HUNTING OF BIRDS OF PARADISE AND TRADE IN PLUMES IN THE JIMI VALLEY, WESTERN HIGHLANDS DISTRICT

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In the following text I have endeavoured to indicate my sources of information when not based upon personal observation or knowledge. Any misinterpretation of the facts or statements supplied to me is entirely of my own making.

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A NOTE ON ORTHOGRAPHY

The orthography adopted for vernacular terms in the following pages is that employed in the standard writing of Pidgin English. In addition the following symbols have been used:

c	as in <u>ch</u>urch
ngg	as in fin<u>g</u>er
ɨ	the schwa, as in mur<u>d</u>er

Prenasals have been included.
The schwa in place and local grouping names has been anglicised.

PART 1

1. INTRODUCTION

1.1 Background to the Study

For centuries Bird of Paradise plumes have been exported from the New Guinea region. Ripley (1947:137) for instance, suggests that in the time of the Ming Dynasty (1368-1643) Chinese traders obtained plumes from Misol Island. Cheesman (nd. 36) reports the trade of plumes to Chinese in the Humbolt Bay area of West Irian as much as two hundred years before European involvement in the trade. By the late 1700s a well established trade in plumes operated between the western New Guinea islands and the Aru Islands and the Mollucas (Forrest, 1780:134ff.) Much of this trade was probably carried out with Macassan seafarers.

Plumes probably were first exported from the New Guinea archipelago in the seventh century A.D. (Hughes, 1971:30). Wallace (1886:549) cites John van Linschoten as noting that Bird of Paradise plumes were already entering Holland in the 1500s and by about 1600 skins began arriving regularly in Europe (Gilliard, 1969:21).

Despite the antiquity of this trade with the outside world, trade in bird plumes has probably been occurring within New Guinea for a far greater period. White (1972:91) gives radiocarbon dates for human occupation of the Kafiavana site near Goroka as 10,730 years BP. Deposits of possible human provenance in the Batari site near the Lamari River have been dated at 16,850 BP (White, 1972:16). "By 11,000 BP", White notes (1972:147), "small groups of people, probably hunters and gatherers, became semi-permanent occupants of the Highlands...Trade for valuable marine shells probably went on from the begining and these, together with red ochre, were used for decoration". While there is no direct evidence for the antiquity of the use of bird plumes in early New Guinea cultures, it is possible that plumes have been of importance for much of the period of occupation of the Highlands.

To date there have been few published records of networks of trade in plumes in the Highlands, and fewer records of the ecology of birds in relation to human occupation of the land and exploitation of the birds. Many anthropologists and others have remarked upon the plume trade, but, their interests lying elsewhere, they have not always identified the species involved or the centres from whence plumes are obtained or to which they are traded. A recent study by Hughes (1971), however, of precontact trading systems in the Highlands includes much information on trade in bird plumes. The present study, then, is in part a contribution to the ethnographic record of one part of the New Guinea Highlands for which considerable information is already available (e.g. Clarke, 1971; Cook, 1966 1969, 1970; Hughes, 1971; Lowman-Vayda, 1971; Rappaport, 1968, 1969a, 1969b; Vayda and Cook 1964; Vayda, 1971).

1.2 Objectives of the Study.

Over the last few years there has been increasing discussion, both in Papua New Guinea and overseas, over the future of Birds of Paradise. Calls to conserve the birds "before it is too late" have been voiced with increasing insistence. Yet, the Papua New Guinea Department of Agriculture, Stock and Fisheries have long recognised the particular difficulty in establishing a sound programme for the conservation of Birds of Paradise. Despite the long-standing fascination of professional ornithologists for the Family Paradisaeidae, present day knowledge of the ecology of the birds is still far from complete. For a long period of time man has been a very important factor in the ecology of certain species of Birds of Paradise. Not only does human occupation of the land, and the attendant changes effected by agriculture influence bird populations, but the high cultural value placed upon the plumes of Birds of Paradise as objects for personal decoration and wealth, stimulates intensive hunting of the birds. To the end of

gaining information on the effects of man upon bird populations, the Department of Anthropology and Sociology of The University of Papua New Guinea, in conjunction with D.A.S.F. distributed in 1969 a questionnaire to a number of anthropologists and similar research workers. To date 48 completed returns have been received. Preliminary analysis of these confirms the commonly voiced opinion that peoples of the Wahgi and Chimbu Valleys employ the greatest varities and numbers of plumes of all New Guinea societies. It is just these people who, in the main, lack access to suitable forested areas in which to hunt plume-bearing birds. A considerable volume of plumes is therefore obtained by trade from more extensively forested areas on the fringes of the Highlands. These fringe areas must therefore provide plumes not only for their own inhabitants[1] but also for the dense populations in the main Highland valleys.

The Jimi Valley was chosen as a location for the present study, not only by virtue of its relative ease of accessibility, and because basic ethnographic information is readily available, but also because it is known to be a major source area of a variety of Paradisaeidae plumes finding their way into the Wahgi and Chimbu areas.

