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Despite this reality of major importance, no one knows how many Iban are in SibU. In my research proposal, I had indicated that I should

describe the units resident in SibU,  
period of greatest immigration,  
and demographic patterns of the urban  
and rural areas . . . from  
census data.

Another reality I encountered, however, is that census data for such a description do not exist. This is in no way intended as a criticism of the Department of Statistics. According to two members of that Department's SibU office, they neither have the staff nor the categories to produce such data. Further, today's census would be unreliable tomorrow with the coming-and-going of the very mobile Iban.

Despite this lacuna, however, or perhaps because of it, it is important to establish the reality of the situation and, at the same time, responses to it.

During the first week in SibU, I visited the Department of Statistics and talked with one of the staff. Asking for information about the above, I was shown the 1970 and 1980 censuses, neither of which contained as specific information as I required. Having looked through the censuses with the staff member, I asked him his estimate of the number of Iban in SibU. "Three or four hundred," was his answer. But, I queried, there were that many in 1960, about 3,500 in 1970, and surely more by 1980. Taking another tack, I asked him what percentage of the population was Iban in 1980. "About five percent," he replied. I then asked the SibU urban population in 1980, and he said, "131,000." Immediately, we agreed that the Iban population in 1980 was over 6,000-not, "three or four hundred."

Equally significant as the problematic data are the psychological reactions to the reality of Iban immigration. When I first ventured that there were 10,000 or more Iban in SibU, the same staff member responded, "There can't be, because they are orang ulu (upriver people; technically, people in the more remote, easterly regions

of Sarawak). "Therefore," he continued, "they wouldn't want to come into towns."

This stereotype of Iban as orang ulu was repeated by another member of the same department when I visited the office during the second week of August. Having been told by the first staff member that they had obtained data which would be useful to my research, I went to the office, but neither he nor the Divisional Director was in. When I explained my research to a Malay staff member, he, also, assured me that there couldn't be many Iban in SibU, "because they are an interior people."

This image of Iban is widely held, and not by civil servants alone. Discussing my research with a Chinese businessman, I was quickly informed that it was interesting but that I wouldn't find many Iban in SibU. "They are orang bumai" (farmers, strictly, hill-rice farmers).

During several presentations to local service clubs, secondary school students, and church groups, I encountered similar stereotypes and even more explicit denial or rejection of the possibility of Iban urban migration. The following examples illustrate the reactions of Chinese (and probably other groups as well) to the movements of Iban:

I do not believe that Iban are coming to town. Where are they? Do you encourage them to come to SibU? Is it good or bad? How can they improve their way of life in the rural area? And, The Iban should not come to SibU. How can we stop them?

As innocuous as these questions may sound, the defense mechanisms noted above -- stereotyping, denial, and rejection -- contain a variety of feelings, anxieties, and, even, resentments. An altercation which occurred on the morning of July 5th at the "Iban Market", and was observed and described by an Iban graduate student on holiday from overseas study, reveals the depth and intensity of emotions of townsfolk concerning the potential competition from urban migrants.

One category of "Iban-on the-street" (and off it, too), deserves comments and will require special attention, viz., Iban youth. Sixty-eight percent of Iban I contacted are 18 years of age or younger (1,374). Eighty-five percent (1,160) of them are still in school, and the others (214) of the latter describe their situation as jobless (nadai kereja), as living with relatives or friends, or, whatever their circumstances, not permanently employed. For several reasons, but most notably the exposure of primary and secondary school students to the town, and equally important, the experience of dependence upon government support of their room and board, this category of urbanizing Iban deserves careful attention because (1) it is likely to grow larger and more rapidly than categories of older Iban, and (2) its constituents are learning a new value system, one in which they are being provided for without work or any assumption of responsibility other than "being there."

## II. Identification of Concentrations on Iban

In contrast to settlement patterns in most other Southeast Asian towns and cities, Sibü has no exclusive "ethnic wards" or neighborhoods. While it is true that Chinese predominate in the pasar and Malays and Melanaus in the various kampong, even in these areas Iban and members of other ethnic groups live amongst these numerically larger societies.

Responses to a survey distributed to 1,500 Iban show that Iban live in almost all parts of Sibü. Within this relatively broad distribution, it is possible to identify 7 areas of higher concentration to almost exclusively Iban. These are:

- Usaha Jaya, Upper Lanang Road, where there are 178 "Iban houses", either completed and occupied, or under construction;
- Lanang Camp, where live approximately 400 Iban men and their families;
- school boarding houses for secondary schools, especially Kampong Nangka and Rosly Dhobi;

- Sungai Antu; where there are 38 squatter families on titled land, 24 families being Iban;
- the Police barracks on Jalan Tun Abang Haji Openg;
- Pulau Kereto, the west side of the Batang Igan, Batu Enam; and
- the Nang Kiew Hotel, where at any time there are between 12 and 30 prostitutes.

It cannot be emphasized strongly enough that these areas of higher concentration are just that; and that Iban are dispersed and distributed in all other sections of Sibü.

## III. The Evidence

We acknowledged at the beginning that no one knows how many Iban there are in Sibü. The number varies from day to day, given the mobility of the population. And there may be disagreement as to how many is many. But the evidence is clear that (1) there are more than there were a decade ago and (2) there are more than there were a year ago.

We believe that the worldwide process of urban migration, in which the most dramatic demographic change in human history is taking place, includes Sarawak. The United Nations estimates that at mid-century, 75 percent of the world's population was rural. For a multitude of reasons, some social, others personal, by the end of this century 75 percent of the world's population will be urban.

One government officer jokingly observed that "Sarawak usually lags behind other countries. What happens in other places happens here about 50 years later." While this self-deprecating remark may have been true for the first half of this century, and although there clearly are technological gaps between Sarawak and more developed countries, instantaneous communications now tie Sarawak to an emerging worldwide system in which all

And one of these trends is easier movements between rural and urban areas, and the entrance of more rural folk into towns and cities. If, indeed, "what happens in other places happens here about 50 years later," the years to come will be exciting--or depressing--as Sibuh continues to grow in territorial size, and in population. They will be exciting, if the challenges of planning for and servicing the growing population are met. They will be depressing if these challenges are ignored or are not met, and, as has occurred in numerous Third World cities, e.g., Manila and Sao Paulo, cities are blighted with "instant slums" and choked with traffic.

#### A. Observations

On three occasions, using "sighting" as a basis for enumeration, I attempted to calculate the proportion of Iban "on the street" in the pasar area. Specifically, I walked from the Hoover House on Island Road to Blacksmith Road, north on Blacksmith Road to Central Road, east on Kampong Nyabor Road to Channel Road, south on Channel Road to Island Road, and back to the Hoover House.

Several qualifications and cautions must be made. First, I did not count persons in shops or businesses, nor motorists. I counted pedestrians on the street or, near the Municipal Council, just off the street. The shops along the route are almost exclusively Chinese, who also predominate vehicular traffic. Second, the time of day is crucial to the proportion of different ethnic groups. For example, between 6:00 and 6:30 a.m., 50 percent of the pedestrians along Island Road are Iban, coming from or going to the Guest House. The proportion drops to less than five percent in the period from 6:30 to 8:00 a.m., as Chinese and Malays come to work and numerous school children arrive at the Methodist Primary School. Or, along Blacksmith Road, the proportion of Iban is relatively low in the early morning hours, i.e., 7:00 to 9:00 a.m., but is deceptively high in the late evening hours, i.e., 7:00 to 9:00 p.m., when many teen-age and young adult Iban are on Blacksmith Road or just inside the alleys on either side of the road near the Nang Kiew Hotel. Third, it is easy to confuse physical features and ethnic identity. For example, when an Iban and I did a preliminary survey of Sungai Antu and Kampong Nyamok, we

encountered two teen-age girls whom the Iban mistook for fellow Iban and asked directions to the bus; the girls turned out to be Malays. I took pleasure in jokingly asking him, "If you can't tell Malays from Iban, how do you expect us non-Iban to do so?"

I do not consider the estimated proportions of Iban to be in any way scientific. One of the canons of science is replicability of results or findings, and, depending upon numerous factors and circumstances, the proportions I estimated would certainly vary. And, some of my "sightings", based upon the visual recognition of Iban, were corroborated by "hearings", i.e., overhearing conversations between Iban. For example, on one of my walks I observed and heard a more experienced "parking attendant" (one who tickets parked cars) telling an Iban who had just started work that day how he should do his job.

Observations were made at 6:30 a.m., 11:30 a.m., and 6:30 p.m. on three separate days. The days were week-days, but did not include a Friday. None was made on a holiday.

From sightings, I made the following estimates of proportions of Iban along each stretch, averaging the percentages from each walk.

1. Island Road, from Hoover House to Blacksmith Road:	14%
2. Blacksmith Road from Island Road to Central Road:	8%
3. Central Road from Cross Road to Kg. Nyabor Road:	7%
4. Kg. Nyabor Road from Central Road to Channel Road:	6%
5. Channel Road from Kg. Nyabor Road to Island Road:	18%
6. Island Road from Channel Road to Blacksmith Road	12%

Although the pasar area is dominated by Chinese, nonetheless there are small areas to more extensive parts where, depending upon the time of the day, Iban are clearly numerous. For example, groups of Iban youth gather under the Municipal Council clock, in the area

formerly used for teaching driving, and from early evening until early morning around and just upriver from Pulau Babi. Channel Road is another street where Iban may predominate.

But, risking repetition, I must emphasize that these estimates of proportions of Iban are impressionistic observations and are in no way to be construed as reliable. They were made for want of any current data.

#### B. Interviews

Estimates of the Iban population also have been made on the basis of interviews with Government Departments and private organizations in which a relatively large number of Iban are employed. In this estimate, it is likely that the error will be one of omission, that is, a calculation on the low side. Such an error of omission is unavoidable; we do not know, nor do resources permit soliciting information from, all organizations in which Iban work.

In estimating the Iban in Sibul based upon interviews, I contacted the chief officer or his assistant, and asked for the number of Iban employees. Assuming a universal average of five members per family unit, I multiplied the number of employees by five. Again, I stress that this procedure and its results are not scientific, but are an effort to use available evidence to deduce the approximate number of Iban in Sibul.

The following represent the numbers of Iban employees in the principal Government and private sectors, and the estimate of the Iban in each sector:

AGENCY	IBAN EMPLOYEES	TOTAL IBAN
Field Force	400	2,000
Police:		
Police	123	615
Border Scouts	315	1,575
Construction Workers	200	1,000
Other Government Dept.	350*	1,750
Employees, Sungai Antu	24	120
Misc., not included in above	300**	1,500
Prostitutes	400***	400
Total	2,112	8,960

\* This figure includes 178 residential units in Usaha Jaya, Lanang Road, of which a majority of the family heads are Government employees, e.g., in Lau King Howe Hospital, Land and Survey, Agriculture, etc.

\*\* This figure is based upon observations of Iban as ticket sellers on buses, parking attendants, waiters and waitresses in coffee shops, hotels, and restaurants, etc.

\*\*\* Although I am aware of some situations in which prostitutes are living with other members of their families, this estimate assumes that a majority are living alone or with friends, and the application of the figure for the average family size is not appropriate.

On the basis of information provided by the Divisional Educational Officer, the Iban represent just over ten percent of the students in Sibul Urban/Municipal Secondary Schools in 1984. By school, the number of Iban and total number of students are as follows:

SCHOOL	NO. IBAN STUDENTS	TOTAL
SMK Kampung Nangka	50	729
SMK Rosli Dhoby	460	1,169
SMK Sacred Heart	95	1,613
SMB Methodist	86	1,810
SMB Chung Hua	181	1,644
SMB St. Elizabeth	126	1,631
SMB Tung Hua	49	1,457
SMB Tiong Hin	45	720
Total	1,092	10,733

Iban pupils represent 7.6 percent of students in Sibul Urban Schools, at Primary level:

	NO. IBAN STUDENTS	TOTAL
Sacred Heart Chinese	3	1,254
Sacred Heart English	180	562
Thai Kwong	1	167
Guong Ann	5	310
Chung Hua	12	1,244
Dung Snag	6	545
Kiew Nang	0	136
Methodist	51	1,233
Uk Daik	4	939
Ek Thai	5	509
Hua Hin	40	216
Abang Ali	64	1,075
St. Mary	53	298
Chung Sing	1	315
Bandaran Sibul No. 2	351	1,099
Bandaran Sibul No. 3	83	736
Bandaran Sibul No. 4	125	1,250
Tung Hua	4	956
Tiong Hin	1	522
St. Rita	167	537
Taman Rajang	4	1,275
Total	1,160	15,173

Data on Iban students in private secondary schools are not available at this time.

### C. Conclusion

We acknowledge again that no one knows how many Iban are in Sibul. Nevertheless, it seems reasonable to conclude tentatively that the Iban population of Sibul is between 10,000 and 15,000, despite the paucity of hard data. This tentative conclusion is inferred from (1) the estimate of the number of Iban in the Sibul labor force, and the total number they represent, (2) the number of Iban secondary and primary school students, and (3) the proportion of Iban observed as described in Section III.A. Despite the admitted "softness" and unscientific approach of the 1st; despite the possible overrepresentation by boarders whose families do not reside in Sibul, in the second group; and despite the possible underrepresentation of Iban working in Sibul, not accounted for in the agencies and employment categories in the first group--we believe the estimate of the Sibul urban Iban population to be approximately correct.

### PLANTATION DEVELOPMENT IN WEST KALIMANTAN I: EXTANT POPULATION/LAB BALANCES<sup>1</sup>

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### PREFACE

This is the first of two papers on plantation development that I wrote in 1982-1983, while working for the Rockefeller Foundation in Indonesia. They are concerned with one of the perusahaan negara 'state corporations', that direct much of the plantation agriculture in Indonesia. These corporations were established

with the assistance and encouragement of the World Bank, in order to inject more free enterprise into the government's management of this sector of its economy. The World Bank has gone on to help finance many of the development projects of these corporations including the one discussed in this paper.

The focus of the discussion in this first paper is a Perkebunan Inti Rakyat 'Peoples' Nuclear Estate'. This combines a large centralized 'nuclear' estate, owned and run by the government plantation, with many small surrounding 'plasma' estates, owned and run by peasant smallholders. This is seen as a way of combining the efficiency of the old colonial model with the democracy and higher peasant standard of living of independent and modernizing Indonesia. This new model of plantation development has garnered ever greater government support since 1982, and it is now even seen as a possible alternative to the routine unsuccessful models for subsistence food cropping in transmigration sites.

I undertook this study at the specific request of one of the state plantation corporations (PNP VII), which wanted to find out why its PIR project in West Kalimantan was experiencing so many problems, in particular vis-a-vis the local tribal population.<sup>2</sup> At the time of this request, the project was at the stage of surveying and clearing land, establishing nurseries for oil palm seedlings, and so on. For a number of reasons, including cultural, ecological, economic and political ones, I thought that this project was ill-suited to the area. If I had then voiced this sentiment and recommended the termination of the project, however, the project would not have ended but any chance I might have had to improve it would have. Accordingly, I took the existence of this project as a given, regarding this acceptance as a prerequisite to any attempt on my part to make aspects of the project better than they might otherwise have been.

