? *vulgaris*), introduced to the area in the 1950s, is named *mañmod mag* (“*mañmod* eggs”) because of the similarity of the seeds to the unhatched eggs observed inside the skink.

Informants were unable to describe morphological differences between the local *mañmod* and the higher-altitude one of the forest, but said that the latter was notable for the fact that, unlike other skinks, it called. However, there was disagreement about the noise it made, which was variously imitated as a sharp barking sound and described as a whistle and as a noise rather like that made by a cicada. It is possible that some of all of these noises are made by hylid or mycrohylid frog species which Kalam do not differentiate and place in the taxa *mabas* and *gwnm*.<sup>(8)</sup>

2.1.8 *Pymakol* is the common small arboreal skink of the mountain forest, *Lobulia elegans*, of which we obtained eight specimens. Morphologically similar to *kls* and *mabdagol* (*L. stanleyana*—2.1.1, 2.1.2) and like many mature *kls* having a yellow under-surface, it is readily distinguished from any other local lizard by the geometric checker-board markings on its back. Kalam associate *pymakol* particularly with the small-leafed *Nothofagus* beech trees which grow above 2,300 m, but we obtained some specimens in forest and garden clearings at lower altitudes, and one example from a casuarina at 2,000 m. None of our informants had any knowledge of the eggs, and they speculated as to whether it might be viviparous.

7. Woodruff (1972) reports, however, that Kalam informants in the neighbouring Simbai area recognise the difference as a sex-character.
8. Bulmer & Tyler 1968:366–7; Bulmer 1968:629.

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2.1.9 *Ngñolom* is *Sphenomorphus leptofasciatus*, a terrestrial species of medium size, thick set, with tail relatively short in proportion to body, and less developed limbs than those of any other local skink. Nearest to it in shape is *mamj* (*S. darlingtoni*—2.1.4). The typical markings of *S. leptofasciatus* are very distinctive, comprising fine crossbands of pale blue-grey on the dark grey or grey-brown dorsal surfaces, which Kalam liken to the markings of *sataw* serpents (see 2.3.7), but these are not prominent in some elderly animals, as for example an aged male originally misidentified by the children who collected it as a *komñ*. Our eight specimens came from gardens and bush-fallow between 1,650 and 2,250 m, one from inside a fallen and decaying tree-fern trunk. Kalam say they are often found in or under rotten logs, and sometimes in decaying taro foliage. A behavioural peculiarity of the species which informants report, though we have not seen ourselves, is that when captured it vibrates or quivers.

*Ngñolom* is the only kind of skink which Kalam say they never eat, though according to Wñ its eggs, which are found in the roots of *Ischaemum polystachyum* grass, can be eaten.<sup>(9)</sup> The distaste and aversion which Kalam evince for *ngñolom* are discussed in 3.4.

2.1.10 *Soy-twm* (“sore-lizard”) is not known locally, but is said to be found in grasslands at lower altitudes. Gi describes it as the “cross-cousin of *mas*, but smaller than *mas*, only the size of a finger and entirely blue.” He says that it is attracted by sores and ulcers, and will go right inside a deep ulcer, so that just its tail can be seen wiggling outside. Gi claims he has seen this creature at Yhal in the Lower Kaironk Valley. Whether or not the folklore about the ulcers is correct, his description suggests that *soy-twm* may be the Blue-tailed Skink, *Emoia caeruleocauda*.

### 2.2 Other lizards

Apart from the skinks, there are two lizards in the Upper Kaironk Valley with which Kalam are very familiar, the agamid lizard or “dragon-lizard” *Goniocephalus nigrigularis* and the Gecko, *Lepidodactylus* sp. These are both very different from each other and from the skinks in their morphology and behaviour and are only considered to be *yñ* in a more extended sense of the term. Kalam also have some knowledge and folklore concerning other lizards found at lower altitudes, but the only species to which their taxa can be related with any degree of assurance are the monitors *Varanus indicus* and *V. prasinus*.

2.2.1 *Wowy*, *mwlk-ps* “blunt nose” or “nose-at-both ends”; also sometimes applied to earwigs (Dermaptera) and occasionally to other kinds of insects, *ceml* (normally applied to slugs), *mwegs* (normally applied to bush crickets, Rhaphidophorinae), *wbln* (perhaps related to the term *wbl*, applied to the monitors, *Varanus* spp. (2,2.3)), *ñony*, *añoyc*, *kwmanoyc* and *snby* were all names applied to the only gecko species recorded in the Upper Kaironk Valley, an undescribed *Lepidodactylus* sp.<sup>(10)</sup> Of these names, only the first two, which are both very commonly used, were

9. Wñ may be mistaken in identifying the eggs of *ngñolom*, as it appears probable that *S. leptofasciatus* is viviparous (Greer & Parker 1974:54).

10. This *Lepidodactylus* species has been found in other parts of the Highlands by Parker and will be described by Brown and Parker (in prep.).

known to all informants. Some of the others were said by informants who had heard them, but did not themselves use them for the local gecko, to be properly applied to different kinds of lizards found at lower altitudes. The names normally applied to insects and slugs appeared to be used somewhat idiosyncratically as nicknames for the gecko, and as an indication of disdain. There is no other creature known to Kalam, either vertebrate or invertebrate, for which we have recorded such a long list of names.

Although within the size range of the local skinks, *Lepidodactylus* is grossly different from these in shape and skin texture, and the body is much less firm to touch. According to Wñ, "the skin breaks easily, and the inside is yellow, like egg". It is said to be found characteristically in dry banana foliage and in abandoned houses, though some of our 13 specimens came from passionfruit foliage festooning casuarina trees, and from eucalypts, in the vicinity of homesteads. Both passionfruit and eucalypts are introductions since 1960 in the Kaironk Valley. None of our specimens came from altitudes above approximately 1,800 m. Although this species occurs in both natural and man-made habitats in other parts of the Highlands, it would appear, on our limited present evidence, that in the Upper Kaironk Valley it is more exclusively associated with human settlement than is any other local reptile.

Wñ, who claims to have gained familiarity with *mwlkps* during part of his boyhood spent at Aynwñ in the Kapon-speaking area of the Middle Kaironk Valley, where these creatures are more common than they are in the Upper Valley, says that they lay eggs in dead casuarina trees and on old fence posts, sticking them on with some kind of adhesive substance, in a line. He also says that the gecko makes itself a nest in dry banana foliage, sealing this with the same gluey substance, and describes a traumatic childhood experience in which he broke open such a nest, thinking it might contain insects, and a gecko jumped out and clung to his face with its claws. He screamed and ran to his mother, shouting that a *komñ* had bitten him; but she said, no, it's just a *mwlkps* and doesn't bite. The very strong antipathy which Kalam feel for geckos is discussed in Section 3.5.

Kalam who in recent years have lived in Port Moresby also call the common small house gecko (*Hemidactylus frenatus*) there a *mwlkps*, though, as Wñ says, this differs from *Lepidodactylus* in colour, conformation of eye and conformation of feet, having toes like those of *komnaŋat* (the tree frog *Litoria angiana*). Wñ said they were also noisier than the local Kaironk gecko, though this did make a ticking call.

One informant described a different *wowu* living in grasslands in the Sal Valley and in the valleys of the Jimi tributaries to the north as having the call, with which he said he was familiar: "*Waŋ-kas jalp, byn ñm agp, mon sgp, okoy okoy*". This may be rendered: "My pubic hair has grown, give me a woman; the fire is dying down, oho! oho!"

2.2.2 *Aypot* or *kwom* is the dragon lizard *Goniocephalus nigrigularis*, which is marked off from all other lizards in the upper Kaironk Valley by its much greater size (maximum length recorded 880 mm) and grossly different shape and skin quality. Not uncommon in areas up to about

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1,800 m in altitude where there are trees and thickets (e.g. near river and stream sides) it is said to have been much more common in the past, before bush vegetation was cleared very extensively from 1,650 m on up on the northern side of the valley. Although it is essentially arboreal, its eggs, which are eaten by Kalam, are laid in the ground. Unlike the skink and gecko, it is said to be frugivorous, feeding on the fruit of many kinds of wild plants including species of the family PIPERACEAE, ?*Wendlandia paniculata*, *Schefflera* sp., *Evodia* sp., *Macaranga* sp. and *Rubus* spp., and also sometimes on cultivated fruit in gardens. It is captured by hand and hunted, mainly by boys, using bow and arrow. *Aypot* is a totemic animal. Restrictions on its consumption are discussed in 3.1.

2.2.3 *Wbl* or *akan* are monitor lizards or goannas, *Varanus* spp., which are found only at altitudes considerably below 1,500 m and which grow very much larger than any lizards with which Kalam are familiar in their home area. G. G. Jackson collected two species, the Water Monitor (*Varanus indicus*) and the Emerald Monitor (*V. prasinus*), in the lower Kaironk Valley. These appear to be the forms of which Kalam have some knowledge, as they say that *wbl* swim, and also distinguish a green monitor (*wbl km*, or *wbl mjkmab*) from the ordinary kind. *Akan* was not used by Kaironk informants, but was supplied by a Kwbtsp, Simbai Valley, assistant as the dialect term for *V. indicus* in that area.

Monitors are hunted with bow and arrow, and also pulled out of their holes in the ground or in rocks, or in trees. Together with ringtail possums (especially *Pseudocheirus forbesi*) they provide the skins for hand drums.