This essay is not concerned with problems of theory. The primary aim is rather to detail the hunting practices and trading relations of one small area of the Highlands. Following some background information on the environment and the human populations, Part 2 will be devoted to notes on those species of birds exploited for their plumes. In Part 3 details of hunting and trapping methods will be presented, followed by a discussion of group and

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1. Some Highland fringe people, notably in the Southern Highlands, do not in fact utilize Paradisaeidae to any great extent, despite large numbers of wild birds being present.

individual rights and restrictions on hunting, both traditional and non-traditional. In Part 4, following a brief survey of the cultural uses of plumes and their social and economic significance, detailed information will be presented upon the network of trade in plumes. Some concluding remarks will be presented on the viability of the plume trade both in the traditional and monetized sectors of the economy.

It is hoped that this study will not only document a complex of activities of considerable cultural significance, but also provide information to those involved in planning conservation programmes for Birds of Paradise.

1.3 The Study Area.

The Jimi Valley is located in the northern portion of the Hagen Sub-District, Western Highlands District. The valley is separated from the densely populated Wahgi Valley by the Sepik-Wahgi Divide which rises to over 3,700 m in places. North of the Jimi River, the Bismark Ranges divide the Jimi drainage system from the Simbai River and its tributaries which flow into the Ramu River. The Jimi River itself rises to the east on the slopes of Mt. Wilhelm where the Bismark Ranges and the Sepik-Wahgi Divide merge to form the central massif of the Bismarks. Flowing westwards the Jimi merges with the Gai, or Lai River draining off the northern slopes of Mt. Hagen. From this point on the river is called the Yuat[1], which ultimately flows into the Sepik River.

The Jimi Valley, constituting the Jimi Census Division, is administered from Tabibuga Patrol Post. Most of the valley, except the lower portions, is included in the Jimi Local Government Council, which is made up of 45 Wards.

The study area is indicated on Map 1. Little meaning should be attached to the boundaries of the area. These do

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1. Pinaye speaking people of the Yuat Gorge actually called the river the Sau (Bulmer, 1968a:5).

not follow the territorial boundaries of local groups visited, although they include most such territories, but are drawn with simplicity and convenience in mind. The area so enclosed is roughly 540 square km. (208 square miles).

Within this area visits were made to, and data collected from those settlements underlined on Map 1. Further information was gained from informants of other settlements, both within and beyond the study area. Although Kwibun, Tsinggoropa, Koinambe, Yimpegema, and Tabibuga are included within the study area, information obtained relating to these settlements is minimal. While much of the data presented in the following pages is probably relevant for these settlements, little mention will be made of them.

A total of three month's research was undertaken during 1972. In April-May, settlements bordering the Pint Basin were visited. Other settlements were visited during June-August.

Culturally and linguistically the Jimi is diverse. The languages of the study area, however, are all related, and are classified by Wurm (1964:69) as constituting the Jimi subfamily of the Central Family of the East New Guinea Highlands Stock. These languages are Maring (Yoadabe Watoare, vide Wurm [1964:85]), Narak, and Kandawo. Language boundaries, based on Cook (1966) Wurm (1964), and my own limited information gained in the field, are indicated on Map 1. Linguistically and culturally these groups are related to the Kuma of the middle Wahgi Valley and the north slopes of the Sepik-Wahgi Divide (Cook, 1969:97; Rappaport, 1969a:117; Reay, 1959b:1).

To the west of the study area are Karam speakers on the north bank of the Jimi, and Malpa speakers on the south bank. Beyond these groups are the Kopon near the Kaironk River and the Enga towards the Lai River.

The Jimi people are swidden agriculturalists and pig

raisers. Sweet potato and taro provide the staple food crops, although a considerable variety of indigenous and introduced crops are also grown (see, e.g. Clarke, 1971: 225ff.; Rappaport, 1968:44ff.). In addition to pigs, which, as in other parts of Highland New Guinea are of ceremonial importance, domestic livestock includes fowls, ducks, and dogs. Cassowaries, obtained in the bush when chicks, are also kept. All these animals are occasionally eaten, as are small quantities of wild game, and nowadays, tinned meat and fish.

1.4 Social Organization.

Described below are certain aspects of the social organization of the people of the study area which are of relevance to the following discussion.

Data on the social organization of the Maring has been presented by Lowman-Vayda (1971) and Rappaport (1968, 1969a, 1969b) and on the Narak by Cook (1969, 1970). The structural units for both these groups has been examined by Vayda and Cook (1964). Kandawo social organization appears similar to that of the Maring and Narak. In addition, Reay's (1959a, b) data on the Kuma of the Wahgi Valley is of relevance. The people of the study area are organized into 16 named, major groupings, which Vayda and Cook (1964), following Ryan (1959) designate as clan clusters. A clan cluster consists of two or more clans, and is the largest named nonexogamous group in the structural hierarchy. A clan cluster is also the largest territory holding group and the largest unit whose members act as a single unit in ceremonies and formerly, warfare. Alliances existed between clan clusters for the purposes of warfare, although such alliances were not stable. Rappaport (1968:109-152) and Vayda (1971) have analyzed such alliances in periods of hostilities.