This proved to be the beginning of over three years of work on an advisory basis to various government offices involved in plantation agriculture, up to and including the ministerial level. Most of the criticisms and suggestions that I made in the course of these three years were ignored or rejected outright, but a few were accepted

or at least given a hearing. This, then, was the return on my decision to try to work with the plantation officials and development planners as opposed to condemning them and their projects outright. The latter course of action is sometimes appealing emotionally, but practically it shuts off any chance of having input into the development process. It is, therefore, particularly convenient for Western scholars whose indignation over the course of third world development greatly exceeds the amount of personal time that they are willing to devote to changing it.

## I. INTRODUCTION

A constant problem in development planning in areas of extensive, subsistence agriculture is the misconception of extant patterns of land use. Frequently this involves a basic misunderstanding of forest fallow systems of cultivation--of the large amount of land required per capita under such systems, and of the consequently low carrying capacities of the environments that support them. In this paper I will attempt to show that one of the most useful ways to review the planning and execution of the state plantation projects in West Kalimantan is in terms of extant and projected population/land balances in the project areas. This perspective is especially useful in considering the two problems of selecting participants for the project (viz., local versus extralocal inhabitants) and compensating or not compensating local inhabitants for land used in the project. I will develop this perspective using secondary data (supplied by PNP VII) on the PIR Khusus oil palm project at Pusat Damai, in the subdistrict of Parindu (in Sanggau district).<sup>3</sup> The principles thereby illustrated should also apply, however, to other state plantation projects elsewhere in Kalimantan, as well as elsewhere in Indonesia.

## II. POPULATION/LAND BALANCES UNDER SWIDDEN AGRICULTURE

The PIR Khusus project in Parindu is being developed by Perusahaan Negara Perkebunan VII 'State Plantation Corporation No. 7', hereafter referred to as PNP VII. In a 1981 report on this project, they state that the average family in the subdistrict of Parindu cultivates 3.2

hectares of land by a system of swidden agriculture (PNP VII 1981:3-4). Given an average family size of 6.3 (PNP VII 1981:3), this represents an average of .51 hectare per capita. This is not an atypical figure for West Kalimantan. My own research among the Kantu' in West Kalimantan, near the Malaysian border in the vicinity of the Kapuas lakes, yielded a similar per capita land use figure of .59 hectare per capita (Dove 1985). (Comparative figures from Sarawak and the Philippines are .32 hectare per capita and .61 hectare per capita, respectively [Freeman 1970:248; Conklin 1957:145]). While the per capita land use figure for Parindu is probably valid, however, its significance for the overall pattern of land use has been misunderstood. Thus, the Parindu report (PNP VII 1981:4) states that only 2.4 percent or 3,100 hectares of the district's land area (totalling 131,300 hectares) is involved in swidden agriculture. This figure was apparently arrived at by multiplying the above per capita land use figure (viz., .51 ha) by the number of people involved in swidden agriculture. There are a number of problems with this calculation,<sup>4</sup> but the main one is that it does not take fallow periods into account.

The figures cited above for the Kantu', Iban, and Filipinos are all for land cultivated per capita per year. They do not include land under fallow. In the case of the Kantu' of West Kalimantan, for example, each family cultivates an average of 4.58 hectares per year (for an average of .59 hectare per capita), but each family owns an average total of 62 hectares -- over 90 percent of which is under forest fallow in any given year. This large proportion of fallowed land to cultivated land is due to the need to restore the fertility of the land (actually its biomass) after each cropping, by allowing it to revert back to forest. This characteristic of swidden agricultural systems clearly holds in Parindu as well, where it was reported (PNP VII 1981:3) that swidden fallow periods average twelve years. Thus, the actual amount of land involved in swidden agriculture is not 3.2 hectare per family or .51 hectare per capita, but 41.6 hectares per family (=  $3.2 \times [12 + 1]$ ) or 6.63 hectares per capita (=  $.51 \times [12 + 1]$ ) -- assuming one year of cropping (in rice, although probably two years in tubers) before fallowing.<sup>5</sup>

If we now consider not just cultivated land but fallowed land as well, a very different picture of land use in Parindu emerges. Taking yearly land use per capita (.51 ha) plus fallowed land per capita ( $12 \times .51$  ha), and then multiplying this total by the population of Parindu ( $6.63$  ha  $\times$   $13,787$ ), we obtain a total of 91,408 hectares of land involved in the system of swidden agriculture. This amounts to 70 percent of the total land area of the subdistrict. Assuming that no more than 75 percent of the subdistrict is either suitable or available for cultivation, then the 91,408 hectares of land involved in swidden agriculture represent fully 93 percent of the arable land in Parindu. By these calculations, at the time of this study the population of Parindu was already pushing the carrying capacity of the district under swidden agriculture. Given per capita land use of .51 hectare/person/year, and given a one-year cropping period followed by a twelve-year fallow period, the district's carrying capacity is 14,853 persons (or 11.3 persons/km<sup>2</sup>), which is just 7.7 percent greater than the extant population.<sup>6</sup>

Having calculated the current population/land balance in Parindu, it is now possible to calculate the probable impact on this balance of PNP VII's oil palm project. The project design calls for developing a total of 315 square kilometers for the eventual support--largely by oil palm cultivation--of 4,500 families or 28,350 persons (assuming an average family size of 6.3 persons). The project design also stipulates that all or most of these families should be transmigrants, which means that the extant native population would have to vacate these 315 square kilometers and settle elsewhere in the subdistrict. Population figures suggest that at the time of this study the project area contained approximately 3,308 local tribesmen, while the remaining 998 square kilometers in the subdistrict contained approximately 10,479.<sup>7</sup> The carrying capacity of the latter area under swidden agriculture should be approximately 11,290 people (using the formula presented earlier<sup>8</sup>, which means that it could receive a maximum additional 811 persons -- far fewer than the 3,308 persons native to the project area. Supposing that all of these people are nonetheless moved out of the project area and into the remainder of the district, the inevitable result will be a shortening of the swidden cycle there. This area can support an additional 3,308



persons only by a shortening of the average fallow period from 12 years to 9.6 years.<sup>9</sup> This 20 percent reduction in the fallow period, in turn, might well increase the risk of environmental degradation.

### III. PARTICIPANT SELECTION AND LAND COMPENSATION

These calculations argue forcibly for offering all of the people currently living in the project area the opportunity to become project participants. To do otherwise, for example to displace them with transmigrants, would endanger the success of the project. Since the rest of the district cannot absorb all 3,308 people, there will be a constant threat of them practicing swidden agriculture in the project area if they are not themselves brought into the project economy. This will be true whether or not PNP VII buys their land from them.

In buying land from the local people, PNP VII has distinguished between land targeted for nuclear estates (to be run directly by PNP VII) and nonagricultural use (e.g., housing schools, etc.) on the one hand, amounting to a total of 71 percent of the project area, and land targeted for smallholdings (to be owned and run by the farmer participants) on the other, amounting to 29 percent of the project area. Apparently based on an assumption that the local owners of land in the former areas cannot become smallholder participants in the project, whereas the owners of land in the latter areas can or might, PNP VII initially offered compensation only to the former. The latter, especially if they did indeed become participant smallholders, were deemed to not need compensation. This distinction has largely been lost on the local people, who see the impact of the project on their land rights as the same regardless of whether that land is taken for use in a nuclear estate, a smallholding, or a village school. Even if their land is taken for a smallholder estate, for example, and even assuming that they are project participants and will become smallholders, it usually is administratively impossible to assign to them the smallholding located on their own former swidden land. This, coupled with the fact that the size of the smallholdings is much less than the average size of the former swidden holdings, produces a sense of loss in local people who become project participants and receive

no compensation for their land.

In compensating the local inhabitants for land used in the project, therefore, it is best to base compensation on distinctions that they make themselves, whether these are officially recognized or not. First, a distinction should be made between those inhabitants of the project area who choose not to become participants, and those who do: the former should clearly receive the greatest compensation for their land. Second, among those inhabitants who do choose to become participants, a distinction should be made between those who hold traditional title to a lot of land and those who hold title to little or no land: the former should receive the greatest compensation. Alternatively, those holding traditional title to the most land could be given larger smallholdings. It seems only just to make this recognition of extant local differences in wealth and (probably) ability and industriousness, although neither this nor any other plantation program in Indonesia has to date done so.<sup>10</sup>

In all compensation of land, it is important to deal directly with the local inhabitants as opposed to the local government. The latter may not recognize or understand the traditional land rights that are at issue here, and in any case it is likely to be influenced by self-interests that have nothing to do with plantation development. This last point is illustrated by the case of Gunung Meliau, another PNP VII project in West Kalimantan. By 1982 the plantation officials here had spent five hundred million rupiah (then equal to about \$800,000) in land compensation at this site, channeling it all through local government officials, but had managed to secure title to only about five thousand hectares of land. This effective sale price of one hundred thousand rupiah (viz., \$160.00) per hectare was about five times as high as prices that I had recorded elsewhere in the interior of West Kalimantan, strongly suggesting that most of this money was not getting to the tribesmen who actually held the traditional title to the land.<sup>11</sup>

Aside from the question of land compensation, another matter of importance is support from PNP VII to project participants during the period before their smallholdings become productive. It is clear that the participants

cannot live solely off of the 1.25 hectares of dryland field and .25 hectare of garden that are set aside for each family. Since this 1.5 hectares amounts to only 3.6 percent of the average landholdings of these families under swidden agriculture, they will have to depend on direct support from PNP VII (viz., wages, loans, or subsidies) for all or most of their livelihood until their smallholdings begin to produce. If this support is insufficient, the participants will likely be forced to practice swidden agriculture within the project area in order to survive.

#### IV. MATTERS FOR FURTHER STUDY

The data on Parindu that were in the possession of PNP VII (and made available to me) at the time of this study were deficient in several respects. First, regarding the local systems of swidden agriculture, more exact data were needed on the amount of land cultivated per capita per year, the length of the cropping period, and the length of the fallow period. In addition, the exact relationship between swidden agriculture and the local system of rubber cultivation needed to be studied further, in the expectation that this would yield information of relevance to the involvement of the local inhabitants in oil palm cultivation. This would include a study of the geographical distribution of swiddens and rubber groves, as well as the scheduling of labor in the former versus the latter. The size, labor inputs, and yields of the rubber groves also needed to be studied, as did the reason why the rubber purportedly was so 'poorly cultivated' (PNP VII 1981:3). Was the reason a lack of knowledge, a lack of labor, or was it just that the rubber was cultivated as well as the inhabitants needed to cultivate it? Finally, more information was needed on the traditional system of land tenure, including information on what land rights' consist of, how they are acquired, how they are held by the individual family and/or village, if they can be bought and sold, and if they are the same for swidden land as for rubber grove land.

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#### NOTES

1. This paper was first read in a seminar at the headquarters of PNP VII in Bah Jambi, North Sumatra, on 31 May 1982. I am grateful to Dr. S. Pulungan, former finance director for PNP VII, for this and subsequent opportunities to work with the PNP VII staff. An earlier version was published in the Indonesian Journal of Geography (Yogyakarta), Vol. 12, No. 43, pp. 23-28. I was supported during the initial writing and subsequent revising of this paper by the Rockefeller Foundation, the Ford Foundation, and the Environment and Policy Institute (EAPI) of the East-West Center, none of which institutions are responsible for the opinions and analysis presented here, however.
2. All of my work with PNP VII was supported by the Rockefeller Foundation, however, and not by the plantation itself.

3. PIR Khusus (or Perkebunan Inti Rakyat Khusus) translates as 'Special People's Nuclear Estate'.
4. The number of people involved in swidden agriculture in Parindu subdistrict was apparently calculated at 6,078 persons, given that the product of 6,078 persons and .51 hectare is 3,100 hectares. However, the actual population of Parindu at this time was 13,787 persons (PNP VII 1981:3), which should have yielded a figure of 7,031 hectares as being involved in swidden agriculture, using the plantations' own formula (which was flawed for other reasons as well).
5. PNP VII's figure of .51 hectare per capita obviously cannot include fallowed land, since this would mean that only .04 hectare is being cultivated per capita per year (= .51 - [12 + 1]). Since a rice harvest of one ton (of unmilled rice) per hectare is all that can be expected in West Kalimantan, .04 hectare would yield a maximum of just 40 kilograms per capita per year, whereas annual requirements average 365 kilograms (Dove 1985).
6. a.  $(131,300 \text{ hectares} \times .75) - (.51 \text{ ha} \times [12 \text{ years} + 1 \text{ year}]) = 14,853 \text{ people}$   
 b.  $(14,853 \text{ persons} - 1,313 \text{ km}^2) = 11.3 \text{ people/km}^2$
7. a.  $([315 \text{ km}^2] \times 13,787 \text{ people}) = 3,308 \text{ people}$   
 b.  $([998 \text{ km}^2 - 1,313 \text{ km}^2] \times 13,787 \text{ people}) = 10,479 \text{ people}$

8.  $(99,800 \text{ ha} \times .75) - (.51 \text{ ha} \times [12 \text{ years} + 1 \text{ year}]) = 11,290 \text{ people}$
9. a.  $([99,800 \text{ ha} \times .75] - [10,479 \text{ people} + 3,308 \text{ people}]) = 5.43 \text{ ha/person}$   
 b.  $(5.43 \text{ ha} - .51 \text{ ha/person/year}) = 10.6 \text{ years}$  or  $9.6 \text{ years fallow} = 1 \text{ year cropping}$
10. The reasons why this has never been done probably include the fact that it is administratively more complex, as well as the fact that most government officials mistakenly view tribal economies as 'communally' inclined and hence are not sensitive to the great diversity in property that in fact exists in these economies (see Dove 1982).
11. Any such government purchase of local land rights tends to be exploited by regional political and economic elites (see Dove in press).

AN ETHNOLOGICAL SURVEY OF THE  
KELAI RIVER AREA  
KABUPATEN BERAU, EAST KALIMANTAN

Antonio J. Guerreiro (CeDRASEMI)

Introduction

Very little information is available on kabupaten Berau,<sup>1</sup> especially concerning ethnic groups. The purpose of this article is to give some basic data about the ethnological and linguistic situation on the Kelai river area.

Obviously the Kelai river does not present any natural obstacles such as rapids between Tanjung Redeb and Muara Lesan (see Map 1). However, there is no regular boat service (taxi-air) as in Kutai along the Mahakam and its tributaries. All transportation occurs by longboat or perahu with outboard motors (cés, ketinting and tempel). There is no road or airstrip. The few boats (kapal motor) belong to timber companies; they are used for supplies and to haul the log-rafts. Traffic is limited and goods become scarce and expensive as one goes upriver.