2.2.4 *gojeb* (or ? *gojob*) was given as the name of a green tree-lizard found at lower altitudes in the Kopon area of the Kaironk Valley, said to be about the same size as *aypot* (*Goniocephalus*) and thus considerably smaller than the Emerald Monitor. Possibly this is *Dasia smaragdina*.

2.2.5 As noted above (2.2.1), some informants regard the terms *wbln*, *nyoy*, *anyoy*, *kwmanoyoy* and *snby* as properly applied not to the local gecko (*Lepidodactylus*) but to lizards found at lower altitudes, while others extend the use of *mwlpks* and *wowy* to include other lizards which they recognise to be different from *Lepidodactylus*. However, we obtained no clear descriptions of any of these creatures.

### 2.3 *Taxa applied to snakes*

Although Kalam have an extensive folklore about snakes, and there is a rich snake fauna at lower altitudes within a few hours' walk of their settlements, their lack of familiarity with all but three species much affects their classification. A further complicating factor is that, in several species, juveniles have quite different markings from adults. This is true of one of the commonest snakes in the Upper Kaironk Valley, *Toxicocalamus loriae*, and also of the pythons *Chondropython viridis*, *Python amethystinus* and *P. boeleni*. We have recorded 14 terms (primary lexemes) applied to snakes, but there is considerable doubt as to the referents of most of these.

In the generic names we apply to the pythons we follow a revision currently being prepared by Dr S. B. McDowell.

2.3.1. *Ñom*, *yñ ladk* (G) ("wild" or "useless" *yñ*) or *twm aydk* (K) are terms which may be applied to any individual snake, or to any kind or kinds of snakes collectively. If, as is probable, legless lizards (*Lialis jicari*) are occasionally encountered at lower altitudes, these would also be considered to be *ñom*.

While some informants use *soyñ* or *syñ* (2.3.2) as synonyms for *ñom*, most treat *soyñ* as a subcategory of *ñom*. *Sataw* (2.3.7) overlaps with *ñom*, being neither entirely subsumed within it nor co-extensive with it.

For *ñom pok* see 2.3.2 below.

2.3.2 *Soyñ* (G) or *syñ* (K), though occasionally used as, or asserted to be, a synonym for *ñom*, is generally restricted to smaller snakes which are seen as relatively, though certainly not completely, harmless, and contrasted with *sataw* (2.3.7) *nm* (2.3.9) etc. Most frequently, it is applied to the two common species of terrestrial snakes in the Upper Kaironk Valley, the Grass-snake or Water-snake *Amphiesma montana*, and the small elapid snake *Toxicocalamus loriae*, for which no other designations except *ñom* or *yñ ladk* are appropriate. Kalam do not distinguish between *Amphiesma* and *Toxicocalamus*, treating them as a single taxon varying only in colour pattern. *Amphiesma* is, in fact, variable, specimens collected ranging from dark steely-grey to reddish-brown and to olive green on the upper surface, in the latter case with a very beautiful pattern of green and yellow markings on the sides and a yellow undersurface. Immature *Toxicocalamus* are steely-blue-grey on the upper surface, with a yellowish belly, not unlike the darker *Amphiesma* specimens. Although when newly hatched they have bright blue and yellow markings as the sides of the neck, the blue marks appear to be lost very soon, and the diamond-shaped yellow marks are noticeable only in some larger immature specimens. In any case, Kalam appear to attach no significance to these markings. Adult *Toxicocalamus* are dark reddish-brown on the upper surface, like some *Amphiesma*, with a darker medial stripe, and yellowish belly. Kalam standardly refer to these, but also to the green and yellow *Amphiesma* specimens, as *soyñ pok* or, occasionally, *ñom pok*. Less frequently, they identify the dark coloured *Amphiesma* as *soyñ mosb*. More usually, *soyñ pok* are contrasted with the unmarked taxon referred to simply as *soyñ*.

The only tree-snake, *Boiga irregularis*, encountered during our field work was also identified as a *soyñ*. This was on a hunting expedition in the Knej Valley, where it was disturbed from the thatch of a shelter at 800 m. Informants also use the term *soyñ* to describe small limbless creatures, multicoloured and with well-formed mouths and eyes, which they sometimes find in streams, and interpret as a transitional form between worms and eels (see 2.5): we have not examined any of these.<sup>(11)</sup>

*Soyñ* are said to eat frogs (which would be true of *Amphiesma*), worms and insects (true of *Toxicocalamus*). One informant said that they also ate the rotting foliage of mature taro plants. They are also said to swim well (this is certainly true of *Amphiesma*), and to be oviparous, depositing eggs underground. Four *Toxicocalamus* eggs were brought in to us on October 31, 1963, which had been dug out from a roadside at about

11. Bulmer 1968:629-30.

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1680 m. Two of these hatched 11 days later. While *soyy* are eaten only quite exceptionally, it is said that some Kalam and Kopon people do eat their eggs. *Amphiesma* is also a terrestrial egg-layer.

2.3.3 *Klyan* or *anmyp* are applied to the small arboreal Green Python, *Chondropython viridis*, which is seldom if ever found in the Upper Kaironk Valley, but appears to be not uncommon in forest, bush-fallow and overgrown gardens at altitudes below 1600 m. One specimen was obtained by us in 1960, and Jackson collected others in the Lower Kaironk Valley. Informants recognised that some *klyan* were yellow and others green, but were not aware that the difference was linked to age, juveniles being yellow. This python is said to eat orthoptera, beetles and the inflorescences of the cultivated cane, *Saccharum edule*. Our interpretation of this is that the snake is indeed sometimes found in cane which has damaged inflorescences, because it is preying on insects or other creatures which are feeding on the vegetable.

*Klyan* is regarded as edible, although many people at *Kaytog* and *Gobnem* have hereditary prohibitions on its consumption. The jaws, like those of some larger pythons, are retained for use as combs, and for the teeth to be used as probes to extract thorns.

Informants either contrast *klyan* with *soyy*, or refer to them as *soyy*, depending on context.

2.3.4 *Ymgwp* (term also applied to larvae of certain beetles, possibly Click-beetles, ELATERIDAE), *dmɲawt* (also the name of the totemic site, near Womk, which is associated with this creature) and *bedmeh* are said to be synonyms applied to a snake, which from descriptions appears to be an arboreal python larger than *klyan* (*Chondropython*). Like *klyan*, it may be either included in, or contrasted with, *soyy*; unlike *klyan*, *ymgwp* is generally considered to be a kind of *sataw* (2.3.7). It is said to be found at lower altitudes, but also, though very rarely, in bush-fallow and forest in the Upper Kaironk Valley at altitudes up to about 2,300 m. Accounts of its appearance were not consistent. One likened it in size to house timbers which were approximately 9 cm in diameter and up to 2 m in length. A group of generally knowledgeable men agreed that it could be as thick as our small billycan (12 cm in diameter) and the length of our front room (approximately 4 m). The same group said it was multicoloured on its back, with a yellow belly and "a tongue having many fingers". Kck of Klepn described how he encountered one in epiphytes in a forest tree on the south side of the upper Kaironk, and said it was dark green on top and white, definitely not yellow, on the under surface. Saem, who said that he inadvertently stepped over one while he was stalking a bird in bush-fallow in the Ced Valley at about 2,000 m in December 1972, described it as about 7 cm in diameter and a uniform dark brown on the back. He added that he couldn't see either the head or the tail, which were hidden in vegetation, or the under surface, and he was much too frightened to wait and inspect it more closely, once he realised what he had done, and ran away as fast as he could. Gi said he wasn't really sure what it looked like: he had heard it described as having a very big head and belly, brown on the upper surface and yellow below, but had also heard accounts

of colour patterns which corresponded to those in a photograph of a *Python boeleni* which was shown to him late in 1973, after the other discussions referred to above.

When C. J. Healey visited our Kaironk camp in December 1973, one of his assistants who came from a community near Tabibuga Government Station in the Jimi Valley gave a clear account of a snake which could only be *P. boeleni*, so it may be assumed that this species is present in the region: and records from other parts of New Guinea indicate that it could be encountered in oak forest up to 2300 m. However, Saem's description corresponds much better to that of *Liasis albertisi*, which Jackson collected in the lower Kaironk Valley, though the altitude at which Saem encountered it would be unusually high. Other descriptions correspond to *Python amethystinus* which has been recorded at altitudes up to 1700 m in other parts of New Guinea.

Accounts of the behaviour of *ymgwp* conflict as much as accounts of its appearance. Some say that it is not dangerous except to those who must respect it as a totem, and that those unrelated to it can eat it. However, most upper Kaironk people say that they are very frightened of it. Gi (in 1965) described it as dangerous. He said it sometimes hid in epiphytic ferns, sometimes made a nest on the ground, like a pig. He told two anecdotes about it, one concerning a man of *Kaytog* called Alapy who died in the late 1950s. Alapy chased a game mammal and thought it had hidden in an epiphytic fern, but when he poked a stick into this a big *ymgwp* emerged and chased him. Alapy went home and killed a large pig. Another unidentified man from the Jimi was said to have been killed by a *ymgwp* which bit him on the nose when he disturbed it in a tree. The man fell out of the tree, whereupon the snake followed him down to the ground and bit him again, on the genitals.

*Ymgwp* is said to have a deep resonant booming call, audible from one side of the valley to the other. While big pythons are known to break wind very noisily,<sup>(12)</sup> it is most implausible that a snake could be responsible for this sound. Imitations of it were reminiscent of the call of the European Bittern (*Botaurus stellaris*) and it is conceivable that one of the New Guinea bitterns (e.g. *Zonerodius* or *Dupetor*) which are encountered, though very rarely, in the Highlands<sup>(13)</sup> is responsible for this sound. However, it is also possible that the noise is human-produced, with the object of terrifying other people. The belief is that when this call is heard it means that a member of the totemic group associated with the *ymgwp* will die (see 3.1).