Clans may be defined as "the largest exogamous putatively patrilineal descent groups in any given structural hierarchy. Further, clans are localized with respect to male members and

with respect to female members who have not married" (Vayda and Cook, 1964:799). Most clans are further subdivided into subclans, and a few subclans into sub-subclans. Vayda and Cook identify the functions of clans and their subdivisions as follows. Clans are the largest single units whose members aid each other in bride and death payments; the largest unit with a common burial ground; and (usually) the largest unit claiming land within the forested zones. Subclan members tend to bear the largest part of bride and death payments, and rights to gardening land tend to revert to the subclan in the event of there being no lineal heir or appointee. These authors could find no discernable functions of subsubclans.

Clans, subclans, and subsubclans are putatively patrilineal descent groups. Putatively because non-agnates, other than wives, may be assimilated into the groups. Moreover, genealogical connections between agnates may not always be demonstrable. This may be the case even among putative agnates of a single subsubclan (Vayda and Cook, 1964:799). Cook (1970) for the Narak has outlined the processes whereby non-agnates are assimilated into the agnatic group.

Some clans are grouped within a sub-cluster of their relevant clan cluster. These may be antigamous groups[1] sharing a common territory, and believed by their members to share a common ancestor. Rappaport (1968:20) has termed such a grouping of clans as a "cognatic cluster", on the basis of putative cognatic relationships and corporate rights to land. One such cognatic cluster has been identified for the study area: the Mokai-Saweng-Kandakai-Yamakai cluster of the Tugumenga clan cluster of Kwima. Relationships between the clans of this cluster are rather more complex than among the Tsembaga-Tomegai cognatic cluster of the Tsembaga clan cluster discussed

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1. That is, groups whose members do not marry one another.

by Rappaport (1968:20). Of the Mokai-Saweng-Kandakai-Yamakai cognatic cluster, intermarriage between Saweng and the other three clans is not permitted because:

a) Mokai and Saweng share a common ancestor

b) Kandakai and Saweng share a common ancestor, different from (a).[1]

c) Yamakai and Saweng share garden land and are therefore "brothers".

Kandakai and Yamakai are also antigamous, although I omitted to obtain informants' statements as to the reasons. Possibly, since Yamakai and Saweng are "brothers" by virtue of shared garden land, the ban on Kandakai marrying Saweng has been extended to the Yamakai. It seems likely that these four clans are in the prosses of both fision and fusion, although I do not have enough data as to which of the clans are fisioning and which are in the process of fusion.

Rappaport (1969b) discusses the processes whereby usufruct rights to gardening land are made to affines. Such grants may in fact become grants in perpetuity, serving in time to obscure the clan boundaries of clans involved.

> Through intermarriage, and then by grants in perpetuity through affinal connections, the land of adjacent groups becomes intermingled. As neither a man nor his subclan 'brothers' should take a wife from his mother's natal clan, there is partial antigamy between the groups in alternate generations; but the intermingling is maintained because sons tend to maintain rights ceded to their fathers by their mothers' brothers in sites near their own patrilocal residences. Thus, they remain in constant contact with their mothers' natal groups and occasionally receive new grants of land on the basis of their maternal connections. More intermarriage elaborates the web of cognatic relationships for descending generations and further intermingles the garden sites of the two groups...Eventually members of each group can trace cognatic connections to almost everyone in the other group. Cognatic connections

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1. This apparent contradiction did not appear to worry Saweng informants. They asserted that there was only one ancestor for Saweng, while Mokai and Kandakai had different ancestors.

> replace marriage as the preferred means for acquiring rights in land, and intermarriage ceases. What may be called an 'affinal cluster' (two or more clans whose garden lands are becoming intermingled through affinal transfers) has become a cognatic cluster (Rappaport, 1969b:118).

This process may explain at least the Yamakai and Saweng association. Rappaport (1969b:119) goes on to suggest that in time, when actual connections between members of a cognatic cluster can no longer be recalled, agnatic connections will be assumed. Thus the cluster will have been transformed, or fused, into a single clan.

Less commonly, members of a clan may invite members of another clan cluster to join them on their land. This appears to have generally occurred where a clan had been weakened by deaths or migrations as a result of warfare or internal dissensions, and invited members of another local population approaching a critical population density to join them in occupancy (Rappaport, 1969b:122). The arrangement was no doubt to the advantage of both parties, relieving population pressure in one area, and strengthening local numbers in another area, thus reducing the possibility of defeat in future hostilities. Reay (1971:176ff.) describes similar processes for enlarging clan numbers among the Kuma in order to strengthen a clan's representation in the Local Government Council.

It is the structural units of clan clusters, clans, and subclans, outlined above, which are the social units of most immediate relevance to this essay.

2. THE ENVIRONMENT

2.1 Climate

Details of the climate of the Simbai Valley just to the north of the study area across the Bismark Crest can be found in Clarke (1971:39-50) and Rappaport (1968:32-33). It is likely that the climatic regime for the Simbai is similar to that operating in the portion of the Jimi Valley under consideration here.

Rainfall figures collected by Clarke (1971) in the Gunts area of the Simbai Valley are somewhat higher than the figure he provides for Tabibuga (1971:42). The average yearly rainfall at Tabibuga, over a six year period, is 123 inches. The seasonal distribution of rainfall, however, is much the same. The wetter period lasts from about November to April, with the intervening dryer period from May to October. Rain mostly falls in the later part of the afternoon and early hours of darkness.