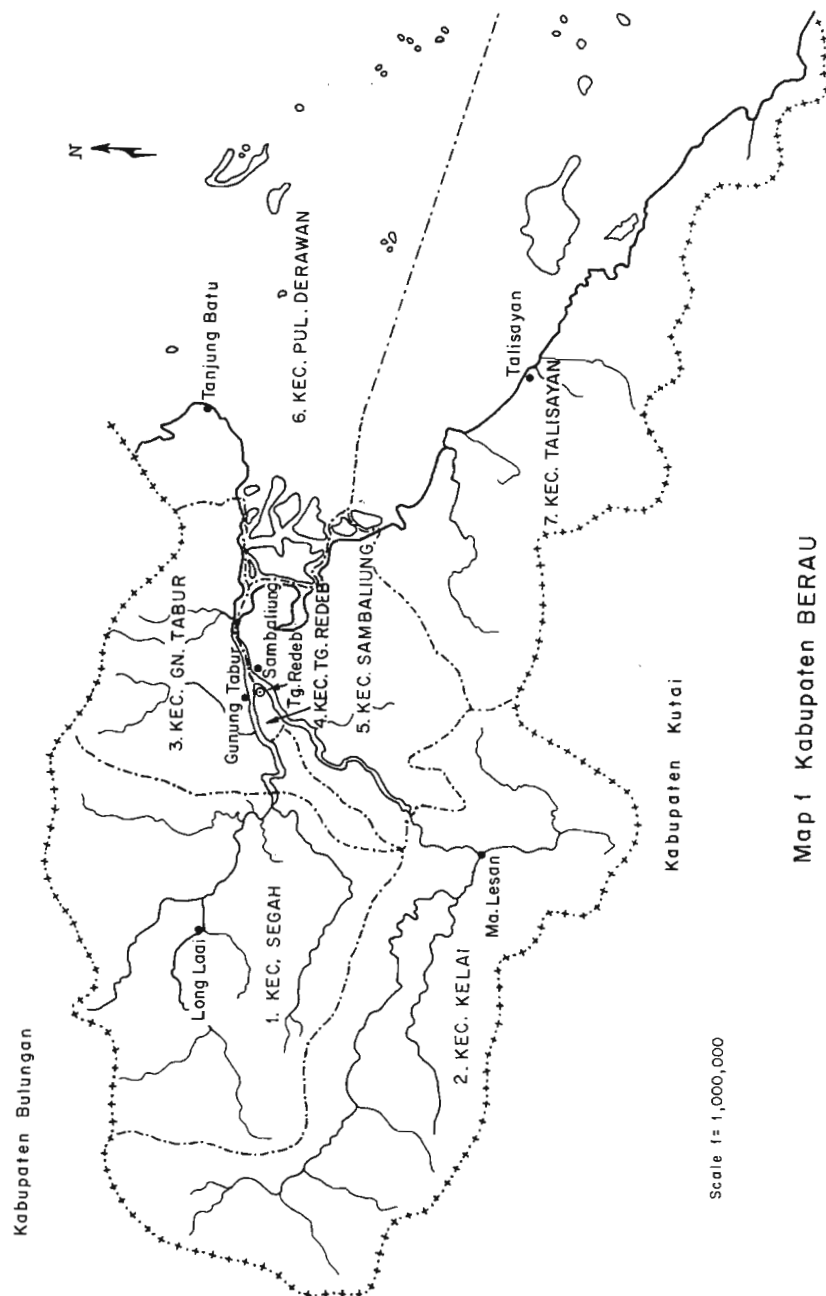
Upstream of Muara Lesan it is necessary to use a longboat or a dugout, but small rapids are found only after Long Gie. From there two or three days will be sufficient with a cés to reach Long Sului, the last Punan kampung, of course according to the water level. The journey from Tanjung Redeb to Long Gie takes about two days (with a 30 HP engine) and one day back, if one stops for the night.

The Ethnic Groups

Up to now the most accurate presentation of Berau's populations remains that of Dewall<sup>2</sup> who gives an idea of the spatial distribution of ethnolinguistic groups on the Kelai and Segah area. We will reconsider his classification according to our data.

The Dayaks constitute four main groups:

1. The Segai, frequently mentioned in the litera-



Map 1 Kabupaten BERAU

Scale 1:1,000,000

ture, are called Segayi by the Berau Malays; they are part of the Modang cultural and linguistic group. They came from Apo Kayan (Kəjin) during the 18th century, directly from the Kayan Uk (Kəjin so') to the upper reaches of the Kelai, and also probably via the Pangean river to the Segah. Now they are still separated in two groups with minor divisions, one along the Kelai river, the other on the upper Segah centered near Long Laai (La'ay). Mənggəe is their true autonym, which is also the name of their isolect (siu Mənggəe). But they are known by the Kenyah and Kayan as Ga'ay. Like the other Modang sub-groups they do have the men's house (sun tah).<sup>3</sup>

2. The Kenyah (Uma' Baka<sup>4</sup>) have come from Apo Kayan at the beginning of the century, they were established at Long Gie on the upper Kelai. Lately other sub-groups arrived: Uma' Kulit, Badang.

3. The Punan Kelai (autonym Mnan) are located only on the upper reaches of the Kelai. It is possible that this group came originally from the montaneous area between the Kelai and Telen watersheds. But actually they do speak a Modang language (wa' mnan) which is a mixture of the Modang Wə h ə a (kecamatan Muara Wahau, Kutai and the Mənggəe of the Kelai.<sup>5</sup> A small group (7 families) recently moved (1981) to the Sele' river, a tributary of the Wahau. The Punan Segah or Punan Malinau are a distinct group.<sup>6</sup>

4. The Lebu (autonym Ləbbo) are part of a larger Basap group,<sup>7</sup> which is also spread over a wide area in Bengalon and Sangkulirang in Kutai. Lexically one notes a differentiation between two river based groups: the Inaran (Ləbbo isi) and Lesan (ulun Ləbbo).

The Malays (orang Bənu'a') settled a long time ago in the delta area. During the 19th century they founded the rival sultanates of Sambaliung and Gunung Tabur respectively on the right and left bank of the Kelai river.<sup>8</sup> In the second half of the 19th century they have progressed upriver creating thus new kampungs. While in this period the Bajau and Suluk (Tausug, etc.) were also wandering about at the mouth of the Berau river.<sup>9</sup> And now the Bugis people have started moving in the Kelai. However population density is very low in Berau: 37

inhabitants per sq. km. in 1982,<sup>10</sup> so there is still room for new settlers. Paradoxically, there is not so far any transmigration program functioning in the area.

### The Villages

We shall consider here two kecamatan, Sambaliung (2,835 sq. km.) and Muara Lesan (7,960 sq. km.) with a population of 5,948 and 2,560 respectively.

#### Kecamatan Sambaliung<sup>11</sup>

1. Rantau Panjang (pop. 342), Malay (orang Bənu'a') 100% Islam.
2. Pegat Bukur (pop. 170), Malay (orang Bənu'a') 100% Islam.

Opposite the village on the right bank, one finds a base camp of the timber company P. T. Suaran.

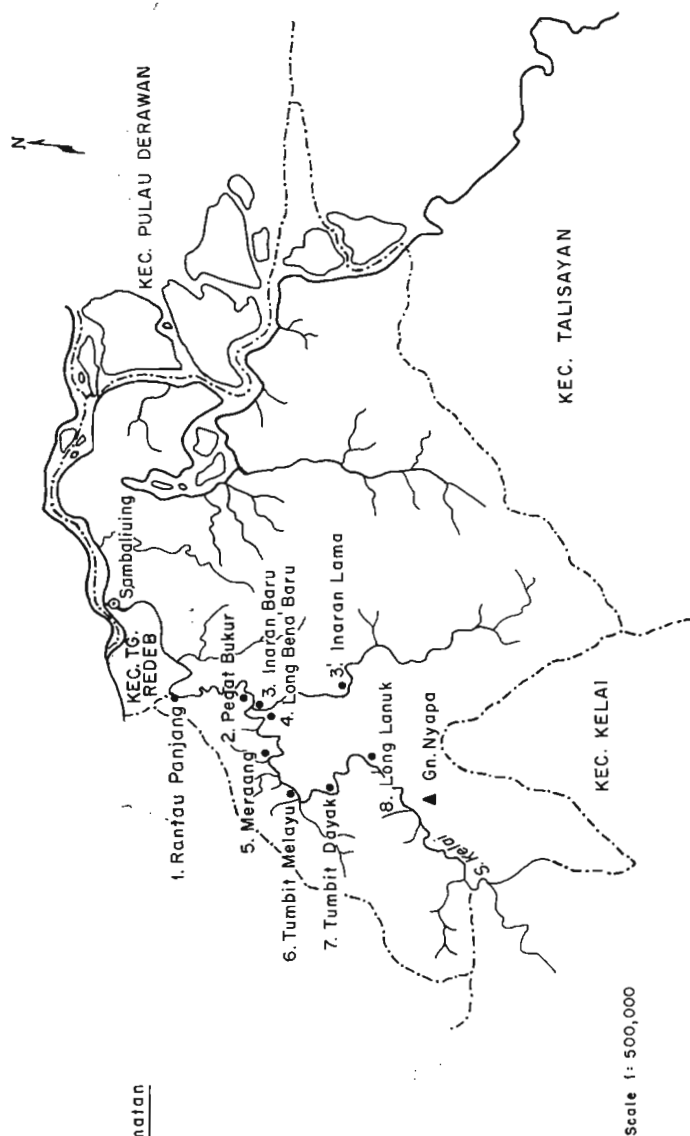
3. Inaran Baru (pop. 151).

This new village is actually a PKMT project of the Social Department (Depsos).<sup>12</sup> The Lebu were living formerly on the Inaran river. They were resettled here in 1981. According to the Depsos peqawai they are approximately 75% Islam (muallaf, new converts), 10% KINGMI and 15% adat. The Lebu are former hunter-gatherers but they already had shifted to paddy cultivation while on the Inaran river. However they still collect jungle produce: rattan, gaharu, damar, getah, etc.<sup>13</sup>

About a quarter of an hour upriver one reaches another new settlement:

4. Long Bena' or Long Bena' Baru (pop. 323), 100% KINGMI.

This is a recent emigré Kenyah Badang village (1983). Formerly they were living on the upper Lurah river (kecamatan Punjungan). They paddled down the Kayan river and the Segah, then they went up the Kelai. The whole journey has taken about two months; they



Map 2 KECAMANTAN SAMBALIUNG

have retained the name of their former village, Long Bena'. This spontaneous migration was caused by the difficult economic situation in their region of origin. In this new settlement they built traditional type housing, small longhouses of three or four doors, and also individual houses.

5. Meraang (pop. 57 KK about 350 people, 1984), 100% Islam.

A Bugis village, they don't have yet the status desa. A mosque. On the opposite bank is located a base camp of P.T. Suaran.

6. Tumbit Melayu (pop. 505, orang B nua'), 100% Islam.

7. Tumbit Dayak (pop. 194, 1938).

A traditional Mənggæ village. Now they call it Tumbit Muallaf, because the majority of the population has chosen to become muslim (masuk islam) in 1976. In fact the inhabitants are divided according to religion: Islam (161), Catholic (30), Protestant (1), others (2).<sup>14</sup>

8. Long Lanuk (pop. 209)

The largest Mənggæ village on the Kelai; there was a recent movement of conversion to Catholicism (50 people). The father Pancrazio, an Italian missionary, pays monthly visits to the village. A small church was erected in 1979. The other inhabitants are KINGMI, but there seems to be no frictions yet. One notes a Puskesmas with a mantri obat, some medicines were given recently by the Health Department.

Upstream on the right bank stands the Gunung Nyapa (Kong Nyapa' in Mənggæ) 997 m, situated in a bare area with no villages at all.

#### Kecamatan Muara Lesan

1. Merasa' (pop. 103 KK about 600 people, 1984), 100% KINGMI.

A large Kenyah village: Uma' Baka, Uma' Kulit and

few Mənggæ. The bulk of the population was formed by the Uma' Baka, established formerly at Long Gie, they moved upstream to Merasa' in 1973. The Uma' Kulit came later; they settled nearby at Muara Dalam on a tributary of the Kelai.

2. Long Keluh (pop. about 220, 1984)

The main base camp of P. T. Troyana, a Japanese-Indonesian timber company. Now there are more than 200 karyawan. A school (SD). The concession represents an area of 87,000 ha. Some inhabitants of Merasa' and Muara Lesan do work temporarily there. The monthly production is presently 7,000 m<sup>3</sup>. According to the manager 30% of the concession area was burnt in 1983 during the great fire which affected East Kalimantan. A logging road connects Long Keluh to Panaan, a Lebu village on the Lesan river.

3. Muara Lesan (pop. 633), 100% Islam.

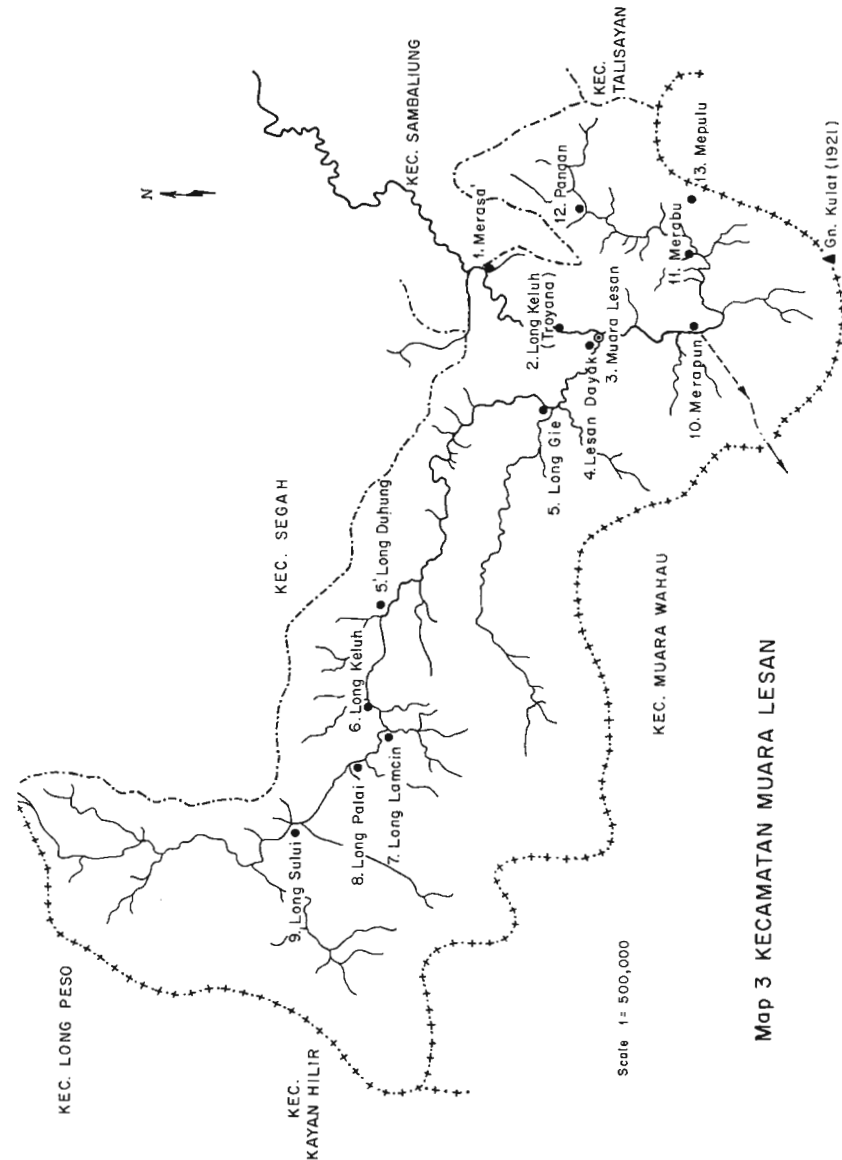
The capital village (ibukota kecamatan). All government services and schools (SD, SMP) which are also attended by Mənggæ from Lesan Dayak. As the site is frequently flooded there is a project of moving the ibukota downstream near Long Keluh this year (1985).