2.3.5 *Kawlam*, on the evidence both of Kalam descriptions, and from skeletal material we have examined, is also a taxon applied to one or more python species, and again like *klhan* and *ymgwp* this taxon is either included in, or contrasted with, *soyn*, depending on context: and like *ymgwp* it is also sometimes referred to as a kind of *sataw* (2.3.7). It is described as a large and relatively harmless snake found at lower altitudes. Some say it is the same as *nm* (? *Python amethystinus*-2.3.9), but others

12. Dr Alan Thorne, personal communication.

13. Diamond 1972:99-100.

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say that it does not grow as large as *nm* and also contrasts with this in that *nm* is variegated in its markings, with some bright colours, while *kawlam* is uniformly dark-coloured. Gi, who takes the latter view, says that it grows to not much more than 2 m in length, is terrestrial, favouring damp grasslands, and has a blunt snout, like an eel's. He says it is found in waterside grass as high up as Watabung (Blm ford) on the Kaironk River at approximately 1500 m, and by the Mbdl River below Womk to about the same altitude.

Some Kopon people use the vertebrae of this snake as an ornament. A set which we were offered for sale suggested that the living animal would have been near to 3 m in length.

2.3.6 *Koyn* is described as a large but harmless kind of *soyn* found at lower altitudes in the Jimi and Asai Valleys, eaten by the inhabitants of those areas, and by some upper Kaironk men when they visit them. Most of our informants professed ignorance of this creature. Mowñ of Kaironk said it was arboreal, living in the foliage of *Ficus dammaropsis*, that it was dark and mottled like a gecko, and had sharp teeth, four on each side of its jaw. This description appears to correspond with juvenile *P. amethystinus*.

2.3.7 *Sataw* is applied to taxa at three levels: (i) to a particular kind of venomous snake which Kalam variously describe in terms which suggest that some have the Death Adder (*Acanthophis antarcticus*) and some the Small-eyed Snake (*Micropechis ikaheka*) in mind; (ii) as a generic category for snakes which Kalam believe to be venomous or otherwise highly dangerous; (iii) to any strange and terrifying reptile, limbless or limbed.

Our view that one primary reference is to the Death Adder rests on many informants' statements that the "true" *sataw* is a grassland snake that can kill both men and pigs; their belief that it stings with its tail, a widespread misconception about the death adder held by many New Guineans and by some white Australians, based presumably on observation of the pointed horny tip to the snake's tail, which it twitches to lure prey;<sup>(14)</sup> and their statements that the transverse bands on the back of the skink *ñgñolom* (*Sphenomorphus leptofasciatus*—2.1.9) are like the markings on the *sataw*. However, descriptions of *kodkl* (2.3.8) suggest that this term is also applied to the Death Adder; while some accounts of *sataw* encountered in forest or garden vegetation are more suggestive of the other medium-sized and venomous snake known in lowerlying country adjacent to the Upper Kaironk Valley, the Small-eyed Snake. Though of quite a different shape and general colour pattern from the Death Adder, some individual Small-eyed Snakes show pronounced banding. One of Gi's stories is about a man of the Knej Valley who, while clearing a garden, disturbed a *sataw* with eggs (the Death Adder is viviparous) in trash at the base of a banana palm. The snake bit him in the leg, which swelled up, and the man died the next day.

Gi also described an incident which happened to a party of hunters from Gobnem, which included himself, on a visit to the Knej Valley in 1962. One day they killed a goanna. That night they slept in a house with

14. Worrell 1963:109.

two rooms, the women in one and the men and boys in the other. The women called out that they could smell a *sataw*, so they should watch out. Later, when all the others were asleep, the boy Tawtc, then aged about 10, went to blow up the embers of the fire and saw two *sataw* come through a small hole, like a rat-hole, in the wall. The two snakes were twined together and they slithered over the legs of Gtkep, Tawtc's father. Tawtc woke his father, who shook the snakes off, and chopped them in two. Later they buried them. Although Gtkep was not bitten by the snakes, on the following day he became sick. The others helped him walk as far as Wyjl, where they slept that night, and on the next day they carried him on a litter to the head of the Sal Valley, where he died. He was taken back to Gobnem for burial. Gtkep's wife came from the head of the Sal. The Gobnem men were angry with her because she had always been quarrelling with her husband, so they returned to her kinsmen's house there, where Gtkep had died, and burnt it down. Death was attributed to witches (*koyb*) appearing as *sataw*.

In a third story about *sataw* in the Knej Valley, Gi also alludes to the odour these exude, which, he says, distinguishes them from other snakes.<sup>(15)</sup> A relative of Gi's called Wlskajen noticed this smell in his house. A very big snake appeared through the eaves. The man killed it, took it outside and buried it. This account suggests that the *sataw* concerned was a python.

There is at least one very large non-venomous snake, the Amethystine Python (*Python amethystinus*), in the Lower Kaironk Valley and adjacent areas, which it would be proper to treat with caution and respect. Kalam refer to very large snakes as *nm* (2.3.9) or *sataw*. The taxa *ymgwp* and *kawlam*, already discussed, and *kodkl*, *jjoj* and *pak*, to be discussed below, are also considered to be kinds of *sataw*.

An even wider extension of the referents of *sataw* was indicated by Gi and Kiyas when they visited zoos in Australia and New Zealand in 1965. They spontaneously identified crocodiles, chameleons and snake-neck turtles as this.

The concept of *sataw* has an importance in Kalam cosmology comparable to those of "serpent" and "dragon" in earlier European world-views: it is discussed further in 3.1, 3.2 and 3.3.

2.3.8 *Kodkl* is described as living in the grasslands and "short and thick, like a fish, but with no limbs; with dappled markings; and killing men by jumping up to strike them". This suggests the Death Adder, though, as with other snakes, the Death Adder does not, in fact, leap up.

2.3.9 *Nm* is described as a huge multicoloured snake, and, allowing for exaggeration in informants' accounts, would appear to correspond to the adult Amethystine Python, *Python amethystinus*, which is known to attain over 8 m in length, and preys on pigs and wallabies. Pyaw, former Luluai of Kaytog, said that of the two he had seen, one would have stretched from the hearth where we were sitting to our latrine hut, a distance of over 15 m; the other, which he saw at a landslide in Wyaw territory,

15. Most snakes exude a foul smell when disturbed. Of those recorded in the Kaironk region, *Stegonotus* makes a particularly objectionable one.

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i.e. in the Wulamer Valley region to the west of the Kaironk, was much smaller, only 6–7 m. Wñ and Gi said that big *nm* were as thick as a 4 gallon kerosene drum.

According to Pyaw and Mosak, *nm* feeds mainly on pigs, though it also takes men. Typically, it is believed, it either ambushes its prey from a place of concealment; or it takes it at night, by invading its sleeping quarters. It coils itself around the victim and both crushes it and simultaneously inserts its tail into the victim's guts, through its rectum.<sup>(16)</sup> It then leaves the dead though still externally intact creature, and repairs to a nearby stream or pool, where it fills itself with water. It returns to disgorge the water over the prey, to make it wet and slippery. Then it swallows it. Digestion then takes a long period, a month or even two months, during which time the snake remains in the same place. Finally it defecates, and then starts wandering about again.

Pyaw also described how a *nm* which came at night to take a pig at a homestead at Kalgy-pk, a place on Sawey hill (to the south of the Kaironk Valley) was killed by the men there. However, on the following morning no one there was prepared to eat it, so a woman called Tbtik from near Blm was called to come and collect it. She carried it home in her net bag, and her husband gathered leaves and bananas, which they cooked with it in the earth-oven. It was only a young snake with a diameter similar to that of the anthropologists' small billy-can (about 12 cm). One of Pyaw's brothers ate some of it, swelled up, and was sent to Tabibuga hospital, but he died on the road. He was buried by some Maring men who then claimed compensation from Pyaw, but he refused this, saying that they had killed the man.

2.3.10 *Pak* (a homonym applies to a pit-trap with concealed sharpened stakes in it) is another snake of lower lying areas, considered to be a kind of *sataw*. Gi compared the size of one he had seen in the Knej Valley to the gable pole of our house, which was approximately 7.5 cm in diameter and 4 m long.

2.3.11 *Jjoj* is another lower-altitude snake for which we have conflicting descriptions. One account was that it was found in grasslands and squirted poison from its tail into the eyes of its victims. However, two other statements describe it as an arboreal snake present up to at least 1400 m, not unlike the local *soyñ* in appearance but growing somewhat longer, with a reddish belly, and feeding on young birds and eggs. This suggests strongly that the speakers had the Tree-snake, *Boiga irregularis*, in mind, though the only *Boiga* we encountered was identified as a *soyñ*. It was said to bite, but we were not told of serious injuries or deaths resulting from its bite. It is also said to come and suck milk from women's breasts while they sleep, and to have a whistling call, "Tl np wy" ("breast her here", which may be rendered, "Come quickly to the breast I've found").

2.3.12 *Alogow* was a name supplied, without further information, for a kind of arboreal snake.

16. Charles and Nicole Macdonald of Paris, who have worked on Palawan in the Philippines, inform us that they recorded a similar belief in that area about the python's use of its tail in killing its prey.