Temperatures in the eastern part of the study area in the Bubgile region were noticeably cooler than the Bokapai region. In part these differences may be explained by the fact that observations were separated in time, when different climatic processes may have been operating. Differences in aspect also may explain temperature differences. Bubgile is exposed to the north west flanks of Mt. Wilhelm, and cold air can be felt blowing in from this direction from 1600 hours onward. Mist often developed early in the evening, clearing fairly late in the morning at about 0800, and nights were very cold. By contrast, temperatures in Bokapai were noticeably higher, especially at night. Bokapai is exposed to the widening valley of the lower Jimi, and appears to be in the path of warmer air flows moving up the valley. In addition, being exposed to the west, Bokapai experiences longer hours of direct sunlight.

It has not been determined to what extent these climatic differences affect vegetation types and distributions, faunal populations, or subsistence activity.

2.2 Terrain.

The Jimi Valley is broader in the western part of the study area than in the eastern part. The Jimi itself does not flow in the centre of the valley, but on the northern side close to the Bismark Crest. The numerous streams of the Valley are deeply incised, producing a diverse and rugged topography. Slopes tend to be steep, and landslips are common.[1] Some slips may leave scars several acres in extent, but for the most part, damage seems to be minor. Most slips noted had probably resulted from streams undercutting soft sedimentary deposits and shales.

Two geographical features in particular stand out in this region of narrow, steep-sided ridges and valleys. (See Map 1). One is the Pint Basin, just to the north of Koinambe. Though much of the basin is of steep topography, relatively large amounts of gently sloping land do occur, especially on the eastern side where tributories of Pint Creek flow in from the Kupeng area. The northernmost point of the Basin, in the Tsuwenkai area, affords a pass into the Simbai.

The second noteable feature lies to the east of Bubgile. At this point, the Bismark Crest falls abruptly from the towering ridges leading to Mt. Wilhelm, and affords a low pass into the Ramu fall. This pass is probably no more than 1,830 m a.s.l. From the crest, the land slopes fairly gently towards the Jimi. To the northwest it rises to 2,100 m or more, to continue in an unbroken chain to the point where the Kaironk River breaks through to join the Jimi.

Appendix 1 lists the more significant altitudinal readings taken.

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1. Slips occur in both cultivated and uncultivated land. None were observed in climax forest, but only in secondary forest. Slips, from casual observations, appear to be more common in cultivated land.

2.3 Vegetation

A fuller account of the vegetation of the study area will be presented in section 2.5. A few brief notes will be offered here, prior to a discussion of the effects of human activity upon vegetation.

Within the study area very few observations were made of undisturbed climax forest. Such forest exists principally on the major ridge tops in the eastern and western parts of the study area. Even in the vicinity of hunting trails some distance away from settlements, some evidence of man is all too evident in the form of felled trees and gashes in nearby tree-trunks.

Primary forest at lower altitudes seems even less free from human interference than higher altitude forest. Partly, no doubt, because such forest is of easier access and more restricted in distribution.

Clarke (1971:207-224) and Rappaport (1968:247-251) give details of the floristic composition of primary forest for two regions of the Simbai Valley abbutting on, and probably applicable to, the study area.

The distribution of vegetation types discussed in this section is shown on Map 2.

Robbins (1968) has noted that biogeographers have not yet reached agreement as to the most satisfactory classification of tropical rainforest types and the altitudinal ranges of these. In the following discussion the classification of vegetation types follows Clarke (1971:53ff.) except that while Clarke mentions two primary forest types (Montane-Crest and Lower Montane), I have distinguished three (Montane-Crest, following Clarke, except that I have distinguished this type of forest as beginning at a higher altitude, Montane, and Lowland forests). No apology is made for adding to the confusion of nomenclature here. To the observer unschooled in botany or biogeography differences in vegetation may be easily noted. Such differences are not always made a basis for the biogeographer's classif-

ications. At least one biogeographer's classification (Robbins, 1968) appears to mask such observable differences which are of some significance in explaining founal distributions. Since Clarke's classification (and my own amendments) do take into account such differences, and since this classification is partly based upon conditions in the nearby Simbai Valley, Clarke's arrangement is the basis for the following discussion of vegetation types.

The lower limits of montane, or high altitude forest, vary within the study area from about 1,520 m a.s.l. in the Kwima to Bubgile area, to about 1,830-1,890 m from Kupeng on, downstream. Tongues of forest extend below these limits at various points, and gardens and secondary growth extend above the 1,520 m level to the east. Where the forest begins at about 1,830 m, such intrusions are less common.

Within the study area lowland forest is of much more restricted distribution, and is found from the Jimi River up to altitudes of about 1,220 m. Generally, however, the altitudinal range of lowland forest is considerably less. At Koinambe, this forest occurs in a belt spanning only about 90-120 m in the vertical. Lowland forest finds its greatest altitudinal range in the vicinity of Kwiop, where it extends from the Jimi River at 610 m to almost 1,220 m in places on the north bank. Near Koriom, lowland forest becomes much reduced, and it is doubtful that any primary lowland forest occurs from here upstream, except for the region east of Agemba Creek near the Bubgile-Ramu pass.