4. Lesan Dayak (pop. 99, 1984), 100% KINGMI

The original name of the village is Letah aya' literally "large flat area". This is the older Mənggæ settlement on the upper Kelai. Formerly the population was more important, but they have been decimated by diseases. The conversion to KINGMI dates back to 1971. Amat Kuling the present pembakal<sup>15</sup> belongs to a high aristocratic family (hepuy ngan).<sup>16</sup>

5. Long Gie (pop. 124, 1984), 100% KINGMI.

The PKMT project for the Punan Kelai was initiated in 1979-1980. Forty houses were built then of which a few are still empty. The people came originally from Long Duhung (5 on Map 3) located upriver on the Kelai. Now there has been a split, with 12 families making their swiddens upriver at Long Beliu while 4 others



Map 3 KECAMATAN MUARA LESAN

went to the Gie river at Tanjung Benua'. There is one elementary school (SD). Upriver are located four more Punan kampungs.

6. Long Keluh (Long Bui, pop. 127).
7. Long Lamcin (pop. 74).
8. Long Palai (pop. 52).
9. Long Sului (pop. 357).<sup>17</sup>

#### The Lesan River

There are only the Lebu settlements: 18

10. Merapun (pop. 282), 95% KINGMI.

They were converted as early as 1952.

11. Merabu (pop. 116), KINGMI, Islam, adat.
12. Panaan (pop. 96), 100% Islam (muallaf).

A fourth village Mapulu (13 on Map 3, pop. 120) has split up recently (1980), most of the inhabitants 16 families have left to found Tebang Ulu' on the territory of Kutai (Sangkulirang). The others settled near Merabu, at Mapulu Baru where they receive the bantuan desa (Bandes) from Berau administration.

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Vol. 18, 2e afd, 7-33 and 199-224. TAD. 1977. Population and social structure, TAD report no 8, Samarinda, 1977. Whittier (H.L.) Social organization and symbols of social differentiation: an ethnographic study of the Kenyah Dayak of East Kalimantan. Ph.D. Michigan University. 1974. "The distribution of Punan in East Kalimantan", BRB, Vol. 6(2):42-48.

#### NOTES

1. Daily flights connect Tanjung Redeb to Samarinda (Merpati or Bouraq, 55,000 rp single ticket in 84). Tanjung Redeb is a small quiet town with a population of 15,000. There is also a boat every two weeks from Samarinda. The basic staples (bahan pokok) cost nearly the same as in Samarinda or Tenggarong.
2. Dwall, 1855:446-455.
3. Spaan, 1901:25.
4. The Uma' Baka are also found on the Apo Kayan (Long Marung, kecamatan Kayan Hilir) and at Long Telenjau mixed with Kayan on the lower Kayan river (Whittier, 1983:19, 236).
5. They are rather different physically from the other Punan groups, larger and more strongly built. One can suppose that they were also a Modang sub-group which has shifted to hunting and gathering following some particular event. Linguistically the Punan Kelai belong to the Modang group as the Mənggəc but opposed to the Modang (solects in Kutai (Long Glit, Long Bleh, Long Way, Wəhca) these languages exhibit the phoneme [tʃ], a voiceless palatal affricate, nevertheless the articulation is more pre-palatal sometimes closer to [tʃ] than to [tʃ].

Some examples:

ci' "one" (Mənggəc, Mnan)

cə' "to count" (Mənggəc)

cə' or ce' on "to be, to exist" (Mənggəc)

cun "they" (Mnan)



These isolects are mutually intelligible and also with the Modang Wəhɛa; the Mə onggaɛ call the later Sawaw, literally, "they from the Wahau".

	M ngga	Mnan	W h a
left	mənliɑ'	mənlih	(m n) luy
to arrive	towaw'	tawo'	hay
skin	las	laés	laés
blood	həlha	lə'a	ləha'
dog	kles	asaw	tlug
mouse	əwaw	əwaw	əwɛa
meat	sɛn	sɛn	sɛn
bone	tleaŋ	taləŋ	tluaŋ

6. Whittier, 1974:46

7. Basap seems to be an exonym given by the coastal Malays to different hunter-gatherer groups in the Sangkulirang - Bengalon area in Kutai and Talisayan in Berau. The two Lebu dialects are mutually intelligible. However they are differentiated to a certain extent:

	Inaran	Merapun
house	kopol	ləpbo
there	pi'u	kékəma
hand	təñu	taŋan
cold	a'lemɛk	lancit
foot	katig	tonaŋ
to sit	narug	dudu'
red	abərɾa	marəŋ
to go up	tumaŋas	namik

But the Lbu language (rangɛt Ləpbo) shows also phonological variations for cognate terms:

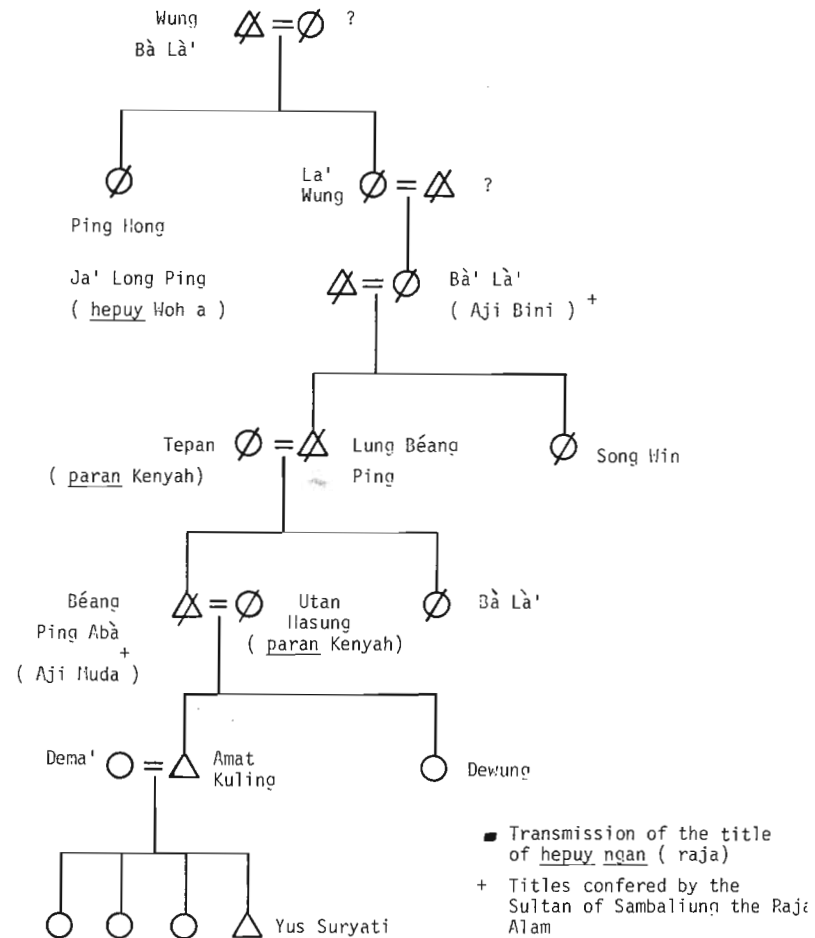
dog	asso	asu'
blow-pipe	səput	səputan
rattan	uway	uwɛ
head	puru	təkuru'
shoulder	a'bəha	bara
to cook	anapu	nəpu
roof	sapaw	sapo
white	punti	putɛ'

8. According to Dewall the Basap were collecting birds nest as a tribute to Tanjung (Sambaliung) while the Punan Segah were doing the same for Gunung Tabu (Dewall, 1855:453-454).
9. Dewall, ibid:447.
10. In 1982 the total population was 44, 938 inhabitant for 32,697 sq. km. (Kabupaten Berau dalam angka 1983:14).
11. The villages of kecamatan Sambaliung are listed starting after Tanjung Redeb on the Kelai river (Map 2), the other villages downstream are excluded. The kota Sambaliung has a population of 967, 100% Islam orang Bənuɑ', Bugis, Javanese, etc., it is situated on the right bank of the Kelai opposite Tanjung Redeb; population figures are for 1982, except if it is stated otherwise.
12. The PKMT (Pengembangan Kesejahteraan Masyarakat Terasing) program is specially directed toward former hunter-gatherers, it is funded by the Social Department on a national level, whereas RESPEN or RESDES program are partly funded by the regional government (see TAD, 1977:81-82).
13. See the report on this project (Proyek PKMT Inaran, 1981:8-9).
14. The Kepala adat and his wife were unwilling to change their faith.
15. Pembakal is the local Berau term for village chief, it corresponds to petinggi in Kutai.

16. The genealogy of the hepuy Mənggæc of Letah aya' (formerly Long Lesan) shows some intermarriage with Modang Wəhɬa and Kenyah Uma' Baka:

Spaan gives some information on the Mənggæc villages on the Kelai around 1900, but the situation has changed completely since then. According to his data the Kenyah were already settled on the upper Kelai (Spaan 1901:20-26). He mentions that Ijok Lih Ping (Pangeran Prabu) was then the raja of the Segai Kampung of Muara Lesan and also raja of the Kelai Segai.

17. Formerly the Punan Kelai were direct vassals of the Mənggæc of Long Lesan but it is not the case anymore. After the drop in Mənggæc population and the Kenyah arrival at Long Gie their influence was challenged and the Punan have grown more independent. Unfortunately Dewall says next to nothing concerning the Punan Kelai (Dewall, *ibid*:435, 451), and Spaan is not really precise (Spaan, *ibid*:27). The only source for the contemporary period is Simandjuntak's *skripsi* (1967); but since there have been drastic changes, now the Punan have started planting rice with poor results, and they were converted to KINGMI (in 1978-79). Presently the Long Sului group is under the influence of Malay merchants (pedagang) from Tanjung, they bring all sorts of goods to the Punan in exchange for jungle products: rattan, gaharu, damar, etc. It seems that the barter rates are not really fair and in consequence the Punan contract huge debts which they can't refund. There is no government control on the exchanges. Simandjuntak points out that under Dutch rule the exchanges were supervised by government officials (Simandjuntak 1967:43). According to an informant, in Long Sului some of the adat is still carried out, like the traditional therapeutic rituals (ujin) and sago (blung nanga') remains the staple food as rice production is very low. Hunting and gathering are important. Work teams (bebe') perform many of the tasks.



18. Till the end of the 1920s, the Modang Wəhəa were taking heads in the Lebu area. Skirmishes were common (Dewall, idib:454). Now a few Modang have married in Merapun and live there. Often the Lebu people travel to Miaw Baru, the Kayan Uma' Lekan village on the Wahau river, to sell jungle products like the tree sap (ketipey) used to fix the parang blade on the handle. The journey takes about one day on foot through the forest. The Lebu are good hunters with the blow-pipe (seputan) but they also cultivate rice, coffee and maize. Usually they don't weed their swiddens.

The Lebu have no system of social stratification. The village chief is elected and they have never known the longhouse either. In fact they live in small individual houses with bark atap and walls, which stand for 7-8 years. Urgent research is needed on the Lebu, especially the Merabu group which has retained some of the adat, the harvest festival (tuak), and the curing ceremony (nobet). They do have an intermediate economy and their material culture is quite unique in the area.

#### ORANGUTAN RESEARCH IN BORNEO1

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After receiving funding from the L.S.B. Leakey Foundation in April, 1982, for my research project on free-ranging orangutans, it was another 13 months before I obtained my visa. I arrived at the Tanjung Puting Reserve, Kalimantan Tengah, in June, 1983. Immediately upon landing from the slow boat that brought me to the Orangutan Research and Conservation Project, directed by Dr. Birute Galdikas, I found myself face to face with an orangutan. Unfortunately, wild orangutans are not so easy to find; this was one of the rehabilitants which frequently sleep along the bridge that runs from the river

to camp. The first months there were spent gathering general information about the two populations of orangutans, wild and rehabilitant, and about the study area. This progress report covers the period from June through December, 1983.

The main thrust of my research project is the development of object manipulations in wild orangutans. After initial observations, I prepared a field manual and finalized my data collection methods. Observations were made on the manner in which infant and juvenile orangutans interact with all the objects they encounter - branches, fruit, flowers and whole trees. The complexity ranking of these manipulations is based on the Piagetian theory derived from observations of children primarily up to the age of two years.

The quantitative data from this study have yet to be totally extracted from the collected naturalistic observations of seven wild mother-offspring pairs, three of which were followed a second time three to five months later. Observations totaled almost 300 hours and spanned 32 different days of which 26 were whole days. Whole day follows means that the pair was followed from the time mother and offspring departed from the nest in early morning until it built and entered another nest for the night.

It is clear that manipulative behaviors most frequently observed in wild orangutans between the ages of three and eight year include the following: 1) Single actions such as grasping or waving a branch; 2) goal-directed behaviors such as intentional releases of objects (as seen, for example, when the peel of a fruit is removed within the mouth and looked at on the lower lip before it is dropped), and use of available means to obtain a desired object (the bending inwards of a branch from the stem, for example, in order to obtain the fruit on the far end); 3) multiple actions directed toward a single object (detaching a branch, for example, waving it, taking pieces off with the mouth, etc.). In addition, behaviors indicative of more complex cognitive functioning were also observed, but to a much lesser extent. These more complex manipulations include the following: 1) Complex relations which consist of manipulating at least two objects in a

specific relationship to each other. For example, during the eating of lurangan fruit, usually more than one piece is taken from the tree branch and held in the hand. Then the open palm holding the fruit is repeatedly rubbed against either the back of the other hand, the arm or foot, or a branch (thus involving yet another object in the functional complex). This action removes the many small and sticky burrs on the outside of the fruit. 2) Experimentation consists of the repetition of actions on objects with graduated variations each time, usually to attain some not easily reached goal or some not easily accomplished activity. This occurs most often during the orangutans' search for termites or locomotion between trees. 3) Object-force relations which consist of manipulating an object in relation to forces such as gravity. For example, in the crossing of a gap between two trees, a third tree is utilized. The orangutan may throw its weight forward and slightly upward toward the more flexible parts of the third tree, effecting a slow crossing of the gap.

On a few occasions even more complex cognitive processing occurs, evidenced by planning, a period of mental activity prior to overt action.

In addition, Dr. Galdikas and I agreed to an adjunct project - the observation of food-sharing among the rehabilitant orangutan mothers and off-spring. This involves videotaping food-sharing interaction every month for microanalysis in the States.

#### NOTE

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## BRUNEI MALAY TRADITIONAL ETHNO-VETERINARY PRACTICE

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Humans live in a world of constant interaction with the environment. One aspect of this interaction is the relationship of humans to animals. From the human perspective the relationship with animals is either a neutral one, be and let be, a negative one, "pests and dangers," or a positive one, animals provide benefit to humans and so are tended and given veterinary care.