#### 2.4 *Taxa applied to crocodiles and turtles*

Crocodiles and turtles must be known at first hand by members of Kalam groups dwelling near the Ramu lowlands, but none of our informants in the upper Kaironk Valley had ever seen these creatures before Australian Administration made it possible for many of them to travel to other parts of Papua New Guinea. The term *kpy* appears to be the traditional term for "crocodile", though when we were first given this in the early 1960s as the name of large man-eating creatures living in the Ramu River, descriptions were so imprecise that for some time we were uncertain if crocodiles or sharks were being referred to. Crocodiles and alligators, seen for the first time by Gi and Kiyas in Sydney and Auckland zoos, were identified as *sataw*, not *kpy*. However, Kalam possess crocodile teeth, which are kept very secretly and used in initiation ritual and in male love magic, and these are sometimes referred to as *kpy meg* "kpy tooth". However, they are also known as *nkn* or *nkn-yb-kb*, terms also used for what Gi describes as a roaring whirlwind in the country to the north, "with an exploding sound heard everywhere", and the teeth are in some way identified with this and believed to have their origin in it and, apparently, not to come from any living natural animal.

Kaironk men who have in recent years seen marine and freshwater turtles in other parts of Papua New Guinea say that they believe there is a Kalam term for freshwater turtles, but with one exception they could not remember this, nor could any of the old men we consulted. Sawan said that the authentic Kalam term was *yejw*.

#### 2.5 *Taxa applied to eels*

Kalam have three terms for eels, *woknəŋ*, *asnəŋ* and *tok*. *Woknəŋ* is the ordinary everyday term for the smaller eels found in local waters, but can be used in an extended sense to apply to any or all eels. *Asnəŋ* are very large eels, normally found only in lower altitude rivers, but occasionally encountered in the Upper Kaironk. *Tok* is the word-substitute synonym for both *woknəŋ* and *asnəŋ*.

Though Kalam believe that eels develop from *yabol* "earthworms" or from certain small *soyŋ* snakes which have themselves developed from earthworms,<sup>(17)</sup> they note that eels contrast with snakes (*ŋom*, *soyŋ*) in their general conformation, presence of fins (*koŋs* "dorsal fin", *tmd* "ear", "pectoral fin"), sliminess, voice (*mokop* "belch"), and essentially aquatic nature, though they describe eels as sometimes leaving the water and hunting for frogs in marshy areas near to streams. Eels are highly valued for food, and for ritual cooking.<sup>(18)</sup> They are caught in the wicker traps with spring-released doors which are used in most of the interior of New Guinea. These are baited with frogs or *kəny* (Coleopterous larvae). Nowadays, metal hooks and lines are also used. Eels are carried and kept, until the time comes to cook them, either in the smaller of the wicker traps in which they are caught, or in cylindrical containers of wicker and bark which can be left in the water to keep the eels alive.

17. c.f. Bulmer 1968.

18. Bulmer n.d. (i).

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2.5.1 *Asnay* are very large eels, said to grow as thick as a man's thigh, with dark mottled markings, found mainly in rivers at lower altitudes but occasionally in the Upper Kaironk. Allowing for some exaggeration, this taxon may correspond to *Anguilla marmorata*.

2.5.2 *Woknay* include both the smaller eels, *Anguilla interioris*, which are the usual kind caught in the Upper Kaironk River and its tributaries, and the very special and rare kind *woknay mokal-wt* (2.5.3). They contrast with *asnay* in their smaller size and more uniform coloration.

2.5.3 *Woknay mokal-wt* (*mokal* is a small aroid plant, ?*Aglaonema* sp., cultivated for use in pig and wealth ritual; *wt* is a bunch or cluster) contrast with ordinary *woknay* in their possession of extended green adhesions at each side, behind the head, which are likened to the spatulate foliage of the *mokal* plant. They are said not to grow particularly large, not more than 2 or 3 feet in length. These creatures are, if caught, treated with the greatest respect and immediately returned to the water, being identified with particular deceased ancestors. But in any case very few are caught. We can only speculate as to whether this is a hitherto undescribed form of eel, an unidentified eel-like fish, or an eel with some kind of parasitic or fungoid growth attached to the gills.<sup>(19)</sup>

### 2.6 *Taxa applied to fishes other than eels*

*Kobsal* is the generic term for fishes other than eels (and ? eel-like creatures).

We have neither seen, nor had described to us, any "typical" fish from the upper Kaironk River area.

2.6.1 *Kobsal gs* ("brown" or "dull-coloured" *kobsal*) are said to be one kind found in rivers at lower altitudes.

2.6.2 *Kobsal dsn-bad-sek* "*kobsal* beard-possessing" are also found in the Jimi and the lower reaches of its tributaries. These must be catfish (PLOTOSIDAE or TACHYSURIDAE). Pawley<sup>(20)</sup> recorded the term *sac* as possibly also applied to catfish.

2.6.3 *Pys* (from English "fish" through Pidgin "pis") is applied both to tinned fish, especially the "mackerel" and "mackerel-pike", which has become a familiar feature of Kalam diet in the past decade; and to the *Tilapia*, introduced by Administration in 1965, which are very ineffectively farmed in a number of small artificial fish ponds in the Upper Kaironk Valley.

The recent equation of *pys* with eel in the system of dietary prohibitions has already been mentioned (2.0 above).

### 2.7 *Taxa applied to creatures related by Kalam to reptiles or fish*

Kalam do not include any invertebrates in the taxa they apply to reptiles and fishes. Nevertheless, there are two groups of invertebrates which they regard as in different ways closely related to *yñ*, *soyñ* and *woknay*. These are centipedes and earthworms. Both will be discussed at greater length in a future publication devoted to Kalam classification of invertebrates.

19. c.f. Bulmer 1968:632-3.

20. Pawley, Bulmer & Biggs 1970-74:481.

2.7.1 *Kodal* are centipedes (Chilopoda), though the term is also sometimes used for earwigs (Dermaptera). If asked what creature that is not a *yñ* is most like a *yñ*, Kalam normally refer to *kodal*. A large and locally quite common centipede species grows to about 20 cm in length, so is of comparable size to the skinks, and like some of them is found on the ground, under decaying vegetation and logs. It is said to inflict an unpleasant bite which can cause a considerable swelling. Nevertheless, while Kalam treat it with some caution, they show none of the exaggerated distaste and fear for this creature which they show for two of the quite harmless local small lizards, *Sphenomorphus leptofasciatus* and *Lepidodactylus* sp.

Kalam see a further relationship between centipedes and scorpions, calling the latter *kodal nop* "father of the centipedes", though the name is figurative and does not indicate that they believe that there is a biological relationship involved. They treat scorpions also with a little caution, but in a totally matter-of-fact way. They say that scorpions, which they find under stones in damp areas of garden-fallow, feed on skink eggs.

2.7.2 *Yabol* are earthworms, which are likened to *soyñ* snakes and believed in some cases to grow into *soyñ* snakes and *woknay* eels.<sup>(21)</sup> Big earthworms (*gwldak* or *yabol gwldak*) found in forest and bush-fallow are in some cases considerably larger than newly hatched *Toxicocalamus* snakes, and the dark steely-blue-grey forms, for example *Pheretima bulmeri*<sup>(22)</sup> are indeed very snake-like in appearance. Kalam regard earthworms with considerable revulsion, as already reported in some detail.<sup>(23)</sup>

## 2.8 *Kalam classification of reptiles compared with their classification of other vertebrates*

With a few notable exceptions (pigs, dogs, cassowaries and house-yard rats), all mammals, birds and frogs known to Kalam can be placed in one or other of three well-defined taxonomic hierarchies: *yakt* "flying birds and bats"; *kmn* "game mammals" or "larger furred mammals"; and *as* "frogs and small furred mammals other than house-yard rats". Each of these hierarchies includes up to three levels of internal differentiation.<sup>(24)</sup> While Kalam also classify these creatures in many different and crosscutting ways, there can be no doubt about the functional and cognitive saliency of these three taxonomic hierarchies. This is evident from everyday linguistic usage. All uninomial taxa applied to these furred animals, flying birds and frogs, which correspond, in a logical sense, either to "species" or to "genera",<sup>(25)</sup> may optionally include one or other of the terms *yakt*, *kmn* or *as* in their names. Thus, a Mountain Pigeon (*Gymnophaps albertisi*) may be referred to as either *malg* or *yakt malg*, in rather the same way as breeds of cattle may be referred to in English either as "Jerseys", "Herefords", "Shorthorns" etc., or as "Jersey Cattle", "Hereford Cattle" and so on.