Between the two forest types dealt with above lies the zone of secondary forest and gardens. Upstream from about Koriom this extends right down to the Jimi itself. The upper and lower limits of this zone are somewhat vague, grading as secondary forest does into montane and lowland forest. In general, however, the upper limits

are about 1,706-1,830 m in the eastern part of the study area, and about 1,830-1,985 m in the western part. The lowest recorded upper limit was about 1,432 m on the track from Kwiop to Agemba.

Scattered within the zone of secondary growth and gardens occur patches of grassland communities. Between Koriom and Bubgile grassland is almost absent, occuring only in small patches on former garden land. These patches are not pure grassland, but invariably support a few shrubs and occasionally saplings. It is in the western parts of the study area that grass-land gives the appearance of stability. Here too are to be found the largest areas of grassland.

2.4 Effects of Human Activity.

In forested areas, both primary and secondary, the most notable interference of the environment by man, aside from clearing for gardens, is the extraction of forest products for human use. Edible plants, and vegetable fibres are collected, lianas may be cut to be used as bindings for carrying bundles or the construction of houses, trees felled for building, or to obtain wood for axe and shovel handles or the manufacture of spears to be sold to the missions for the tourist trade. Trees may also be felled to examine hollows for the presence of animals, where there is no easy means of climbing to make such inspections. The inhabitants, however, generally reveal a fine discrimination of those trees needed for their immediate purpose, and so damage is kept to a minimum. Planted casuarina trees, and trees that have died of natural causes or been ringbarked in, or removed from garden sites provide most of the firewood used.

The most striking testimony to the influence of man on the environment is the amount of secondary growth and garden land. This covers approximately two thirds of the study area, and is attributable almost entirely to human

gardening activity.

To these deliberate attacks upon the forest must be added the casual actions of the wanderer in the forest. Not only are axes and bushknives used to clear a path through the forest, but a man will often pause to ring-bark a sappling in an absent minded fashion, or trim back a large fern to a naked stump with his bushknife. Undoubtedly such actions influence the configuration of the forest to some extent, particularly in the understory.

Both these deliberate and haphazard attacks on the forest tend to be concentrated in those parts of the forest near settlements, as these are of nearest access and most frequently visited. The result would seem to be a reduction in the rate of transition of the forest into different successional communities. The selective extraction of certain species probably also results in forest communities composed of slightly different associations from what might be the case under conditions free from human interference.

Domestic pigs foraging in the forest cause considerable disturbance in ground cover, rooting up small shrubs and seedlings. In some places, where pigs have turned over large areas of earth, rain produces quagmires of heavy clayey mud where few plants appear to grow. Few domestic pigs seem to wander deep into the forest, but mostly confine their activities to secondary growth and the fringes of disturbed primary forest. In the forest behind Kwiop evidence of foraging pigs beside the track leading to Agemba was not noted above 1,430 m. This altitude also marked the approximate transition of advanced secondary forest into disturbed primary forest. In the forest behind Bokapai, churned earth and pig droppings were observed almost to 2,140 m.

If it is assumed that pigs have a fairly constant maximum radius of daytime dispersion from women's houses or special pig houses where they are accommodated at

night, it follows that their depth of penetration into forest, as well as their altitudinal range, depends upon the location of their night shelters. Hence, where their shelters are located close to the forest edge, which generally will correlate with a higher or lower altitude in respect of the two primary forest types, the pigs will be able to forage deeper into the forest, and to greater or lesser altitudes. Thus, since pigs are domestic animals, not only can they be regarded as agents of influence of the human population, but the extent of this influence in forests is a direct function of human settlement patterns.[1]

Clarke (1971:53) labels all forms of vegetation not planted by man as "spontaneous vegetation". In the following discussion, however, I propose to sub-categorise Clarke's label by the terms "secondary growth" by which may be understood all spontaneous vegetation occuring outside the montane and lowland forest zones. "Climax forest" will refer to undisturbed montane and lowland forest, and "disturbed primary forest" to forest which has been disturbed by one or more of the activities discussed above. "Primary forest" will refer to both climax and disturbed primary forest. The majority of sections of primary forest personally visited would fall into the "disturbed" category. The amount of disturbance falls into a continuum, and I found it by no means easy to decide where disturbed primary forest ended and secondary or climax forest began.

Comparison of aerial photographs for a section of Pint Creek, taken in 1959 and 1969[2] show obvious changes in

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1. Feral pigs appear to be more common in lowland forest than in montane forest. Much of the disturbance by pigs in lowland forest can therefore be attributed to feral animals, while, for the most part, disturbance in montane forest is due to domestic pigs.
2. Department of Forests, Magin, CAJ115, Run 4, 5130-5149, 21.5.1959; Kamboga, CAJ1282, Run 5, 2116-2126, 13.5.1969.

secondary growth, gardens, and grassland areas. Overall, it seems that the total area of grassland has not changed to any marked degree.