Each human culture has distinct concepts and attitudes regarding animals. An inherent conflict lies in the fact that animals are cared for, yet their intended fate may be slaughter at human hands. A given culture's resolution of this conflict will be predicated upon the larger worldview of that culture, a worldview which encompasses attitudes regarding the over-all environmental setting of humans and the larger nature of the universe. These overarching concepts significantly pattern and motivate the details of daily human interaction with the environment, including animals. Thus a ceaseless interaction occurs between the minutiae of daily life and concepts of the cosmic.

### Ethno-Veterinary

Ethno-veterinary care falls within the positive aspect of human-animal relationships. The animals tended and cared for are usually domesticated ones, but there are exceptions, such as farmed fish, molluscs and crustaceans. A consideration of the ethno-veterinary for a given culture must examine both the details of animal handling and management and the relevant larger cultural framework. This will be exemplified through a description of ethno-veterinary care among the Brunei Malays.<sup>1</sup>

As a preliminary background it is useful to consider the meaning of the term "ethno-veterinary" itself. "Ethno-" is a frequently occurring combining form, found

in such terms as "ethno-medicine," "ethno-botany," and "ethno-biology." According to the Oxford English Dictionary (1933), ethno- derives from the Greek ethnos, meaning "nation;" ethno- first appeared in its present use as a combining form with the appearance of the word "ethnography" in 1834, followed by "ethnology" in 1842. More extended use of ethno- as a compounding element began with "ethnomaniac," "one who is crazy about the right of nationalities," (op. cit. p. 314) in 1863, and "ethnopsychology" in 1886.<sup>2</sup>

The term "veterinarian" has a longer history, first occurring in 1646. The Oxford English Dictionary (1933, p. 166) defines it as, "One who is skilled in, or professionally occupied with, the medical and surgical treatment of cattle and domestic animals; a veterinary surgeon." Both "veterinarian" and "veterinary" (first usage 1791) derive from the Latin veterinarius, veterinus, "belonging or pertaining to cattle" (op. cit., p. 166).<sup>3</sup>

Current usage has extended the meanings of both veterinary and ethno- beyond their original scope.<sup>4</sup> Thus, "ethno-veterinary" can be defined as: all traditions of medical and health care for animals other than that of modern Western scientific medicine.

The modern field of veterinary medicine reaches broad horizons, as Schwabe (1984, p. 1) points out:

Defining it as the field concerned with health and disease among nonhuman animals indicates its professional directions and immediate relations. Equating it with pathological zoology suggests more clearly its overall scientific dimensions. Calling it comparative medicine directs attention to one unique aspect of its approach to disease which has obvious implications to human medicine. Stating that it is a branch of agriculture takes note of an historical relationship and the food and other material needs its practice helps meet. Recognizing its concerns for conservation of wild animal resources and protection of people from untoward environmental influences

identifies two areas where there are obvious cur needs to expand its considerable inputs.

Of these broad perspectives it is particularly veteri as regarding the health and fitness of animals, and care of animals as an aspect of agriculture, which will be considered here.

From the 12,000 mile winged flight of the Arctic to the clamped-down crammed-in-a-shell staidnes barnacles, all animals live at a particular time particular space. Thus knowledge of the specific environment involved is a necessary background for veteri considerations.

### The Brunei Setting

The country of Brunei lies in the humid equat tropics on the northwest of the island of Borne 114° 23' - 115° 23' East longitude and 4° -5°5' N latitude. The data presented here were gathered Temburong, the northern part of the country, or alluvial-plain farming area situated between coastal sw and the interior mountains where the highest pe Bukit Pagon, reaches 6,070 feet. Parts of the inte receive over 150" of rain per year. The annual ext range of temperature is 73°F to 89°F or higher, relative humidity fluctuates, on the average, between and 91% (Brunei Annual Report, 1976). The rainy se occurs during the southwest monsoon, the period of Jul September; the cool and dry season comes during northeast monsoon, from October to February; while the and dry season lasts from March to June. The " seasons here are not the baking aridity associated the classical dry season in India (Leong, 1974), ratl they are times of less rain with interspersed dry sp These dry periods are vital for successful production the staple rice crop. Burning over the cleared fi prior to planting requires a dry spell, as does the ripening and harvest.

One of the main rivers of Temburong is Fire F River. Only proboscis monkeys and other animals inh the peat and mangrove forests on the lower reaches of river. A sparse population, predominantly Murut, fa

the steep hills in the upper reaches of the river, where mixed dipterocarp and montaine forest often extends right down to the water. The largest population lives on the flat alluvium found on both sides of the middle reaches of Fire Rock River, an area originally containing heath and mixed dipterocarp forest. Now largely cleared over, the area is farmed by Brunei Malays, Kadayans, Muruts, Ibans, and a few Chinese. The staple diet for all these groups consists of fish and rice.

People on the upper reaches of Fire Rock River grow hill rice in the classic slash-and-burn pattern (Webster and Wilson, 1966). They clear new fields annually, sometimes on hillsides with a slope of 45° or more. Dry rice is grown on the alluvial soil of the middle reaches as part of the Malay pattern of agriculture which also includes cultivation of yams and taro combined with the use of the sago palm (Grigg 1974). In essence, this is slash-and-burn rice farming on level ground. Although dikes are built in some areas so that accumulated rain-water will flood the fields, nevertheless it is dry rice which is grown, not swamp rice. Dry rice growing does not involve the elaborate controlled irrigation and preparation used in wet-rice growing. Also, the water buffalo is not used as a draft animal.

Prior to the twentieth century the middle reaches of Fire Rock River were the exclusive domain of longhouse-dwelling Muruts. After epidemic disease decimated the Muruts in the early part of the present century the nearly empty territory served as a migration magnet (Tweddell and Kimball, 1985) which attracted Brunei Malays, Kadayans,<sup>5</sup> Chinese, and Europeans, along with rubber estates, to the area. The hub of this settlement was Fire Rock Village, founded on the site of a former Murut longhouse.<sup>6</sup>

The Kadayans were by tradition rice farmers. For several centuries their ancestors lived in the hinterlands surrounding Bruneitown (the old name for present-day Bandar Seri Begawan) and provided food for the town.<sup>7</sup> The Brunei Malays lived in the town and did not farm; they were the rulers, craftsmen, fishermen, merchants and overseas traders. Only a strong combination of socio-historical events and stark economic circumstances could have led to what eventuated: in the post World War I

period a number of Brunei Malay families moved into Temburong and commenced farming. They learned the "practical" techniques of farming from the Muruts, and the "magical" practices of farming from the Kadayans. In their kampong ayer Water Village houses in Bruneitown, the Brunei Malays raised no animals except for cats, some chickens, and a few pet birds. Raising of food animals was a Kadayan enterprise. As a result, the Brunei Malays who began farming on the middle reaches of Fire Rock River had exceedingly limited experience of animal husbandry and the associated veterinary practice. They learned animal husbandry through a combination of trial-and-error plus information gleaned from Kadayans and Muruts.

Despite the difficulties involved, quite a few Brunei Malay families succeeded as farmers, enjoying comparative prosperity through the mid-seventies. They raised rice, taro, and yams for the starch staple, and kept vegetable gardens and fruit trees. They also raised cows, water buffalo, chickens, goats, ducks and geese for home consumption and to be sold. One farmer compared cattle and water buffalo to money in the bank, saying that they could be sold when it was necessary to raise cash.<sup>8</sup> Poultry and goats were sold locally, or eaten at home.

Since the mid 1970s farming has become increasingly untenable as a livelihood.<sup>9</sup> Many families no longer grow rice.<sup>10</sup> The cattle and water buffalo population has decreased because Bandar Seri Begawan meat-dealers no longer buy in Fire Rock Village; now the animals are sold only within the district to people having a wedding or holding some other large feast. There is no longer a market for poultry sales, and the rapid rise in the price of chicken feed has made raising chickens for sale unprofitable. The human outworking of this is that the younger generation of Brunei Malays is not continuing to farm, rather, they seek wage jobs in Bandar Seri Begawan or elsewhere. Gradually Fire Rock Village is depopulating and one day may vanish. Meanwhile, life continues on in the diminished village.

The setting of Brunei Malay daily life is a house built alongside the river, 10-30' from shore. The house is elevated 8' above the ground on stilts, and is entered by a ladder or stairway.<sup>11</sup> The river serves as a water

source, washing area, toilet, garbage dump, and transportation artery. Brunei Malays in Temburong maintain regular contact with each other and with their relatives in Bandar Seri Bagawan. Moslem by religion, they speak the Brunei Malay language.<sup>12</sup>

A basic principle of life is that anything which is remote is dangerous, be it strangers, geographic locale, or the unknown. The more remote or distant the more dangerous, the only comparatively safe haven is the close and known, close family, local area, the well-known. Before going on a journey to a remote, and hence dangerous area, or before venturing into a dangerous situation such as dealing with angry bulls or arguing people, a man or woman recites the "Peaceful Trip" for protection against peril.

In the name of Allah the Gracious the Merciful.  
Peace be unto you, peace.  
Four steps four standing  
Open door of the earth  
Kul anas ru, come out from the door  
Early mulki lam taru,  
Immune from all jin's intentions  
And men have no peril.  
There is no peril at all.  
If there is no permission.  
(Kimball, 1979, p. 184)

As a general rule, it is men who deal with the outside world where danger lies, because they have an inherent "strength." The world of women is the domestic one of home.

The outworking of this for inhabitants of Fire Rock Village on Fire Rock River in Temburong is that only men go into the jungle. Malay men usually refuse to enter the jungle, saying it is too dangerous; but Murut men often go there. Only men do the cutting for slash-and-burn fields, and only men make boat trips to Bandar Seri Begawan alone, though even a man prefers not to go alone. The realities of farmwork mean that women often cannot stay close to the house, they must tend small animals or a fishpond, garden and go to distant ricefields.

## Animals

Animals form a part of village reality. It is so that when frogs croak they are requesting rain. And the abundance of a certain type of small winged insect is thought to indicate that a flood is coming. Geckos are wanted in the house and in animals shelters because they eat insects. This is so even though legend recounts that geckos are bad; once some followers of the Prophet Muhammad were hiding in a cave, but the gecko's cry revealed their hiding place to their enemies. On the other hand poisonous lizards in a house or animal shelter must be destroyed. In general, the valuation of animals follows the pattern that the known is viewed positive while the more remote is seen as dangerous. Exceptions to this relate to specific features of Brunei Malay worldview or to particular characteristics of the animals concerned such as familiar but dangerous poison lizards.

Domestic animals are viewed positively, except the ritually filthy pig and dog. Familiar local wild animals that do no harm are considered neutral, for example, the beautiful blue herons that fish in the river. Local wild animals which cause harm are considered negative, foremost of these is the crocodile. And jungle animals, such as bear or cloud leopard, are considered negative; but avoiding them is easy, stay out of the jungle.

Who are animals? In the traditional Brunei Malay view birds, mammals, reptiles, and fish are animals. Ants, snails, insects and such are like things. The clear distinction appears in their fates after death.

Moslems can eat only food which is permissible. This includes fresh fish, shrimp, crabs, and mollusks. But turtles are forbidden. The common domestic foods consumed are chickens, ducks, and geese. Puni (a wild dove) and some other wild birds are also eaten. All birds must be live, then properly slaughtered by being pricked over and having their throats slit. Pork is absolutely prohibited.<sup>13</sup> The usual domestic mammals consumed are cattle, water buffalo, and goat. When available the wild deer and mousedeer provide a treat. Again, the animal

must be ritually slaughtered by being prayed over and having their throats slit.

Many houses have pet cats. But dogs are considered foul and seldom kept.

After death animals which have been slaughtered properly in accordance with Muslim law, and are therefore halal, permissible to eat, go to heaven. Dogs, pigs, snakes and monkeys as well as animals which have not been properly slaughtered in accordance with muslim law, and are therefore haram, forbidden to eat, go to hell. Cats are good, so they go to heaven at death; fish also go to heaven because they cause no trouble. Birds enter heaven because they know how to repeat a sentence praising Allah, their Lord. Good animals can stop on the edge of heaven. Animals have one soul, roh-roh, and one life.

Ants do know how to bow before rajas, but ants, snails and such are rather like things, they do not really have a spirit, so heaven and hell do not apply to their deaths. Plants have no spirit, hence the phrase "plants live" is a manner of speaking, it is a different kind of life from that of animals. The two exceptions to this are rice and sago, plants which do have spirits, semangat; the reason for this is that they originated from animals.

Humans, of course, have both souls and spirits and will go to either heaven or hell at death. During life humans seek the wellbeing of their domesticates, and seek to avoid or repel animals viewed negatively.

Dukun, traditional medical practitioners, provide care for both humans and animals. Veterinary care for animals in some ways parallels medical care for humans, as when a sick calf is fed a tonic also taken by humans. Yet it also parallels the repelling of negative animals, as in the repulsion of crocodiles who might eat livestock.

#### Animal Care

The broadest aspect of Brunei Malay veterinary care for animals involves providing a setting favorable to their well-being, yet simultaneously managing them by containment. Provision of adequate shelter, food and

water as well as reasonable safety from hazards are also important. But the details of how this is done vary according to the animal type.

Karbau, water buffalo, need to loll in mud and tolerate heat poorly. Several families run their water buffalo jointly in a large area bounded on three sides by water and on one by a fence. These buffalo are wild; catching one for slaughter necessitates using bait to entice it into a strong trap-pen.<sup>14</sup> The available pasturage and water are adequate, while an open-sided roofed-in area provides shelter. The water buffalo roam about at all hours, and generally stay fairly healthy.

Occasionally a water buffalo is caught and tamed. The farmer puts a ring through the water buffalo's nose and attaches a rope to the ring. This tame animal likes to be petted and scratched. Petting is more than just fondness, though that is a factor. The water buffalo becomes accustomed to those who pet it regularly, submits docily to being led by them, and to some degree responds to their vocal and kinesic commands. These commands are basically of two types, shooing the animal away or getting it to stay still so a human can pick up the nose-ring rope to lead the animal somewhere. When kept around the yard but out of the garden the water buffalo serves as a natural lawn-mower. At night the tame buffalo is housed under a shelter with a smudge-fire to keep off mosquitoes, and in general leads a pampered life. Family members automatically keep track of the tame water buffalo's whereabouts, and hunt for it if they lose track of it.

Cattle have more heat-tolerance than water buffalo but are less hardy in other respects. They need a roofed shelter walled-in on three sides, and a smudge-fire must be built for cattle every night or the mosquito bites will literally drive them mad. Cattle need reasonably good forage, and a supply of clean fresh water. The agricultural extension service urged and helped some farmers to raise good grass in a fenced-enclosure, then to control the amount of grazing on it. The farmers appreciated the benefits of the grass for the cattle, but decided that, all things considered, the resultant benefit was not worth the constant work and expense involved, and reverted to letting the cattle forage for themselves in a



somewhat overgrazed area. Since cattle are prone to stumble over things or into things (such as ditches) and break their legs, their surroundings need to be fairly level and hazard-free. Cattle are also rather disease-prone. A sick cow or calf may be given a treatment similar to that used for humans. A dukun recites the "Neutralizing Harm" verse thrice:

In the name of Allah the Gracious the merciful,  
 In the name of Allah of Neutrality  
 Praise be to Allah of Neutrality  
 Neutralize all the world  
 My neutralizer is for all that is Harm  
 Descend all Harm  
 Ascend all Neutrality.