21. Bulmer 1968.

22. Gates 1970.

23. Bulmer, *op. cit.*

24. Bulmer 1967; Bulmer & Tyler 1968; Bulmer & Menzies 1972/73.

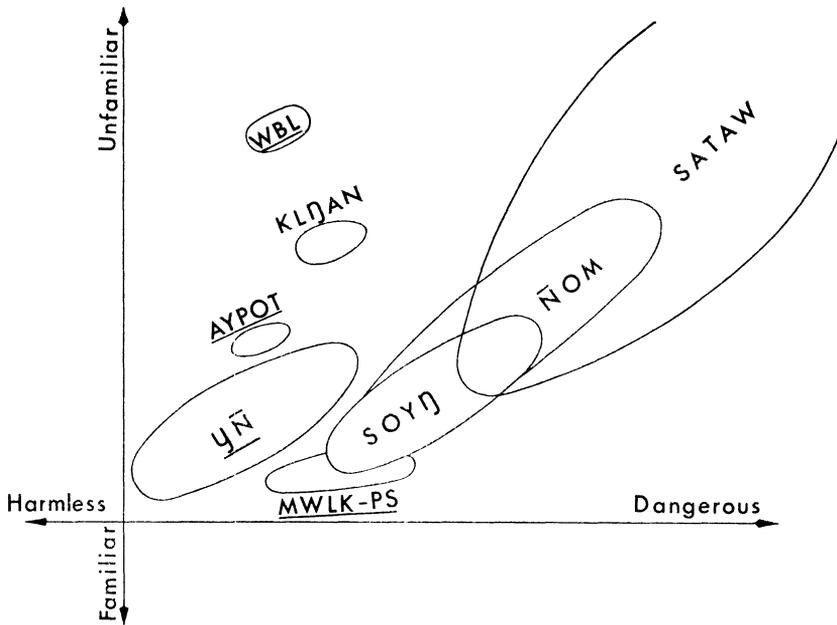
25. Bulmer 1970, 1974.

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In contrast, Kalam taxa applied to reptiles can only in a limited and much less salient sense be seen as constituting a single taxonomic hierarchy. Kalam agree that as any kind of reptile may be referred to either as a *yñ yb* ("true" *yñ*) or, if not a *yñ yb*, as a *yñ ladjk* ("wild", "useless" or "abnormal" *yñ*), then it follows that in the widest sense all reptiles are *yñ*. Yet the only species- or genus-like taxa with names which may include *yñ* are those applied to skinks; and a composite hierarchy, as presented in Figure A, both has to include a series of covert or near-covert categories with identical designations (*yñ yb* vs. *yñ ladjk*), and is arbitrary in its placement of certain taxa, notably those applied to the less-familiar lizards and to those snakes that can be regarded as either *soyñ* or *sataw*. Thus, it is probably truer to Kalam thought to see their reptile categories as arranged in a constellation of small taxonomic hierarchies and monotypic taxa arranged between the polar values *yñ yb* ("true" *yñ* in the most restrictive sense, i.e. the most familiar and innocuous small skinks) and *sataw*, the most unfamiliar, mysterious and dangerous of reptiles. In such an arrangement, skinks and other lizards spread from the totally harmless and familiar pole through well into the dangerous zone, while *soyñ* and *nom* snakes fall well towards the dangerous end of the continuum (see Figure C).

The lack of clarity in Kalam reptile taxonomy reflects in part the lack of familiarity of Kalam with many of the species present within a day or so's walk of their territory, and also the objective problems which arise

FIGURE C: KALAM REPTILE TAXA PLOTTED IN TERMS OF FAMILIARITY AND OF ATTRIBUTED DANGEROUSNESS



Note: Names for taxa applied to lizards are underlined.

in identifying many New Guinea snakes and lizards on account of their changing colour patterns at different stages of maturity and, in certain species, sexual dimorphism and polymorphic variation. It also reflects the combination of interest and fear that they show towards these creatures, which is manifested in the hasty and distorted observations that they make of them, and in the exaggerations and contradictions which embellish oral traditions about them.

### 3. MYSTICAL ASSOCIATIONS OF REPTILES

For the Upper Kaironk Kalam two reptiles are totemic animals. Snakes in the *soyn* and *sataw* categories are associated with witchcraft. Two common and familiar small lizards are also singled out by Kalam for special attitudes of fear and disdain, and there are special ritual observances associated with one of these.

#### 3.1 Totemic reptiles

Different and overlapping groups of Kalam resident in the upper Kaironk Valley variously respect seven kinds of plants and six kinds of animals on the basis of hereditary associations deriving from mythical events in distant ancestral times (Bulmer n.d. (ii)). These are referred to as *cp* ("spirit") or, in relation to persons respecting them, as *tap ayp* "something it develops". The animals are the *ymgwp* or *dmɲawt* python (?*Python boeleni*—2.3.4); *aypot* or *kwom*, the dragon-lizard (*Goniocephalus nigrigularis*—2.2.2); the striped possum, *Dactylonax palpator*; the fruit-bat *Dobsonia mollucensis*; the sooty owl *Tyto tenebricosa*; and *akpt*, the large ranid frog, *Rana grisea*. Of these the python is particularly important, at least to the people of Kaironk and Womuk census villages, among whom we have worked, being more feared than any other totem. Any manifestation of this snake, whether by being seen or by its alleged booming call being heard (see 2.3.4 above) is supposed to presage a death among the men of the associated descent group. In terms of our present information, the python is also unique among the totems in that it is believed to be the physical progenitor of the group concerned, whose first human ancestor hatched out of a python's egg. It is associated with a site called *Dmɲawt* or *Dmɲawt-komeɲ*, an acre or less of tall trees and bushes surviving among the grasslands and gardens on the western side of the ridge-top road from Womuk Rest House to Wañlek and Watabung. It is said that until fairly recent times, but not within living memory, pigs and game mammals were ritually cooked at this site.

Each totemic species is associated with particular physical afflictions which are believed to strike a human member of its group who fails to respect the totem (i.e. by killing or eating it in the case of the animals) or who seriously offends a close relative who shares the same totem. In the case of *ymgwp* the prohibition on eating extends to all other snakes, including *klyan*, the small Green Python, and *kawlam*, a larger python, which are eaten by many Kopon and some Kalam people. The afflictions associated with *ymgwp* are boils, carbuncles and other swellings: Gi

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ascribed a bad whitlow on his thumb to a quarrel with his father which had invoked totemic intervention.

The site associated with the *aypot* dragon-lizard is Wayak-tam (Wayak-fork), a place by the Wayak stream not far from Kaironk School; and the affliction associated with this totem is a skin disease affecting mainly the back, "disfiguring it like the back of the lizard". The lizard totem seems not to be taken as seriously as the python: we were told of youths secretly and experimentally eating the lizard to see if anything would happen to them: though one young man who is supposed to respect it also described how he drew his bow to shoot one on one occasion, and instead of fleeing it ran straight at him, which he found disconcerting and frightening.

Recent events in Kaironk and Womuk census villages indicate that totemic affiliation and threats or fears of mystical action by the totem have continuing significance in local politics. S. E. Bulmer's archaeological excavations at Wañlek in 1972 and 1973 provoked grumbling from various groups who, generally with little understanding of the nature of the operation or of the arrangements negotiated with present *de facto* owners of the site, claimed that they should have been compensated as the "true" owners of the land, and their kinsmen have been given preference in the recruitment of labour. Claims to the land, in some cases by men who did not argue that their direct ancestors had used it for several generations, were made on the basis of hereditary association with the nearby Dmṅawt-komeṅ totemic site. Concurrently one of the claimants to Wañlek, allegedly in the direct agnatic line of descent from the python, revived the story that the snake was present in the oak trees and canegrass at Ccpen, very near Gobnem. Wpc, the Big Man of Gobnem, who also respects this totem, but on account of a genealogical connection through his mother, was sceptical, saying that if a giant rat is in a certain tree, one sees that foliage near by is broken, and one finds the droppings of the animal—in other words, he had seen no evidence of the snake. Our inference was that the assertion was part of an ongoing challenge to the big-man's dominance in the Gobnem area, and an attempt by the challenger to reinforce his own social position and land claims both at Gobnem and at Wañlek by reminding the community at large of the mystic power of his totemic ancestor.

### 3.2 *Snakes and witchcraft*

Kalam believe that certain men and women, who may be referred to as *koyb* or as *b/byn koyb-sek* "man/woman witchcraft-possessing", have the power to kill others in mysterious and unpleasant ways, feed on the corpses of those they kill, and can also manifest themselves as certain kinds of animals or have certain kinds of animals as their associates.<sup>(26)</sup> Most deaths of adults in the prime of life, and especially deaths following only a brief period of sickness, are attributed to *koyb*. While almost any creature encountered in an unexpected place or behaving in an uncharacteristic way may be identified as *koyb*, (examples recorded include pigs, dogs, cassowaries, marsupials, hawks) the five taxa which are most

26. Riebe (1974, Ch. 13) also discusses Kalam witchcraft beliefs at some length.

closely associated with witchcraft are two small black-and-white water-side birds, *jigayan* and *kotleg* (*Pomareopsis bruijni*, the magpie-lark, and *Monachella mulleriana*, the river-fly catcher), *nay* (the wild duck, *Salvadorina waigiensis*) and the snakes *soyn* and *sataw*.

The power of a witch, in Kalam belief, lies in an animate entity called *koyb n̄lk* "witchcraft young" (the term *n̄lk* is used of the young of any kind of animal, but not of man) which the witch voluntarily or involuntarily harbours in his or her body. In the case of a man the witchcraft-young have the form of little snakes or worms. The witch may keep these hidden in secretly cultivated ginger or *Commelina* plants, and is said to take them into his body through his nose when he wants to perform as a witch. When he does not have the witchcraft-young inside him his powers are not different from those of other men. It is possible for a man accidentally and unwittingly to ingest witchcraft-young, and if he does so he then behaves like a witch in killing people, but in a crazy random sort of way, not with the conscious control that a "real" witch exercises. It is not clear to us how witches are supposed to divest themselves of the witchcraft-young when they do not wish to exercise their powers, or how precisely the witchcraft-young are transmitted from individual to individual or generation to generation. But it is said that until very recently male witchcraft was only inherited patrilineally; now some men are believed to purchase it with shell valuables and pigs.