The amount of tall timber, however, has been reduced. Observations from the ground show some of this to be disturbed primary forest.

Dr. E.A. Cook (personal communication) notes that over a ten year period up to the present, much primary forest has been cleared in Kwiop land. Mr. Jack Edwards, A.D.C. Tabibuga (personal communication) makes the same observation for the Jimi as a whole.

The increase in the area of land under secondary growth and gardens cannot be attributed solely to increasing population. Since 1962 population has not increased appreciably.[1] Probably of more significance is an increase in coffee plantings. Comparative figures are available for the years 1968-69 and 1970-71[2] for several settlements. The increase in the total number of coffee trees planted is shown in Table 1.

Table 1
Increase in Coffee Plantings

	Total		
	1968-69	1970-71	% Increase
Koinambe	1,915	7,323	271
Kompiai	14,593	22,877	57
Kupeng	735	7,696	965
Kwima	8,926	11,268	26

From this table it can be seen that the minimal increase in planting has been about one quarter, and the largest increase almost tenfold. There are no figures for the area of land under coffee. It does not necessarily follow that the area of land under coffee will increase at the same rate as the increase in the number of trees

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1. Patrol Report, Jimi River, No. 4 of 1962-1963; Village Population Register, Western Highland District, 1971.
2. Patrol Report, Western Highlands District No. JR2 1968/69 and No. 3/1970-71. In view of the limited time available to Patrol officers to undertake adequate censuses of coffee trees, these figures may not be entirely accurate.

planted, although one might expect a fairly close correlation. Assuming this correlation, and assuming that the amount of garden land remains more or less constant (if not increasing slightly to provide for slightly increased population), it follows that more land must be cleared to accommodate increasing coffee plantings. Since coffee is a semi-permanent crop, the increasing amount of coffee being planted means that increasing amounts of land are lost to subsistence agriculture. Hence, new gardens must either be cut in existing fallow areas, thereby reducing the overall amount of potential gardening land for the future, if the fallow cycle is to be retained at its present rate of operation, or must be cut from primary forest, thereby reducing the area of land available for the collection of wild forest products. Alternatively, the fallow cycle could be speeded up, with possible long term reduction of the productivity of the land, but avoiding the necessity of clearing primary forest to accommodate new garden sites. A further solution is to clear primary forest for coffee groves, as has been done, for instance by one man in Tsuwenkai.

As will become evident later, primary forest yields products of considerable economic and cultural aesthetic value.

Robbins (1963) argues that short Thermeda grasslands are anthropogenic, resulting from long term cultivation and burning. Brookfield (1964:33) extends this argument to Imperata grasses in the Highlands, and while agreeing that such short grasses are of the anthropogenic origins Robbins identifies for Thermeda, suggests that periodic burning may be necessary for their stabalization. Except in one instance, all informants asserted that gardens are not, nor have they even been made in grassland. In fact, several gardens were observed being prepared in grassland dotted with shrubs and sapplings up to about 6 m high near Kupeng. No gardens were seen amidst "pure" grassland. The

one exception noted in informants' statements was made by a man in Bokapai. Here a number of terrace-like formations were observed on a steep hillside covered by short grass. According to my informant, these were the marks of old garden sites. Similar terraces were observed in grassland high up on south-east facing slopes in the Pint Basin. Alternatively, such terraces may be the result of soil creep rather than gardening activity. Terracing of gardens is not practised by the present population, although gardens may be divided by lines of logs laid on the ground. Such dividing marks, however, are generally oriented at right angles to the contours of the land.

Rappaport (1968:36) suggests that grasslands in Tsembaga Maring territory may be "the result of the activities of an earlier population for whose presence there is archaeological evidence in the form of stone mortars and pestles that are occasionally found in the ground". These terraces, if of human origin, may well be further evidence of such a population.

Irrespective of the origins of grassland, man is wittingly responsible for the continuation of at least some areas under grass. At Kupeng in August, the height of the dryer period, several fires lit to burn the trash in new garden sites spread to nearby grassland. Several fires were also deliberately lit in grassland to promote fresh growth. It was explained that the present grass was brittle, and unsuited for thatching of buildings.[1] Brookfield (1964) has argued for the importance of fire in the maintenance of grassland communities. The demand for grass for thatching has greatly increased in recent years. Traditionally, houses were often roofed with

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1. Such burning is probably also employed to flush game when hunting, although informants did not state this as a reason for lighting fires in grassland.

pandanas palm fronds. Nowadays, returning labourers often build themselves Europeanized style houses of woven pitpit and grass thatched roofs. The burgeoning of Mission and Administration buildings in many settlements has added greatly to the need for thatching material.

Although fires lit in new garden sites occasionally spread to surrounding scrub, it seems unlikely that they would do much damage to advanced secondary or primary forest. This is because such forest, other than that dominated by Araucaria spp. (Professor Ralph Bulmer, personal communication) is too damp to burn readily. Within the study area, however, Araucaria occurs only in very small scattered stands, at least in the present. Fires are often lit late in the afternoon or early evening when the wind has dropped so as to guard against the danger of fires spreading to surrounding areas.