(Kimball, 1979, p. 152)

then blows it into a bucket of water, and uses the water to give the animal a ritual bath.

Occasionally an orphaned or lame calf will be kept near the house as a pet. One such was Si Tinggal, the "left-behind one," an orphan calf which was bottle-fed. He became addicted to highly sugared coffee, knew his name and would come running for coffee and petting. At two years old he was a young ox running with the cattle herd, but still came running at the sound of his name, slurped up coffee, and held his head up for petting; and he still nudged the petter gently when he wanted more. While petting with one hand the petter would use the other to remove ticks and burrs from Si Tinggal's hide.

Goats need fully enclosed shelter, preferably elevated on stilts above the ground to keep out the damp and predators. Because of their small size, goats are more prone to predation by crocodiles and snakes than are cattle and water buffalo. Goats prefer succulent greens but can eat tough browse if need be. To minimize predation, including human thievery, goats are sometimes kept in a ground-level shelter only 50' or so from the house. They will then try to munch their way through the garden, demolish the dinner greens, and in general make a nuisance of themselves. Goats are considered ornery, somewhat stupid, and, when the males get into rut, bawdily

humorous. Goats are often quite tame, but they are not considered pets.

It is recognized that each individual cattle, water buffalo, or goat has a distinctive personality. In dealing with the animal one must figure out this personality and treat the individual animal accordingly. Of course, the animal has behavioral features generic to its kind, for example: look for the lost water buffalo first in the fishpond; hunt for goats in the garden; and the cow has probably wandered off down the path.

The most commonly raised poultry are chickens. They need to be cooped up at night for protection against the elements, wild animals, and thieves. Chickens need abundant water or they will die. A farmer seriously intending to increase flock size will purchase two-day old chicks in Bandar Seri Begawan. They are then raised in a special pen elevated 3' off the ground. A kerosene lamp provides light at night. When the chicks are about three weeks old they are let out to roam around in the afternoon, but return to their pen at night. When the chickens have reached early maturity they are placed in a regular chicken coop, spending their day scratching around for food and returning to the coop at nightfall. Village hens will make nests and hatch eggs; a charming sight enjoyed by all is the parade of baby chicks following behind their mother. Unfortunately, the mortality rate of these chicks often reaches 90% or more. Hawks, snakes, rogue cats, and other predators account for some. A disease described after its presenting symptoms as "drippy eye" claims many. If they survive the first month chickens have a good life expectancy unless an epidemic strikes. Chickens are fed first thing in the morning, otherwise they will peck one of their flockmates to death. Brunei Malays know that chickens fed on white rice sicken, but chickens fed on rice still in the hull are in good condition, have a red face and do not get sick too much. Chickens fed on corn become fatty. Table scraps form a part of local chickens' diet. Farmers consider it important that chickens scratch around for insects and other edibles, they need both the food and the exercise. Some villagers have seen the new battery raising poultry farms. They comment that such cooping is cruel, "How would you like to be stuck all your life in

a cage?" This battery-raising is pointed out as being one of the modern things which contravenes nature, "the way things ought to be," and is making the world worse. Villagers observe that there seem to be more chicken diseases erupting now than there were in the past. Also, they observe that it is not good to raise chickens in the seventh month because then there is a lot of sickness. No one makes pets of chickens.

Some people raise ducks. Ducks need a pond to swim in and a protected coop to stay in at night. The coop must be elevated off the ground to prevent predation and to prevent night dampness from causing illness. Ducks are fed table-scrap. One family built a duck-house over their fishpond so that duck droppings could fertilize the pond. But ducks leave messy droppings everywhere, and most people do not bother to raise ducks.

Geese provide a good alarm system. They also nip guests and scare children. Geese are hardy and good at fending for themselves, needing only an enclosed shelter to protect them from nocturnal predators. They are fed once a day to keep them tame. As of 1983 only one family in the village had geese.

The Fire Rock River usually runs fresh, at least at low tide. But after a long dry spell the water becomes brackish, humans and animals alike will sicken if they drink it. When the river runs brackish, villagers must boat two miles upstream to springs located in the hills. These springs always run fresh and do not dry up. Villagers fill containers with fresh water for human consumption, for watering livestock, and for watering crops.

Dry spells can also play havoc with fishponds. Fish-farming involves the construction of a pond, planting it with grasses fish favor, then stocking it. Villagers buy fish in the city or obtain them through the agricultural extension service. One of the principal fish stocked is the grass carp which is hardy, grows fast, and tastes good for dinner. Fish may die from illness, predation, or deteriorating pond conditions. In 1983 fish farming had become untenable because biawak, a type of gerbil, made forays by day and night, decimating the pond fish popula-

tion. Prior to that pond fish were a significant dietary item. Left-over scraps from meals are thrown into the pond as fish-food. Villagers recognize that fish may suffer ailments; they point to tumors on wild or raised fish as an instance of illness, and will reject such a fish as unclean for human consumption. An indigenous Murut fishing technique used tuba poison to suffocate fish in rivers. Both from seeing this technique used, and from pond experience, villagers recognize that fish coming to the top and seeming to gasp for air are in distress, though there is no remedy. Pond fish like to hide in the shade of grasses near the bank because, villagers say, "The shade feels good on a hot day." Building a fishpond entails major expense and a large amount of work. Only a few families have fish ponds.

Most Malay homes do not have a dog, because dogs are considered unclean.<sup>15</sup> A few isolated Malay homes do keep a dog for protection, and many non-Malays keep dogs.<sup>16</sup> Dogs are fed and watered, and prodded with a long stick, but are not petted or handled.

Every Malay home has a cat. Obviously cats keep down mice and rats. But an equally important reason for keeping cats is that cats can see in the dark and so are believed to know when evil disease-causing hantu spirits are lurking about at night. The cat's meowing gives warning that hantu are around, and hantu know that cats are revealing their presence, so they (hantu) avoid houses with cats. Thus cats are perceived as performing a preventive medical service for humans. The ordinary village cat is brown-splotched with a short crooked tail. Brunei Malays value the black cat, the "cat taught by the gods," and Kadayans favor the rare calico. A black cat crossing one's path means good luck for that day. Cats are fed on cooked left-overs and are provided with water. Villagers do not let cats eat too much raw fish because they will sicken and vomit.<sup>17</sup> Cats are expected to supplement their diet by catching mice and rats; cats which are lazy and merely steal food from the kitchen instead of rodent-hunting will be taken to a remote locale and set free.<sup>18</sup> A cat which wanders in is given a chance to prove himself or herself, and may become a part of the family. Cats are treated well, and all house cats are in effect pets.

Cats can get sick. Some cats giving birth "do not know how to do it right," and drop kittens hither and yon; these kittens must be put into a prepared snug location and the mother cat brought there. Tomcats often receive injuries in fights, and such injuries frequently become infected. Children find cats amusing play things. This means that sometimes cats receive rough handling. One four year old boy wrapped rubber bands around a cat's paws; the paws swelled and the cat went meowing to an adult family member who figured out what the problem was and removed the rubber bands. Perhaps surprisingly, the cat did not run away when the boy wanted to play with it again the next day. The intimate association of child and cat, and indeed of all humans and cats, means frequent human exposure to any feline-borne parasite or illness. Also, one might speculate that individuals with severe cat allergies die of them in infancy.

Cats are viewed as animals, but ones which stand in a special relationship to humans. If the family cats seem anxious and uneasy, meowing and pacing as though to give warning, humans take special note. The other side of this is that humans are attuned to feline illness and malaise. Yet it is recognized that cats go their own way and disdain human help, so generally speaking no veterinary care is attempted beyond placing the cat in a warm dry location, often on an old piece of cloth in a box.

Cats are recognized as being individuals and are dealt with accordingly. Inevitably certain cats become special pets who receive choice handouts and special care. One such was Si Chumat, the "cute one." He was a large heavy neutered male, boss of the house and well he knew it. Raised as a pampered pet from kittenhood, Si Chumat designed to let people pet and pamper him.<sup>19</sup> But he was in the village because his owner, member of a village family but living elsewhere near his job, was afraid that jealous people would poison or steal Si Chumat.

Still a strong presence at 11, Si Chumat was an exception to the generally short life-span of village dogs and cats, few of whom live more than 5 or 6 years. Injury or illness claims many. Snake-bite is also a significant cause of mortality; the animal will return home puffed-up

and sick, and die in a few days.<sup>20</sup> Many die of unknown causes. Quite commonly cats will wander out as usual one day and never return.

A special class of animals are fighting cocks.<sup>21</sup> As Moslems the Brunei Malays cannot fight cocks and bet on them, but Iban, Murut and Chinese do. One respected village Malay dukun, traditional medical specialist, made a successful business of raising and training fighting cocks. Given daily training sessions, baths, rubdowns, special diet, and perhaps secret medicines, cocks trained by this dukun had a high rate of fight wins. But he never taught his special technique to anyone; so it died out with his passing.

#### Veterinary Care

Certain events in the life cycle of an animal involve special veterinary care. Castration of cattle is one such; this is done by members of the agricultural extension service.<sup>22</sup> Villagers do their own ringing of cattle and water buffalo. The animal is lassoed, secured to a tree, and a clean knife used to make a hole in the septum. This is enlarged with a clean peg, then the ring is put through. The ring may be a metal one or a home-made rattan one. If there happens to be some antiseptic salve in the house it is put on the animal's nose, otherwise, clean leaves are used to wipe it. An effort is made to help cows through difficult births, but these often occur at night and it is morning before anyone known about the event, by then either the birth is done or the animal is dead. A calf that is orphaned or rejected by its mother may be bottle fed.

Preventative medicine plays an important role in animal care. The fundamental Brunei Malay etiology maintains that disease is caused by evil hantu spirits. Hantu cannot tolerate the smoke from burning garlic, onion skins, or the wood of an old rice-pounding mortar. Some of these substances, especially onion skins and garlic, are put into the nightly smudge fires for cattle and tame water buffalo. Hantu also cannot tolerate certain amulets, so these are placed at the four corners of the animal shelter. Sometimes cats are encouraged to live near an animal shelter as a further protection against

hantu and to serve as mousers. The provision of proper food, water, shelter, and general living environment for animals is recognized as a factor in preventive care.

Yet no matter how good the ongoing care that is given, veterinary crises do arise. Most devastating is disease epidemic. One year hemorrhagic septicemia decimated the cattle. People knew there was an epidemic and felt that the agricultural extension service ignored it. But even after the illness was diagnosed by a veterinarian neither traditional nor modern veterinary medicine could help. Another time a poultry disease wiped out all the chickens. When an epidemic appears preventative efforts may include placing bitter inggu medicine around the animal shelters and even smearing it onto the animals. But people say, "There is really nothing you can do, everything will be lost, that is all."

Villagers recognize several signs that indicate an animal is ill. Often the first clue is a change in behavior, such as loss of appetite, droopiness, or an animal withdrawing into itself. Obvious signs such as exuvia from eyes or nostrils indicate illness, as does coughing, wheezing, or abnormal breathing. Farmers touch the noses of cattle, water buffalo, goats and cats to feel for any abnormality indicating illness. If the weather has been cold and wet, extremely hot and dry, highly variable, or unusual in some way, farmers are on the alert for the signs of illness which they maintain such weather causes in both humans and animals.

The presence of animal disease sets off an immediate response. Farmers make efforts to treat the sick animal by using procedures similar to those applied to humans. Often they attempt to administer a tonic orally. A favored tonic is inggu, which disease-causing hantu fear. Ingg consists of bitter aloe-extract jadam medicine mixed with water. Ingg and other tonics taste horrendous, so it is little wonder that efforts to get them down an animal often fail. The farmer also recites any prayer or treatment verse he or she knows onto the animal; or a dukun may be summoned to recite curing verses, in this case the Neutralizing Harm will be used, as well as any special veterinary verses the dukun might know.

Meanwhile a close watch is kept on the other animals to catch premonitory signs that the illness is spreading. If the animal sickens dramatically, or there is an indication of the illness spreading, efforts are made to have the agriculture extension service come in to deal with the problem. The agricultural extension service veterinary treatment is usually by injection, occasionally by pills which can sometimes be forced down the animal. Many times nothing can be done. Then there is a shrug of resignation as an acceptance of hard reality.<sup>23</sup>

Injury presents a different problem. Feline cuts and scratches may receive application of salves used for human cuts. When a bull fell into a ditch and refused to get up despite the help of several men in lifting him, the decision was taken to slaughter the bull in order to salvage the meat. This was done although it was already nightfall; in an area without electricity this meant working by flashlight and kerosene lamp and an all night cooking session over a wood fire to preserve the meat.

The relationship of a domestic food animal to humans begins when the animal is born, or is acquired through barter or purchase. It ends either with the sale or barter of the animal, or its death either through natural causes or through slaughtering for meat. Cats, on the other hand, wander in and out of human lives in their own feline way.

### Slaughtering

Both men and women catch pond and river fish for food. But it is men who slaughter animals. Usually the eldest male present does the slaughtering, for by virtue of having lived the longest he has the greatest "strength" of any man present. Should there be no adult male present a woman may slaughter a wild puni dove or a domestic chicken; but she will not kill any other animal. Virtually all men kill chickens.<sup>24</sup> Many do not like to cut ducks or geese because they take so long to die. And some men are reluctant to slaughter goats. Only a few men, however, venture to slaughter cattle or water buffalo. Such a large animal is "strong," its spirit is strong, and the taking of such a strong spirit leaves a temporary

small dangerous emptiness in the world. Great care and deliberation surround the act.<sup>25</sup>

Early in the morning the slaughterer sharpens his pamarang, a 3' long slightly curved bush-knife, and hones it until it could literally split a hair lengthwise. After the animal has been caught and thrown, the slaughterer, often muddy from the capturing and throwing of the animal, washes up while helpers complete trussing the animal and dig a blood-catchment pit in front of its throat. After putting a prayer cap on his head the slaughterer steps up to the animal and prays with thoughtful care. He then steps onto the animal's neck and quickly slices through to the backbone. He then steps down and moves some distance away, there to sit or squat and watch until the animal is dead. Many men, who may have been bravely courageous helpers in catching and trussing the animal, cannot stand to see the actual killing and will turn away or go off some distance until death has come. During the skinning and dressing of the animal workers inspect to be sure the meat is sound and healthy, and so halal, permissible.

Because the animal is about to die, it is handled as kindly as possible during capture and trussing. Sometimes people will murmur, "Don't be afraid, you are going to go to heaven."

### Pests

The converse of this treatment of food animals on their way to heaven is the management of "pests," which are seen as a threat to humans and animals. Chasing away dogs by throwing things at them or threatening to hit them with sticks is a normal mode of behavior condoned, when thought about at all, because dogs are unclean.