For female witches the witchcraft-young is a fluffy thing, described as "like a duckling" or "like the chick of the *kotleg* (water-flycatcher)" which can enter the body through the vagina. A woman who has homosexual relations with a witch can herself involuntarily become one through genital transfer. However it is also said that female witchcraft is transmitted from mother to daughter, the daughter accompanying her mother to feast on corpses of victims, and as a consequence of this action herself becoming a witch.

Witches are spoken of both as manifesting themselves as *sataw* or *soyn* snakes, and as sending these snakes out on their behalf, for example to wriggle through the fences and around surface-burials to tear flesh from a corpse and bring it back to them. Witches are also said to reappear as *sataw* after death.

Though witches are believed to move about in animal form, or in disguised human form, they recover their normal human shape before they actually attack people. What they are then believed to do appears to be important to an understanding of the identification of witch with serpent. Witches are thought to ambush their victims and either to stun them with a blow which leaves no external mark, or in some other way to render them unconscious. It is said that in some cases witches are accompanied by accomplices who do not themselves have witchcraft powers, but whom the witch can render invisible, and these stun the victim. Having done this, the witch removes vital organs and, in some cases, inserts foreign bodies such as stones or mushrooms in their stead. But no blood is shed in this process, and the victim is sewn or sealed together again so that no obvious wound is afterwards detectable.

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The victim recovers consciousness and returns home, though to varying degrees amnesiac. In some cases he may have a confused recollection of what happened to him, as though of a nightmare. Within a short period, ranging from a few hours to two or three days, he or she dies.

Kalam disposal of the dead involved, until Australian Administration was established, leaving the corpse to decompose either on the ground surface, or on a raised platform, with a fence built round to prevent disturbance by pigs and dogs. At night the witches come to eat the corpse.

The identification of witches with serpents may plausibly be related to the analogies between the behaviour of snakes, as Kalam see this, and the behaviour which Kalam attributes to witches. Underlying these analogies is the fact that snakes, taken collectively, eat the same animals that men eat—pigs, wallabies, bandicoots, and other marsupials and rodents, the odd bird (especially young birds), and so on right down to frogs and insects. (They also eat each other, though we have not had this reported by Kalam.) They are the only raptors in New Guinea which parallel man so precisely in their range of prey. There is a further parallel, if one wishes to pursue it, in that different kinds and sizes of snakes select different categories of prey, just as different categories and statuses of men select differently from the total range of animal foods available to them.

Perhaps more importantly, snakes are unique among the fauna known to Kalam in that they can kill men and are also believed by Kalam to eat men. Men of course also kill each other, but the only men who eat each other men are witches. But the analogies between snake and witch go further than this. Firstly, snakes dwell in places of concealment, in holes in the ground, under rocks or tree-trunks, or under foliage. If partially exposed they are often cryptically coloured, so that they are only detected at close quarters. Thus there is almost always an element of surprise in an encounter with a snake, as there is also in an encounter with a witch.

Secondly, snakes appear often to terrify their prey. Some animals give the impression that they are paralysed with fear, though biologists generally dispute this interpretation. At other times an animal may appear to be mesmerised by the movements of the snake's head or tail or tongue. In these respects a snake's actions parallel those of the witch and his accomplices who mysteriously intercept and detain their victim.

Thirdly, most snakes more positively immobilise their prey, before fully ingesting it. Pythons and related species do this by entwining and crushing (or, more accurately, suffocating) it. The species properly regarded by human beings as venomous kill or stun their prey with venom before swallowing it. One group of snakes, which includes a species (the tree-snake, *Boiga irregularis*) common at altitudes just below those occupied by Kalam, have venomous fangs placed at the rear of their jaws and constructed in such a way that they cannot normally damage man or any other large animal, but they use these on the smaller creatures that they can seize, thus immobilising them to facilitate ingestion. With some other species which take creatures considerably smaller than them-

selves, damage inflicted by the snake's jaws, suffocation in its mouth or gullet, and the toxic properties of its saliva, may be sufficient to immobilise the prey. While Kalam are not aware of all these technicalities, they know well that some snakes have a venomous bite, and that others crush their prey; and that, by whatever techniques, snakes render their prey immobile and ingest it whole, neither dismembering it nor spilling significant quantities of blood, nor significantly damaging its exterior surface. In this snakes contrast with avian and mammalian carnivores, which even if they swallow their prey whole, often lacerate or partially dismember it in the process of capture and killing. Killing by snakes also contrasts with "normal" human homicide, as known to Kalam. This involves the use of sharp weapons and, inevitably, the shedding of blood. If possible, indeed, it often involves extensive mutilation and even dismemberment of the corpse, so that bloodshed is very extensive. Witches, however, are like snakes and unlike normal human homicides: they kill without shedding blood and without leaving visible damage on the exterior of the body, and do not mutilate until long after the victim has died.

The prolonged sequence of actions involved in killing and consumption provides another analogy between witch and snake. Kalam believe that giant snakes (*nm*, in the *sataw* group) leave their prey when they have killed it, and go to water, which they drink copiously, and then return and expel this over the victim, to facilitate swallowing. Presumably they here misinterpret cases of snakes disgorging saliva-covered prey when disturbed, though it is possible that observation of snakes drinking may also contribute to this belief.<sup>(27)</sup> Another way in which snakes differ from other raptors is, as Kalam correctly believe, in the prolonged and slow process of their digestion, though our informants exaggerate the time involved. They describe this as a process of "stinking" or "foetid decomposition" in the stomach. Witchcraft killing, unlike normal homicide, also consists of two separated stages of aggressive acts, the rendering insensible and removal of vital organs, and the following home and consumption, the latter at a stage when the corpse is laid out in burial to decompose or "stink".

In these respects then, witchcraft killing resembles the actions that the Kalam, partly correctly and partly incorrectly, attribute to serpents. We must stress that no Kalam has pointed out these parallels to us: but it would seem unlikely that the similarities are accidental.

### 3.3 *Serpents in 1962 Cargo Cult prophecies*

On February 4, 1962, a total eclipse of the sun was visible in much of north-eastern New Guinea. Advance publicity from the Administration triggered off an innovative cult movement in the whole region of the Kalam and their neighbours, which in broad outline resembled an earlier movement in 1957 and a later one in 1965-66. However, *sataw* serpents figured prominently in the beliefs associated with the 1961-62 movement, whereas we have no evidence for these in the earlier or later outbreaks.

27. Pope 1961:92, 105-6.

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In the Kaironk Valley late in 1961 the prophecies, allegedly originating from a young man called Kobseb from Payjel in the northern Schraders, were that a great darkness, caused by a rain of ashes, would descend for two months, that it would be accompanied by earthquakes and floods, and that the ancestors would return from the underworld, either in the form of *sataw*, or preceded by *sataw* which were dead witches. Every kin group in the Upper Kaironk Valley built special houses for their protection during these cataclysmic events. The two most important features of these houses were that they had walls and roofs which, unlike those in normal Kalam houses, should let in no chink of light; and that platforms or raised living-floors were built, again unlike the conditions in most Kalam houses, where people sit and sleep on the ground-surface. Vegetables were stockpiled inside the houses, and pigs were to be brought inside. Pigs were not to be killed before the darkness began, or indeed during it unless and until all other food was exhausted, as their blood on the ground would displease the returning ancestors.

Some said that the ancestors would return in human form, but with white skins (the dead are conceived by Kalam to be white-skinned, and Europeans were during the early years of contact identified with the dead). But there was also the general belief that great serpents would come and, in retrospect, it is said by some that these were thought to be the ancestors, by others that they were thought to be witches coming in advance of the ancestors. The building of raised floors was specifically a protection against the serpents (there are references in folk tales to men constructing beds raised off the ground in their houses or hunting shelters, as a precaution against serpents). However, it was also said that if serpents entered the houses men were to sit quite still and let the serpents crawl over them. If they could do this they would be the recipients of the wealth which the ancestors would bring and leave for them, as part of the general millenarian benefits they would enjoy.

Needless to say, the eclipse came and went rapidly, and there was no evidence reported in the Upper Kaironk Valley for the return of ancestors, with or without serpents. And we recorded no talk of serpents in the later, 1965–66, movement.

This interlude presents what appears to have been a temporary convergence of the identification of *sataw* as the totemic ancestor and their identification with witches. This may possibly have deeper roots in Kalam belief than we have been able to explore.

### 3.4 *Serpents and lizards in the gardens*

The most feared reptiles are the least familiar. Nevertheless, two common and familiar small lizards, *ngñolom* (the Banded Skink, *Sphenomorphus leptofasciatus*) and *wowy* (the Gecko, *Lepidodactylus* sp.) are treated with disdain and aversion, and some measure of fear. In the case of the Banded Skink, Kalam are loath to touch this creature, alive or dead, and would never consider eating it. They say firstly that this is because it is like a *sataw* in appearance; and indeed both in its markings and in its conformation it bears a resemblance to a young Death Adder.

Secondly, some informants have also mentioned that they are frightened of it because it quivers when discovered (see 2.1.9).