2.5 Ecological Zones.

The study area can be conveniently divided into a number of ecological zones, reference to which will be made in the following discussion. Essentially, the divisions between the zones follow the transition between the major vegetation types.

2.5.1 Montane Zone

This zone corresponds to high altitude primary forest of the montane and montane-crest forest types.

Montane forest is of mixed floristic composition. Members of the oak family are common, and may reach heights of 25 to 30 m or more. The canopy is more or less continuous, although somewhat sparce in patches. Stratification of the forest is not constant. In some parts only a single layer of trees forming a canopy is evident, while elsewhere one or two lower strata of trees, sapplings, and occasional palms are also present. In general the herbaceous layer is sparse and in places almost absent.

Several Pandanus species are common in the montane forest, and may reach a height of up to 30 m. These sometimes occur singly, sometimes in groves. Where there are concentrations of Pandanus they may form a fairly continuous canopy several acres in extent.

The montane forest grades into what Clarke (1971:53) terms montane-crest forest, and which some authors call moss-forest, or cloud forest. On the track between Kwiop and Agemba montane-crest forest was noted from about 1,830 m. At Tsuwenkai, visits were made to the forest to altitudes of about 2,200 m. where trees conformed more closely to montane-crest forest type (Clarke, 1971:54), becoming stunted and more thinly spaced. In the vicinity of Bokapai the transition of montane forest into montane-crest forest was noticeable as high as 2,330 m. However, the development of moss was by no means as dense as noted at lower altitudes further upstream.

No figures for the total area of primary high altitude forest are available. However, examination of aerial photographs shows that such forests are most extensive in the eastern portion of the study area, from about Kwiop on upstream. Forests in the Simbai abbutting on this eastern area, are similarly extensive. In addition to vegetation types, this zone is set apart from others by climatic factors. Mists and rain are common, especially on the higher ridges and peaks. Precipitation is certainly greater here than in any other zone, and informants remarked, perhaps exagerating somewhat, that there was constant rain above about 2,130 m. Altitudinally this zone ranges from between about 1,520-1,980 m to the highest peaks of about 2,440 m.

2.5.2 Lowland Zone

This is the zone composed of lowland or low altitude primary forest. This is the smallest zone and the most restricted in distribution within the study area. Nowhere does this zone occur above 1,220 m in the study area. In the following discussion, reference will also be made to this lowland forest zone to the east of the Tsau River and in the lower Jimi Valley, north of the Bismark Crest in the Simbai Valley, and the very extensive forests in the Ramu lowlands.

2.5.3 Zone of Human Habitation

This zone corresponds to secondary forest and garden lands.

The majority of gardens are cut from secondary forest, only a few being made by clearing primary forest. This zone presents a patchwork picture of gardens, homesteads, low scrub, planted casuarina groves, and secondary forest in various stages of development. The actual area of the land under gardens constitutes only a minor portion of this zone, much of the land being covered by incipient lowland and montane forest.

For the purposes of later discussion, this can be categorized into the following sub-zones.

2.5.3.1 Secondary forest

Composed of advanced secondary forest, woodlands, and groves of spontaneously occuring vegetation. This sub-zone thus presents a varied picture ranging from tall, advanced secondary forest, to lower, relatively open-spaced woodland communities on slightly dryer sites.

Clarke (1971:61) estimates that this secondary forest approaches the characteristics of montane forest within about 30 years after clearing. Such advanced secondary forest covers less area than other secondary communities ranging from low, often thick scrub, through woodland formations, to groves of tall, whitebarked, spreading Albizia species (vide Clarke, 1971:62) and their attendant understory of woodland species or tangled shrubs and ferns.

The range between the Jimi and Tsau Rivers is almost entirely under secondary growth and gardens, except for lowland forest towards the Tsau-Jimi confluence, and along the east bank of the Tsau. The majority of this land lies outside the study area, and little of this area was observed at close hand.

2.5.3.2 Bush fallow

I use this term to distinguish vegetation types from similar communities labelled woodland above. Bush fallow is characterized by a lower, scrubbier growth. Shrubs are common, and the ground cover may be quite dense. Tall trees, left standing when gardens were originally cleared, may rise above the low, irregular canopy of bush fallow areas.

It seems reasonable to distinguish bush fallow from secondary forest largely on the basis of age. From Clarke's (1971:61) data, it seems likely that what I have termed bush fallow here has developed within about 10 years after the abandonment of garden sites.

2.5.3.3 Gardens and homesteads, casuarina groves and plantations

Those areas, in other words, dominated by vegetation actively induced by human activity, and experiencing the most intense human interference. Groves of casuarina, however, may be found in secondary forest or bush fallow zones, where spontaneous vegetation has been permitted to spring up.

2.5.3.4 Grasslands

While some grassland areas appear to be stabllized communities, others are in the process of being colonized by bush fallow communities.

Although this has not been positively identified, much of this grassland is probably composed of the short Imperata cylindrica grass, common on dryer sites. This has been recorded in the nearby Simbai (Clarke, 1971:65; Rappaport, 1968:36).