In the past, predatory monkeys, Rhesus macaques, were shot. Since 1963 the private possession of firearms has been prohibited and monkeys constitute a major crop pest, blithely raiding fruit trees and munching garden delicacies such as cucumbers. The only recourse is to chase after them, throw things at them, and make loud threatening noises; but unless they are chased far away, and

chased off repeatedly, monkeys still deprive humans of food.

Fortunately, one of the most feared pests seldom comes. These are cave bats which literally fly by the millions in a broad band reaching from horizon to horizon across the sky. If they alight on a farm they will annihilate the plants and wreak havoc by worrying the animals, often worrying them to death. Aside from trying to get the animals into shelter, and lighting protective smudge-fires, nothing can be done against massive cave-bat invasion.

A type of vampire bat may nip animals and occasionally one gets into a house. But vampires are few in number; if caught they are killed and the body thrown into the river.

Wild pigs can trample a rice field. In areas of mixed Moslem and non-Moslem population, such as Fire Rock Village, non-Moslem families with a member in the military or police will get permission for that individual to bring a rifle home to hunt wild pigs. The stated reason is to remove a crop pest, but the desire to have a wild pig feast is also a factor. In areas of all-Moslem population wild pig hunts are not held and the wild pig constitute a serious menace to the rice crop.<sup>26</sup> This causes loss of a human staple food, necessitating alternative food-obtaining strategies. Seeking alternative food sources, such as earning money to buy rice, often in combination with exploiting sago, means that humans have less time and energy available to devote to animal husbandry, a negative impact on animal well-being.

The ground around animal shelters and human houses is kept as grass-free as possible, preferably as bare earth. Thus no hiding place for snakes and scorpions exists. If ants dig a nest it is hoed up and the soil tamped down. Ants marching in a column up the side of a house or animal shelter are literally burnt up, burning fibers or burning rolled newspaper are held against the column to incinerate it.<sup>27</sup>

Leeches incite a special revulsion whether they attack humans or animals. Though animate, leeches are

classed as being rather like "things", hateful things, and are treated accordingly. Medium-sized leeches sometimes bite people who are in a fishpond driving fish into a net or people swimming in the river. The large fearsome lintah karbau, water buffalo leeches, live in water buffalo wallows and bite both water buffalo and humans.

To remove a leech rub it with kerosene or hold the end of a burning cigarette against it. To prevent infection of the bite rub on cold ash from a smoked cigarette. In stealing blood from humans or animals leeches remove the essence of life. The favored revenge is to light a fire and incinerate the leech or leeches while uttering a dire warning to other leeches that this will be their fate if they dare to attack.

Grubs may attack humans, animals, and plants. The anti-grub treatment is two-pronged. First pounded papaya shoot is mixed with a little chalk; this mixture is then put on the grub-hole to kill the grub.<sup>28</sup> For the second part of the treatment a dukun recites the "Grub Neutralizer" and blows it onto the affected animal, human, or crop.

In the name of Allah the Gracious the Merciful.  
I shall know the origin of your beginning grub  
You come from the hair between Prophet Noh's eye-  
brows,  
Do not you dare eat my sustenance,  
For if you do Allah will be angry at you  
You will never smell heaven.  
Done! Neutralized.  
Descend all Harm;  
Ascend all neutrality.

### An Overview

The "Grub Neutralizer" and the "Neutralizing Harm," are used to treat both humans and positively viewed domestic animals. These verses and the manner of their use show an ongoing interaction between daily life and cosmic concepts. The connection to Islam is obvious, as is the linkage of present-day being to the historical (or quasi-historical) Prophet Noh (Noah), and the reference to omnipotent Deity. Less obvious are certain

implied or implicit ideas. Knowing the true name or the origin of a person or creature is believed to give the person having such knowledge power over that person or creature. Thus knowing that the grub originated from the hair between Noah's eyebrows gives the dukun power over the grub. In the "Peaceful Trip" the four steps relate to the concept that the Earth is flat and had four corners, so all within the four corners will be peaceful. The "door of the Earth" refers to the concept that somewhere there is a door in the Earth, this door is the entrance to the underworld; Harm can come up out of the underworld through that door, and Neutrality may slip down through that door into the underworld. When all is well Harm is down below the Earth, and Neutrality is upon the Earth. In illness or grub-attack this ordering has become reversed, hence the command, "Descend all Harm, Ascend all Neutrality." When Harm has descended back to the underworld, and Neutrality has ascended back to the world, or, in another interpretation, when Harm has diminished to nothing and Neutrality is fully present, then the world itself has returned to its proper ordering. When treating human or animal ailments, the dukun speaks of "neutralizing" the illness, meaning to return life to its proper orderly round.

Brunei Malay veterinary medicine has a broad scope and reach, covering in some fashion most of the parameters outlined by Schwabe (1984, p. 1). Paramount is the concern with the health and disease of non-human animals. The concern is there, it is the actual coping techniques which are scanty. The Brunei Malays' recognition of parallels between human and animal ailments, for example tumors in humans, domestic animals, and fish, represents a fundamental concept of pathological zoology. Arguably the use of human treatments for animals is a simple form of comparative medicine. The care and raising of animals for food is self-evidently a branch of agriculture. Brunei Malays recognize that overfishing has depleted local riverine resources, though concern for conservation of wild animal resources was not a part of traditional village life. On the other hand, protection of humans from untoward environmental influences, especially those identified as "pests," for example insects and sparrows that attack rice, is a basic feature of practice.

Traditional Brunei Malays in the pre-World War I period did not farm. Those who moved into Fire Rock Village and began farming had little traditional veterinary practice to rely upon. What developed was a veterinary medical knowledge based on human medicine, plus whatever veterinary techniques and practices were available from Murut, Kadayan, Western, or other sources. This remains so today. When the situation is bewildering or all else fails, and this is rather often, recourse is had to the agricultural extension service.<sup>29</sup> The farmers eagerly learn what is of value to them and recognize many conditions they cannot handle but the agricultural extension service can. Farmers also recognize the preventative value of inoculations for different types of livestock and poultry, and seek to have those inoculations given. Yet in the end they say, "Humans do what they can, but life and death are the Will of Allah."

Villagers remark that although in the old days there was no agricultural extension service, neither was there the incidence of plant and animal disease found now. They attribute the perceived current higher disease rate to the fact that now too many things are artificial or go against the traditional pattern, and so are offensive to Allah. They say that the use of chemicals and modern medicines has upset the pattern of the way things should be. Even the pilgrimage to Mecca is different, observed a family who had made two pilgrimages, one in the 1950s and another in the late 1970s; now people are penned up and herded about, in some sense it does not seem to be a real pilgrimage anymore. "Yet what has happened has happened and we can't go back into the past, very likely all this is a sign that Judgment Day is nigh."

What can one do? Be diligent in prayer. Accept the new hybrid bull and hope his seed will improve the herd. Use the modern veterinary medicines and techniques because the traditional ones no longer seem to work. Accept that perhaps none of the children will carry on the family farm. Continue the daily round of farming, removing pests and caring for the wanted animals. Live in the day-to-day world here, being aware that we and animals together share the earth, knowing that to each may come sickness or injury and the need to deal with it. For animals and humans alike life is a passage through space and time,

sometimes medicine and veterinary care can help to smoothe the course of that life.

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#### NOTES

1. Unless otherwise cited, the data given here were collected during the author's fieldwork in 1969-71, supplemented by incidental observations made in the course of several subsequent social visits, the most recent in 1983.
2. It is interesting to note that the related term, "ethnic," derives from Greek ethnikos, "heathen," as well as from Greek ethnos, "nation," in the sense of

- a people." "Ethnic" was first used in 1470. (Oxford English Dictionary, 1933).
3. In sixteenth century France the term veterinaire occurred (Oxford English Dictionary, 1933).  
To put matters into perspective, the earliest documentation covering some aspects of veterinary practice comes from early Egypt and Mesopotamia, circa 300 B.C. (Schwabe, 1984).
  4. "Veterinary" today extends to cover all health care of animals.  
The combining form, ethno-, currently has a dual useage. For example, in the narrow sense "ethno-botany" means the botany of any cultural group whose intellectual tradition is not directly tied to the Western intellectual tradition or to one of the otehr maor literate intellectual traditions recognized by Western scholarship, such as those of China, India, Korea, Japan, Persia, Arabia, etc. Each of the major literatue intellectual traditions has its own intellectual constructs, such as Chinese botany; Persian botany, etc. In contrast to this is the practice of members of that culture who do not fully participate in the literate intellectual tradition; such practices are often labeled "folk." Thus Chinese medicine contrasts with Chinese folk medicine, Western scientific medicine contrasts with Western folk medicine. But there is also a broader use of the combining form ethno-; here ethno-botany, for example, means "all tradition." It is in this latter, broad sense, that ethno- is applied in the term "ethno-veterinary."
  5. The Ibans are slash-and-burn rice farmers who moved northward into Brunei in the decades following World War II.
  6. Fire Rock Village (a pseudonym) was the site of the author's fieldstudy. She was adopted by a village family and views return social visits as "going home for holidays."

7. One city meat-dealer provided an informal banking function: animals would be sold to him in batches, but he paid out only a portion of the price due. Then when the family when to the city they would go to him for money, drawing against the money owed them. To a limited extent the meat-dealer also loaned money against future purchases.
8. Over the past decade farming has become increasingly untenable economically in Temburong. Some of the contributing factors are imported Thai rice, the unavailability of labor, the introduction of battery-raised chickens, shipped frozen from Bandar Seri Begawan, and the increasing reluctance of Bandar Seri Begawan meat merchants to buy cattle and buffalo they must transport by flatboat. (There is no roat transportation link between Temburong and the capital. Although there is now a road system within Temburong, and district remains accessible from Bandar Seri Begawan only by boat or helicopter.) At the same time many traditional sharing, bartering, and working for shares, arrangements have broken down, forcing a search for the cash which farming can not provide.
9. One of life's ironies is sitting at a feast held on a farm in some of the world's better farmland and eating - imported Thai rice, frozen chickens, and canned pineapple
10. This is simply a moving onto land of the traditional Kampong Ayer, Water Village, house built on the mudflats of the river. The Temburong rivers lack mudflats suitable for building, so the houses must be sited on the shore.
11. Linguists debate whether Brunei Malay is a closely cognate separate language or a highly divergent dialect of Johore Malay, on which the Standard Malay, Bahasa Kebangsaan, is based. For present purposes Brunei Malay will be treated as though it is a separate language, without this implying acceptance of one position or the other.



12. Keeping your chest warm is considered important for health. There are no electric blankets in Fire Rock Village, but on cool mornings people may hug a warm cat to their chest as a warming up technique. Also, on cool nights cats may sneak into the house and onto or under the cover; a sleeper who rolls over onto the cats is greeted by assorted yeowls, then cats and human settle down to sleep again.
13. West Malaysians, who do use the water buffalo as a draft animal, find the idea of eating it repulsive, "How could we eat our friend who has helped us to grow rice?" (anonymous personal comment) But Fire Rock Village Brunei Malays see water buffalo primarily as wedding feast food, though in the old days they were ridden in water buffalo races. It was pointed out that one village man had a crooked forearm because he broke it falling off a buffalo in a race. Another village entertainment was water buffalo fights in which two buffalo bulls were pitted against one another.
14. Though the nape of a puppy's neck is clean. Touching a puppy anywhere else than on the nape of the neck, or touching a dog anywhere. It is then necessary to wash the filthy area in water seven times; one of those time the water much contain earth.
15. Kadayans are also Moslems, few of them have dogs.
16. Villagers note that the wild cats hanging around the fish market in Bandar Seri Bagawan are accustomed to a raw fish diet and do not sicken from it.
17. This leads to the situation that residents of Fire Rock Village dump their lazy cats at other locales in Temburong, and residents of other locals dump their lazy cats at Fire Rock Village.
18. One indication of Si Chumat's special pampered status was that when he became very sick he was taken to the district capital to be treated by a Doctor of Veterinary Medicine, a doktor haiwan (literally "animal doctor"); in other words, he was taken to a veterinarian. It was also unusual that

- he had been neutered in youth; this was done to make him a more amiable pet and to protect the house from "spraying." Normally cats of both sexes are left in their neutral state; they reproduce accordingly.
19. Poisonous snakes include banded kraits and cobras. Scorpions 6" or more long can inflict fatal bites.
  20. Brunei cockfights use 3" long sharpened spurs, the loser usually dies of a stab to the heart and fights seldom last more than 5-10 minutes.
  21. Antibiotic salve is provided to put on the wound. In an extension of veterinary use of humans, family members may use this salve for their own large cuts and scraps.
  22. Older villagers have vivid memories of cholera and typhoid epidemics. And though Brunei is now malaria-free such was not the case until the 1960s. Villagers fully comprehend the analogy of cattle epidemics to devastating human epidemics. They also realize the debilitating effects of chronic non-fatal conditions in livestock, by analogy with the way malaria once debilitated humans.
  23. Part of the formal religious school instruction given to boys of 12 or 13 includes practice in killing chickens. At around this age boys are circumcised and thenceforward are accounted as adult males, and are expected as adults to kill chickens as necessary.
  24. Interestingly, traditional dukun knowledge of human anatomy is heavily based on things seen from the dissection of cattle being prepared for food. Pointing out specific details of these analogies is part of the training given to future dukun.
  25. To Moslems eating pork has the same emotional revulsion that eating feces has for Americans.
  26. Newspapers are imported from overseas and used to wrap purchases made in the store. One shopping trip

brought home parts of Municher Zeitung and the Los Angeles Times.

27. Betel nut chewing is a universal habit of the older generations. One of the ingredients used in the chew is a chalk paste which every household keeps on hand.
28. The relationship of the agricultural extension service to farmers is a topic too broad to be covered here. One basic problem is that the agricultural extension agent is acting within the framework of a bureaucracy with all its demands and habits. The farmer is operating in an utterly different context.
29. It is this perception which is important with regard to village veterinary practices, not the statistical "actuality or non-actuality."

## NEWS AND ANNOUNCEMENTS

### DIRECTORY OF TROPICAL RESEARCH SITES

A directory of tropical research sites where British ecologists, including undergraduate students, would be positively welcomed has been prepared by DR. A. G. MARSHALL, Department of Zoology, University of Aberdeen, Aberdeen AB9 2UD, Scotland, U.K. The aim is a) to assist ecologists to find a suitable site for research, and b) to help those running ecological stations in the tropics to find suitable workers to assist in the maintenance of these stations. He has information on 30 sites in 24 countries. Information on each site is available in the form of a two A-4 questionnaire.

### XIVTH BOTANICAL CONGRESS

The XIVth Botanical Congress will be held in Berlin-Dahlem, 24 July to 1 August, 1987. The Congress Scientific Program has been divided into six sections: Developmental Botany, Environmental Botany, Genetics and Plant Breeding, Metabolic Botany, and Systematic and Evolutionary Botany. The section on Systematic Botany

will be convened by DR. W. GREUTER. Presentation of contributed papers will be by abstracts or posters only. There will be general lectures at lunch time as well as public lectures in the evenings. Upon request opportunity will be provided for workshops, discussion groups, and meetings of international associations. The full registration fee is DM 500.00 "if timely announced;" later it will be substantially more! English will be the official language.