Thus the special status of the Banded Skink can be interpreted in the light of Douglas's and Tambiah's propositions about "anomalous animals", and specifically in terms of Tambiah's third proposition that, "An animal that is placed in a class because it shares certain dominant properties of that class may yet be seen as exceptional or anomalous and therefore ambiguous as food or inedible (even if other members of its class are edible) if it shares one or more characteristics with animals or another class which carries strong values and is considered inedible".<sup>(28)</sup>

However, there is more to the status of the Banded Skink than this. It is most often found during garden-clearing, or when taro is being weeded or harvested, sometimes actually in decomposing taro foliage. Informants' accounts differ on what they do when they find it. Some say that it should be removed from the garden and not killed, but flicked out with the end of a stick, or picked up and carried away in a split stick. Others say that it is important that it should be killed, and that its corpse should stay in the garden; or, if this is not possible, at least its tail, if shed, should remain there, because the tail absorbs the shadow-soul of the taro. Yet others say that though it should be killed or removed if found during garden-clearing, if discovered among growing taro it should be left there.

The association of this lizard with taro, the most valued Kalam ceremonial crop<sup>(29)</sup> is thus also part of the explanation for the special ritual attitude which Kalam show for it. In a sense, the Banded Skink is the *sataw*'s representative in the taro garden. The *sataw*'s name must not be spoken in a taro garden or the crop will be damaged. The *sataw* itself is most unlikely to be found there, though *soyy* snakes occasionally are, and, like Banded Skinks, are said sometimes to be found in decaying taro foliage.

### 3.5 *The gecko: familiarity breeds contempt*

Kalam attitudes to the gecko, *Lepidodactylus*, for which we have recorded seven different names or nicknames (2.2.1), are qualitatively different from those they demonstrate towards the Banded Skink. They do not eat it, but in this case rationalise their avoidance by saying that it is plainly inedible, a status it shares with only one other category of vertebrate animals, the *gwnm* toads (certain microhylid frogs) which Kalam say are poisonous. And we have failed to obtain any statement of ritual observances or rationalisations for the very real fear and disgust which the creature evokes. When specimens are captured, people react much more strongly, with gestures and grimaces of revulsion, than they do to Banded Skinks in the same circumstances. But the only "objective" reason Kalam have given us for the fear in which they hold this animal is that, if disturbed, for example by someone cutting bananas or banana foliage, it may jump out into one's face and cling on, scratching with its claws.

Careful direct observation of Kalam encounters with geckos, and

28. Tambiah 1969:451. See also Douglas 1966, especially Ch. 3.

29. Bulmer 1967.

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experimental manipulation of these, might reveal what precisely it is that Kalam find so repulsive about the gecko. In this instance, Tambiah's first and third propositions<sup>(30)</sup> may both be argued to apply in part, though not so clearly as in the case of the Banded Skink. Thus while we can say with assurance that part of the reason for the special treatment of the Banded Skink is that it is seen, explicitly, as related to the serpents, this would appear to be true only in a vaguer and less overt way in the case of the gecko.

However, there is another way in which the gecko is singular. Although it is by no means the commonest reptile found in and around human settlements, it is the only one that appears to occur exclusively in these contexts, in the thatch of abandoned houses, and in bananas, casuarinas, eucalyptus and passionfruit vines, all of which are cultivated plants. In contrast, *kls* (*Lobulia stanleyana*), the commonest little lizard in and around houses, is also found in forest clearings several miles from human settlements. It is notable that other wild creatures which are closely and exclusively associated with man and the areas nearest to his settlements are also regarded as unclean and inedible: *kopyak* rats (*Rattus exulans* and *R. ruber*), several small insectivorous garden birds including most notably the Willie Wagtail (*Rhipidura leucophrys*), as also flies, cockroaches, certain crickets, and other insects. Also, *kopyak* rats are not placed in the broader taxonomic grouping, *as*, which includes the other small rodents of genus *Rattus* which are their very close relatives. This is similar to the way in which geckoes are not normally regarded as members of the taxon *yñ* which includes all other familiar small lizards in their size-range. It may be argued that in these cases familiarity, a too close association with man, breeds contempt.

### 4. THE FEAR OF REPTILES

Neither the scope of this paper nor, indeed, the scope of ethnographic enquiries to date among the Kalam, permits us to pursue to any great depth the underlying question of why Kalam, like so many other people, have what may be regarded as an exaggerated and irrational fear of snakes. An adequate discussion of this topic would have to be based on a close study of Kalam childhood experience, socialisation, and depth psychology, which we have not made. Thus, we can throw no light on the hypothesis that part of man's primate heritage is an innate predisposition to react with fear to certain types of shape and movement, which can be exemplified by snakes.<sup>(31)</sup> Nor can we say much that is illuminating with regard to the classic psychoanalytic interpretation that snakes are phallic symbols which represent the father.<sup>(32)</sup> However, it is fitting to conclude this paper with a summary discussion of five points: the aspects of reptilian behaviour which Kalam say that they find frightening; the inculcation or reinforcement of fear of reptiles in children, through the actions of adults

30. Tambiah 1969:449, 451.

31. Morris 1965:214; Hebb 1958:162-4.

32. Jones 1931:94, 169.

and older children, as we have observed this; snakes as phallic symbols, and as symbols of rejuvenation or immortality; and the position of snakes, and of certain lizards, as anomalous animals in overall Kalam animal classification.

#### 4.1 *Frightening aspects of reptilian behaviour*

In describing personal experiences with snakes and lizards which they have found frightening, Kalam stress the element of surprise involved in suddenly encountering them at close quarters, their rapid and unpredictable movements, especially if these are in the direction of the discoverer, and the fact that they bite, or threaten to bite. Of course they are predisposed to be frightened of snakes and other unfamiliar reptiles by the extensive lore about them which they share, but a number of stories have been cited in sections 2 and 3 in which startling or apparently aggressive behaviour on the part of lizards which are fairly familiar (bush skink, beech skink, dragon-lizard, gecko) are reported as frightening.

#### 4.2 *Inculcation or reinforcement of fear of reptiles in children*

Teasing of children, mainly by older children and young adults and not by parents, is a very conspicuous feature of Kalam socialisation. This takes many forms, verbal and non-verbal, but startling a child is one frequent method, and one way in which this is done is by the sudden thrusting of an insect or other small creature near the child's face.

Bulmer's sudden production of a crude black india-rubber toy alligator, about a foot long and superficially not unlike a large gecko in appearance, could be guaranteed to startle older children or young adults who had not seen it before, and cause them to leap away. (He never tried this trick on young children or on older adults.) Once the toy had been examined, the next response was equally invariably to take it and use it to tease others. A dead *soyy* snake offers great possibilities for entertainment. On more than one occasion, we have seen 20 to 30 children, adolescent boys and young men running around with hysterical screaming and laughter while one of the bolder of their number picked up the dead snake in a cleft stick and chased the others.

Kalam men are more prepared to fight and kill in hand-to-hand combat than most men in many human populations. In the decades immediately prior to Australian contact, homicide rates were high, and though most killings were achieved through ambush or deceit<sup>(33)</sup> Kalam were prepared to take high risks in fighting, as they are in many more mundane activities, as for example in the extremely skilful tree-climbing which is a feature of both their hunting and their garden-clearing. At the same time, Kalam have no shame in admitting when they feel frightened. Teasing through startling may perhaps be interpreted as both reinforcing the fear and dislike of this experience, and developing a rapid and appropriate response to this—appropriate, that is, in terms of the possibility of human attack by deceit or stealth.

33. Riebe 1974:81-2 & *passim*.

### 4.3 *Snake and phallus*

In the context of obscene allusion, Kalam are explicit in comparing snakes, eels, the large *gwldak* earthworms and the *ngñolom* skink to the phallus, though reptilian insults are not necessarily phallic. The term *sataw* is a widely used expletive. Used as a form of address, to a spouse or other familiar of either sex, it often merely indicates that the person spoken to has startled the speaker in some way. A man may also use it of his wife, or a woman of her husband, in angry accusations of infidelity or other deceit, implying stealthy and illicit activity. Nevertheless, if used with reference to a male, the allusion often is explicitly phallic. Thus women abusing their husbands for chasing after other women may refer to their penises as *sataw* serpents or *ymgwp* or *kawlam* pythons, prowling in search of prey. A boy with an erection may be teased by the comparison of his member to a *gwldak* worm; though in other contexts, as of a wife ridiculing her husband, mention of *gwldak* might imply that the man's penis was long and thin and limp. To refer to a penis as a *ngñolom* implies that it is small and mottled. We were told that boys seeing men naked when they bathe in the river in preparation for dressing up before a dance might compare large penises to *woknaŋ* or *asnaŋ* eels, but would not dare to do so within earshot of their owners.

The lecherous calls attributed to certain reptiles (2.2.1, 2.3.11) are also indicative of the phallic identification of these creatures.

To note that Kalam associate feared reptiles with startling behaviour, and also compare snakes with penises, is not necessarily to argue that the penis itself inspires fear or symbolises the father in his threatening and disciplining aspect, or threatening senior male figures in general. However, some further evidence suggestive of these connections may be cited from Kalam folklore. In particular, the belief that giant pythons thrust their tails through the anus and into the entrails of their victim presumably originates in, and is partly sustained by, repressed infantile misinterpretation and fear of sexual intercourse.<sup>(34)</sup>

The exaggerated accounts in folk tales of great snakes swallowing and regurgitating men as well as pigs, as also stories of snakes vengefully pursuing men who have disturbed them, and especially men who have removed a pig which the snake had either killed or was preparing to kill, may possibly be argued to reflect a projection of infantile oral aggression on to the serpent as symbol of the threatening and disciplining senior male.

Granted that these psychoanalytic interpretations are both naive and tentative, they may still assist us to understand something of the potency of the phallic snake both as the most powerful of the totems, encapsulating legitimate male ancestral power, and as the witch, the embodiment of evil and of unpredictable aggression.

In this context, it may be noted that parents and other adults both undoubtedly convey to children their own quite genuine beliefs and fears concerning witches, and also on occasion use witches as bogey-men to

34. We have no evidence of sodomy, with male or female partner, as a practice known to Kalam before contact with Europeans and with New Guineans from other parts of the country.

frighten and discipline children. An illustration of this was provided by a young man who described how he and a cousin (FBS) had as young adolescents spent much of their time out hunting birds, and had neglected to assist their families in collection of firewood and other tasks. Eventually, the narrator's father, in exasperation, blackened his face and upper body, put leaves in his head-dress, and armed with a spear, crept up surreptitiously on the boys as they sat in their hunting blind; then suddenly and noisily partially appeared from the bush foliage. The boys thought he was a witch, were terrified, and fled home. Thus, there is some evidence of men identifying themselves with witches in order to control their children.<sup>(35)</sup> This may help us resolve the apparent contradiction of the identifications: serpent = ancestor; and serpent = witch.

#### 4.4 *Snakes and immortality*

Kalam both note that it is difficult to kill snakes and eels, and, like many other peoples, observe snakes slough their skins and associate this process with rejuvenation and, though not literally, with immortality. They have their version of the near-universal myth of death coming to mankind through a dispute between the snake and some other creature, in this case *kopyak*, the reviled house-yard rat.

A very long time ago, rat and snake (*soyy*) had an argument. Rat said: "I shall die first and my body will rot away, and after that all people will die and rot, they won't be able to change their skins." Snake said: "Rat, you wait, I shall die first and I won't rot, I will just shed my skin and, inside, my body will be renewed: if I do this, then men and women will do likewise." But Rat said: "No, I don't want you to do that, I shall die and men and women will copy me." He did so, and since then people have followed the example of the rat.<sup>(36)</sup>

This, like the phallic appearance of the snake, lends potency to its use as a symbol both of ancestral power and of the surviving power for evil of witches, even after their death.

#### 4.5 *Reptiles as anomalous animals*

Classification being a human activity, all classification starts with man. His perceptions of discontinuities in nature and of the relationships between the groups of phenomena he discerns in nature, and himself, are not only governed by his sensory capacities, but in part conditioned by the way he sees his own body, its products, and his most significant social relationships. Of all the other creatures which share man's natural element and are in any way comparable to him in size, snakes (and in

35. The fact that Kalam believe that it is possible for a "normal" man to hire a witch to kill someone on his behalf, and indeed that a great part of the public disputes about witchcraft which we have recorded has been devoted to attempts to discover who might have been *employing* witches, may be argued to facilitate the conceptual association of witches with "ordinary" but nevertheless generally senior and important men who would have the wherewithal to hire them. C.f. Riebe 1974.
36. Recorded on tape, in Kalam and Pidgin versions, by Councillor Simon Peter Gi, October 29, 1973.

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some contexts, legless lizards and giant earthworms) are the only ones which lack limbs. A Pidgin-speaking Kalam informant said to Bulmer early in his field work: "If *sinek* (i.e. reptiles, worms etc.) have legs, men will eat them"—an oversimplification, for as we have seen, some Kalam do eat some snakes, while none eat certain other reptiles which do have limbs, but nevertheless a telling comment on the anomalous status of these most un-human of animals in any way comparable with man. Add to this the fact that some snakes are venomous, and it is hardly surprising that they are accorded special status (positive or negative or both) by all, or nearly all, human societies. Skin-sloughing and rejuvenation, capacity to startle or surprise, the manner of capture, ingestion and digestion of prey, and the gross morphological similarity of the snake to the human penis, are some of the additional characters which influence Kalam, like, doubtless, many other human groups, in their elaboration of the special status they accord to serpents.

The disgust and fear which Kalam show for earthworms is consistent with the relationship they see between these invertebrates and snakes. The special attitudes they show towards certain lizards reflect the characters these share with snakes: minimally the capacity to startle, but also in the case of the two most notable examples, either further explicit parallels with feared snakes ((*ngñolom*, the Banded Skink), or a complex of characters which further differentiate it from "normal" and generally innocuous small lizards (*mwlk-ps*, the gecko).

### APPENDIX A: HISTORY OF ENQUIRY, AND ACKNOWLEDGEMENTS FOR ASSISTANCE

This is the third of a projected series of five reports which review comprehensively the classification of animals by the Kalam people of the Upper Kaironk Valley.<sup>(37)</sup>

In eight periods of field work, totalling some 18 months, between January 1960 and December 1973,<sup>(38)</sup> Bulmer made small collections of reptiles which he deposited in the Australian Museum, Sydney (13 specimens in 1960), the Department of Zoology, University of Auckland (14 specimens in 1963–64), and the Department of Biology, University of Papua New Guinea (197 specimens, from field work between 1963 and 1973). Fourteen species were represented in these collections. Nearly all these specimens were caught for him by Kalam, and only a small proportion was caught in his presence. However, whenever possible he recorded not merely the Kalam name applied, but details of the location of capture, information as to the bases on which reptiles were assigned to particular taxa, whether or not they were regarded as edible, and other ethnographically relevant information.

37. Bulmer & Tyler (1968) on frogs; Bulmer & Menzies (1972–73) on marsupials and rodents; Majnep & Bulmer (in preparation) on birds and bats; Bulmer (in preparation) on invertebrates.
38. Accounts of the location and its ecology are presented in Bulmer & Tyler (1968: 337–9) and Bulmer and Menzies (1972–73: 474–5), and of periods of field work up to 1972 in Bulmer & Menzies (1972–73:476–8).

In 1966–68, Dr G. G. Jackson of the Department of Anthropology, University of Auckland, made collections of reptiles in the herpetologically much richer area of the Lower Kaironk Valley, and deposited these in the Papua New Guinea Museum and in the Department of Biology at the University of Papua New Guinea.

Bulmer was given much encouragement and assistance by a visit in the field from Dr H. G. Cogger, Curator of Reptiles and Amphibians at the Australian Museum, Sydney, in 1963–64,<sup>(39)</sup> who also made a collection of 215 reptile specimens.

However, in spite of the extent of work completed by 1964, problems over the zoological identification of the lizards, which reflected the then chaotic state of taxonomic studies of New Guinea skinks and geckoes, delayed the possibility of publication of a substantial report for nearly a decade.

In 1968, both Bulmer and Menzies joined the staff of the University of Papua New Guinea, and Menzies began the systematic assemblage of reference collections of mammals, reptiles and frogs in the university's biology department. In 1968 and 1971–72 Menzies accompanied Bulmer in the field, primarily to make the study of Kalam mammal classification which has since been published,<sup>(40)</sup> but he also made some small additional collections of reptiles, and examined as much of Bulmer's earlier collections, and of Jackson's collections, as was available in Port Moresby. In 1972, Menzies agreed to co-author the present report.

While on study leave in the U.K. in 1973, Bulmer made a first draft of sections 1 and 2, and also prepared a seminar paper on "Fear of serpents among the Kalam" which covered much of the same ground as sections 3 and 4 of the present report. Meanwhile, Menzies enlisted the aid of Parker in checking the collections, and in reviewing Bulmer's draft. In the light of this most helpful assistance, Parker was invited to be a co-author. Bulmer and Menzies were very pleased by their good fortune in being able to draw on Parker's long experience and expertise with New Guinea reptiles.

In September 1973, Bulmer returned to the field for three months and made small additional collections designed to elucidate questions about the distribution of certain species and Kalam classification of these, and was able to check and extend his general information on Kalam reptile lore.

Bulmer and Menzies are grateful to the University of Papua New Guinea Research Committee and to the Wenner-Gren Foundation who contributed to the support of the periods of field research when the greater part of the data presented in this paper was obtained; to our Kalam assistants, and collectors, especially Ian Saem Majnep of Gobnem and Councillor Simon Peter Gi of Skow, for their indispensable collaboration; to the staff of the Anglican Mission, Simbai and of the Department of the Chief Minister, Simbai, for their generous hospitality and practical assistance in many ways; and to Associate-Professor Joan Robb of the Department

39. Cogger 1964.

40. Bulmer & Menzies, *op. cit.*

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### APPENDIX B: INDEX OF KALAM NAMES APPLIED TO REPTILES AND FISHES

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aypot	2.0, 2.1.5, 2.2.2, 2.2.4, 3.1
bedmeb	2.3.4
ceml	2.2.1
dagol	2.1.2
dmŋawt	2.3.4, 3.1
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kobsal gs	2.6.1
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kwmaŋoyc	2.2.1, 2.2.5
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ñŋiolom	2.1, 2.1.5, 2.1.9, 2.3.7, 3.4, 4.3, 4.5
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soyŋ pok	2.3.2
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sydn mlep	2.1, 2.1.6
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tok	2.0, 2.5
twm	2.0, 2.1
twm adk	2.3.1
wbl	2.0, 2.2.1, 2.2.3
wbl km	2.2.3
wbl mlep	2.2.3
wbln	2.2.1, 2.2.5
woknaŋ	2.0, 2.5, 2.5.2, 2.5.3, 2.7, 2.7.2, 4.3
woknaŋ mokal-wt	2.5.2, 2.5.3
wowy	2.0, 2.2.1, 2.2.5, 3.4, 3.5
yejw	2.4
ymgwp	2.3.4, 2.3.5, 3.1, 4.3
yñ	2.0, 2.1, 2.7, 2.7.1, 2.8, 3.5
yñ ladk	2.3.1

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