ORGANIZED SESSION, 85TH ANNUAL MEETING AMERICAN ANTHROPOLOGICAL ASSOCIATION, PHILADELPHIA, PA., DECEMBER 3-7, 1986

Members of the Borneo Research Council present in Washington agreed to organize a session for the presentation of papers at the 1986 Annual Meeting of the American Anthropological Association in Philadelphia, Pa.

The theme of the session will be, "Settlement Patterns in Borneo," and papers may analyze "traditional" and "non-traditional" patterns of settlement. Please remember that the deadline for submission of all materials to the AAA Program Committee is April 1, so abstracts and registration forms must reach the Editor by March 15.

## BORNEO NEWS

### Regional News

DR. A. C. JERMY is continuing his studies on Selaginella in Southeast Asia and is completing an account of the Bornean species. He is also preparing an inventory of the Pteridophytes of the Kinabalu National Park and other protected areas in Borneo. Together with DR. J.A.R. ANDERSON and P.P.K. CHAI a checklist of the vascular plants of Gunung Mulu, Sarawak, is under preparation.

The 5th Inter-congress of the Pacific Science Association was held between February 3 and 7, 1985, in Manila, the Philippines. The botany session included papers on the geological history of the Philippines (DR.

G.G. BALCO, Bureau of Mines, Quezon City), the ecology of the Philippine Dipterocarp vegetation (DR. P. ROJO), phytogeographical relationships between the Philippines, Taiwan, and Botel Tobago (DR. C.E. CHANG, Pingtung, Taiwan), and Borneo via Palawan (DR. C.E. RIDSDALE), and the taxonomic and geographic relationships of Philippine Vitaceae (DR. A. LATIFF).

#### Brunei News

Between March 3 and 12, 1984, MR. M.J.S. SANDS collected on Bt. Payang and at Badas (Balait District).

#### Kalimantan News

From November 22 to December 31, 1983, Messrs. ISMAEL, R. JUSUF, PURWANINGSIH, SUDARMANU, and E. SULAEMAN visited West Kalimantan. They obtained 60 specimens and 150 living orchids.

From February 27 to March 27, 1984, Messrs. GUSWARA, A. SAIM, and B. SUNARNO went up Sg. Katingan (Central Kalimantan) and collected 252 specimens.

From March 26 to April 20, 1984, Ms. M. RAHAYU and Messrs. R. JUSUF, T. KUSWARA, and T. USIN paid a visit to Batu Licin, Muara Uya, and P. Laut (South Kalimantan), bringing back 170 specimens.

"Forest-denudation far outpaces tree replanting" said D. HADIRIJANTO, Mulawarman University, Samarinda, East Kalimantan. According to him 2.16 million hectares of forest in his province have been selectively cut by concessionaires since 1967 and only 775 hectares have been reforested. Although he talked of "selectively cut" he also spoke of "denudated", indicating the result of the cutting. In the same article extensive illegal felling is also mentioned, thus the "denudated area" is obviously much larger than the 2.16 million hectares "legally" denudated. Hadirijanto noted that the failure in reforestation was also caused by the fact that many concessionaires have no forestry experts on their payroll. In the same article DR. S. HADI, Rector of the University, said that "many experts could not get along with their employ-

ers, because the latter are too business oriented" (Jakarta Post 27 April, 1984).

In a previous article in the same paper, W. KADRI, Director General for Reforestation, stated that the supervision system will be more effective in the future, and Forestry Minister SOEDJARWO said that 10 years will be needed to develop the existing forests in Indonesia to acquire a balance between the functions of production, of protected forests, and of conservation forests. Indonesia hopes to increase its timber production to 150 million cubic meters annually by the end of the century through massive replanting over 6 million hectares which are expected to give the country an additional output of 90 million cubic meters per annum. (Jakarta Post 13 April, 1984).

In view of another prediction that Indonesia will no longer be able to export meranti by the year 2000 (Jakarta Post 1 May, 1984, "Fires Bring Misfortune to 105 Concessionaires"), this seems highly optimistic. Moreover, much replanting is with fast-growing exotics, which are not useful as timber. It is the highly prized meranti that is the prime money earner.

#### Rattan Cultivation in Central Kalimantan

In Central Kalimantan many Dayaks earn a lot of money from cultivating rattan. The rattan gardens (kebun rotan) descend from the practice of shifting cultivation (ladang). All or part of the ladang is planted with rattan depending on the number of seedlings and seeds available and the work capacity of the farmers, usually a single family. The total number of seedlings may vary between 200 and 500 per hectare. At the time of production, six to 10 years later, this figure is much lower because in the absence of annual clearing, many stalks die. With very few exceptions no care is taken of the young plantation and the farmer rarely knows the success rate of his plantations before the first harvest. Frequently the number of stalks that survive is insufficient and in due time the ladang is cleared again for a new cycle. A total of 100 rattan stalks per hectare is considered to be a good yield. The time for the first gathering depends on soil quality and the upkeep of the plantations. Subse-

quent harvests of fresh rattan growths from the same ladang reach the marketing stage every three to four years. Farmers using rattan as their chief money crop ideally should have three or four plantations in various stages of production. Once these have been set up the annual rotation of cuttings and income derived from it is more or less guaranteed. In the regions where rattan thus has become the main product the labor is imported from outside Indonesia. ("Reconnaissance Survey for the Selection of Transmigration Sites in Central Kalimantan," ORSTOM Transmigration Project PTA-44, Jakarta, 1981, H. P. NOOTEBOOM).

#### Sabah News

THE ROYAL SOCIETY'S RAIN FOREST PROJECT. A memorandum of understanding was signed in October, 1984, by Mr. LIEW THAT CHIM, Deputy Conservator of Forests in Sabah, and the Royal Society, after which the latter decided to form a new Southeast Asian rain forest research committee to coordinate the next phase of the program. DR. A. G. MARSHALL was appointed Chairman and research coordinator with DR. K. JONG and DR. M. D. SWAINE as committee members. Newsletters outlining the progress may be requested from the Chairman. The Sabah Foundation is financing the construction of a field studies center at Danum for research, training, and education. The center was expected to be ready in June, 1985.

COLLECTIONS. DR. J. H. BEAMAN, with the assistance of his wife, son, and about 30 visitors, who stayed between one day and 6 1/2 months, collected about 4,092 specimens of ferns and flowering plants mostly from primary forests on Mount Kinabalu. A study was made of the impact of fires on the forest following the 1983 drought, seedling regeneration after fire in a primary Dipterocarp forest, forest vegetation structure and composition on ultramafic (ultrabasic) soil, pollination biology of *Rafflesia pricei*, and observations on kerangas vegetation. It is intended to produce an annotated checklist as a contribution of the flora of Sabah, including descriptions of new taxa.

Between February 5 and 17, 1984, Ms. DR. A. E. JANSEN collected 46 mushroom specimens around Ladang Mirimar,

about 60 kilometers north of Tawau, in the State Cocoa Project, and in remnants of primary and secondary forest. Between February 20 and 24 and March 21 to 23, 1984, she collected 46 specimens in the Sepilok Forest Reserve.

SABAH FOREST LOGGING. During 1980 the largest amount of logging in lowland and hill Dipterocarp forests of Sabah went on in the Keningau District according to figures at the Headquarters Office in Sandakan of the Sabah Forest Department. About 56,000 hectares had been logged in this district. In the Sandakan North District there was an even larger area (68,000 hectares). Of the total of 253,017 hectares logged in the whole state, 101,849 hectares have been logged inside Forest Reserves, under concessions with special licenses. This logged-over area of forest reserves equals about 1,017 square kilometers, considerably larger than the 673 square kilometers of the Mount Kinabalu National Park, and is about the size of Tahiti, Hong Kong, 40 percent of Luxembourg, or 30 percent of Rhode Island.

The 151,168 hectares logged outside forest reserves are so-called once-and-for-all logging areas, written off to so-called land development, oilpalm or rubber estates, or small holdings of small farmers.

The total area of Sabah is 76,082 square kilometers. Almost 2,588 square kilometers were logged in a single year, and only one third is reserved as part of the Forest Estate of Sabah. It is a great mystery how it is possible to state, as was done recently in a governmental information bulletin published in the Sabah newspapers, that there is anything left of a sustained yield policy for Sabah's forests.

The facts are that within another five years or so all the lowland forests of Sabah will have been logged except for a few small Virgin Jungle Reserves.

Confirmation of the very heavy logging pressure in this part of Borneo may be collected from some statistics in a publication by the Forestry Agency of Japan, "Demand and Supply of Timber and Present Situation of Timber Industry in Japan, 1982." The timber imports from Southeast Asia in 1981 in Japan alone were as follows:

Indonesia	4,639 million cubic meters	4,506 as logs
Sabah	5,581 million cubic meters	5,538 as logs
Philippines	1,595 million cubic meters	1,467 as logs

(W. MEIJER)

In the Environmental Plant Life Services Newsletter, DR. W. MEIJER (Apartment C7, 1346 Village Drive, Lexington, KY., 40504), further reports on the destruction of Rafflesia sites and the despoilment of the Pinosok Plateau: "A road (has been) bulldozed through to within 1 km or so of the Mesilau Cave and not far from an important Nepenthes rajah site. The road leads to the proposed site of a reservoir to supply housing, etc. built on the Pinosok Plateau development (an area itself already destroyed). Not only the line of the road destroyed a broad band of the valley floor, but the spoil is filling the river at several points."

PAPERPULP PROJECT. The Borneo Bulletin (18 February 1984, as cited in the Environmental Plant Life Services Newsletter 1/3, 1985) reports plans for a paperpulp project near Sipitang. The project will cost M\$ 1.265 billion and will create 3,530 jobs for people more educated and better skilled than the fishermen, farmers and forest dwellers of the 30 Murut villages inside the area. It will strip all the forests of about half of the steep mountainous area of Gunung Lumaku Forest Reserve (81,869 hectares), 25,800 hectares of Extension I and II of Gunung Lumaku, 160,585 hectares of Ulu Sungai Padas, and 3,625 hectares of the Klias Forest Reserve. The siltload on the coastal fishery grounds will be enormous.

Local farmers and jungle dwellers may be forced out of the area. The logging area will destroy the catchment of the Padas River which is now being used for a hydroelectric plant. Foreign advisers from countries without any tropical forest environmental experience have assured state officials that the marine life and the ecology of the land will be protected.

Nowhere in Sabah has any scheme for paper and pulp under local rainforest conditions proven feasible. Most of the local fast growing trees have been ignored in the FAO-sponsored research projects. During the next three years 12,140 hectares will be cleared for the project, which may last for only 10 years.

Sarawak News

STUDIES OF THE FLORA OF GUNUNG MULU NATIONAL PARK SARAWAK, edited by A. C. JERMY, the coordinator of the Gunung Mulu exploration 1977/1978, has been published.

COLLECTIONS. Between February 23 and March 3, 1984, Mr. M.J.S. SANDS made various trips with Messrs. JUGAH, B. LEE, and A. MOCHTAR in Division I (Kuching, Bau, Lundu Districts) collecting Begonia.

B O O K R E V I E W S , A B S T R A C T S  
& B I B L I O G R A P H Y

Chudnoff, M. TROPICAL TIMBERS OF THE WORLD, 1984, U. S. Department of Agriculture, Forestry Service, v + 464 pp., ill. (Available from the Superintendent of Documents, U. S. Government Printing Office, 710 N. Capitol St., Washington, D. C., 20402. U.S. \$16.00)

This voluminous book offers good value for little money. It compiles information on over 370 tropical timbers and will be of interest to anyone who has to answer questions about properties and uses of tropical woods.

For each timber information (if available in the literature) is provided on the following topics: botanical name (often several or all species of a genus are grouped and sometimes species belonging to more than one genus are dealt with together), family, vernacular names, geographical distribution, tree stature, general wood characteristics (color, luster, grain, texture, odor, taste, allergenic or toxic properties, etc.), weight, mechanical properties, drying and shrinkage, working properties,

durability, preservation and uses. References to relevant literature are coded at the end of each description. There are separate sections for timbers from tropical America, Africa, and Southeast Asia and Oceania. Extensive tables on properties and end uses at the end of the book facilitate comparison of the tropical timbers with each other and with eight of the most common commercial species from the U.S.A. In addition there are appendices with references to comprehensive standard texts, with generic synonyms and groupings, and with a derivation of toughness values and kiln schedules.

As the author points out in his introduction, this compilation is specifically aimed at filling a need in the U.S.A. where import of a great variety of tropical timbers dates from fairly recently. On the other hand, he may be confident that this concisely presented information will be welcomed by users of tropical timbers all over the world. (Flora Malesiana Bulletin, pp. 185-186, P. Baas)

Levang, Patrice, 1983, "L'appréciation de la fertilité d'un sol par les Dayaks du Kalimantan Central," Journal d'agriculture traditionnelle et de botanique appliquée; 30, 20, pp. 127-137, bibliography, tables.

This article is concerned with folk techniques of evaluating soil fertility. It explains how the Dayaks of Kalimantan Tengah class soil according to their fertility and shows how this classification does not contradict the results obtained by pedological studies. For the Dayak, a soil is fertile when the rice yield is high. The principal characteristics of the Dayak cultivation system are discussed. Then an explanation is given of the various indications for fertility and some simple tests used by the Dayak.

Weinstock, Joseph A., 1983, "Rattan: Ecological Balance in a Borneo Rainforest Swidden," Economic Botany, 37(1), March, pp. 58-68, bibliography, maps.

Rattan in tropical rainforest swiddens of South-eastern Kalimantan is an indigenous system of producing both food and a cash crop without ecological disruption. The role of rattan in the daily lives of Bornean people and the history of its cultivation and use are briefly

discussed, followed by a note on rattan's botanical nature. The rattan/swidden system used by the Luangan Dayaks is described and attention is given to intervening economic factors which often throw the system out of balance.

Sellato, Bernard, 1984, "Memoire collective et nomadisme (enquete ethno-historique a Borneo)," Archipel, 27, pp. 85-108, tables.

In the course of 18 months during 1979-80, the author investigated the rich oral traditions of several hunter-and-gatherer groups inhabiting the central region of Kalimantan, in an attempt to reconstruct their history as far back as possible. For him, reconstruction consists of tracing the historical facts from myths, tales, legends, songs, etc., literary forms which may not be considered historiographic as such, but which are inspired, at least in part, by real occurrences. The oral literary forms are considered the "collective memory" of the group in which they are produced. The article presents three texts and suggests that they date from 1915, 1835, and 1750 respectively. The first is considered an historical text, the second a legend, and the third a myth, suggesting the progressive erosion of historical elements in texts. The historical "depth" of texts varies by ethnic group. The author describes socio-economic factors which act as determinants of conservation and transmission of collective memory. It is also suggested that texts are important for establishing and maintaining ethnic identity and delineating local notions of time.

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#### NOTES FROM THE EDITOR (Cont'd.)

Morgan, Robert Nicholl, Carsten Niemitz, Cesare Parisi, Roger D. Peranio, Gottfried Roelcke, Anne Schiller, B. J. L. Sellato, John O. Sutter, Peter Thomas, and Patricia Vondal.

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