The north east facing slopes of Mieng Creek near Bokapai form the most extensive single area of grassland while the grasslands of the Pint Basin constitute about 20% of the Basin's total area. Nowhere else in the

study area is such a development of grassland to be found. Elsewhere the largest tracts of grassland are to be found between Kupeng and Kwima, particularly on the lower slopes near the Jimi. From Kwima upstream, the amount of grassland steadily decreases, until the area becomes negligible after about Koriom. Similarly, little grassland is to be found between the Tsau and Jimi Rivers.

2.5.4 Faunal Zones

These three major zones, based on different vegetation communities, also support different faunal populations. These differences have been most accurately determined in the case of birds, although the distribution of certain mammals and other animals can also be spoken of in terms of the ecological zones outlined above.

Examples of birds confined to one ecological zone are the Blue-breasted Pitta (Pitta erythrogaster) and Lowland Eupetes (Eupetes caerulescens) for lowland forest; the Black Fantail (Rhipidura atra) and Black Sickle-billed Bird of Paradise (Epimachus fastosus) for montane forest; and the Pied Chat (Saxicola caprata) and New Britain Mannikin (Lonchura spectabilis) for the zone of human habitation. A few species, such as the Greater Woodswallow (Artamus maximus) are to be found in all three habitats, although this species is more common in the zone of human habitation. More species are to be found in two of the three zones. In the latter circumstance it is generally the case that those zones occupied have a common border. That is, the zones inhabited will be either lowland forest and the zone of human habitation (e.g. Magnificent Bird of Paradise, Diphyllodes magnificus), or montane forest and the zone of human habitation (e.g. Superb Bird of Paradise, Lophorina superba). It is much less common for the two forest zones to be inhabited while the intermediary zone is not. An instance of this last situation is provided by the Dusk-orange Lory (Pseudeos fuscata), which roosts in the montane

forest, but flies in large flocks to the lowland forest in the morning where it feeds till late in the afternoon, when it returns to the montane zone. During the day small parties may remain in montane forest. This forest therefore provides more than merely roosting places.

Birds of the two forest zones which also frequent the zone of human habitation are often to be found in the secondary forest sub-zone, although a number also visit other sub-zones too. That is, when present in more than one zone, there is a tendency to frequent those areas of one zone most similar to the characteristics of the other.

The three major zones outlined occur in a recognizable pattern of broad belts of the two forest zones separated by the zone of human habitation. Within the study area, the two upper zones of montane forest and human habitation are constantly present. The lowland forest is present near the Jimi River from the western edge of the study area up to about Korion. This zone appears to be absent below Kompiai, as well as upstream from Koriom.

3. POPULATION

3.1 Population Distribution

Vayda's (1971:3) statement that Maring population densities in both the Jimi and Simbai increase with distance upstream seems applicable to non-Maring communities in the eastern portions of the study area. However, while population figures are available for the study area (see table 2), it has not been possible to delineate with any accuracy the boundaries of each clan cluster territory. Thus no firm calculations can be made concerning densities.

Approximate clan cluster territories are indicated on Map 3.

Table 2
Population by Census Centre[1]

Census Centre	Population	Census Centre	Population
Bokapai	597	Kwiop	342
Tsuwenkai	276	Koriom	425
Yimpegema	263	Mogine[3]	298
Koinambe	333	Kosap	618
Kompiai	824	Bubgile[4]	1,227
Kupeng	583	Kwibun	695
Kwima[2]	933	Tsinggoropa	450
Togban	797	Tabibuga	695

Total Population 9,256

Relating these population figures to approximate clan cluster territories, one can make some comparative statements concerning population densities.

If we view the density of population in terms of the total land held by a clan cluster within the Jimi Valley, then densities in Kompiai, Kwima, Togban, Koriom and Kosap approximate densities in Bubgile land. Bokapai, Tsuwenkai, Yimpegema, Koinambe, Kwiop, and Mogine-Kelunga all have lesser densities.

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1. Includes absentees. Source: Village Population Register Western Highlands District, 1971.
2. Includes Isemban clan cluster of Ndega.
3. Includes Teregan clan cluster of Kelunga.
4. Excludes the smallest of the five constituent clans, Aindem.

These rough indices of comparative population densities refer only to Jimi land held by populations on the north side of the river in the study area. Land claimed on the north fall of the Bismarks has not been taken into account, partly because the extent of these territories is not known, and partly because such land does not appear to be exploited for more intensive subsistence purposes to any great extent. The only population of the three claiming land north of the Bismark Crest which apparently has permanent settlements there is the Yomban of Togban (Vayda, 1971:fn. 6). Only two of the three Yomban clans claims land in the Simbai, however. The Aindem clan of Bubgile has not been taken into account in the comparative density indices above, although Jimi land held by them has been. Bubgile densities may thus be slightly higher than is suggested above.

Being unable to establish the territorial boundaries of the Molema of Kwibun and Tsinggoropa, and the Morkai of Tabibuga, I will not attempt comparative densities for these clan cluster.

Lowman-Vayda (1971:321) estimates that average population density for ten Maring clan cluster territories is about 59 per square mile. She does not identify all the clan clusters involved, although both Simbai and Jimi groups are represented. Data is provided, however, for the Kauwatyi of Kompiai. The overall density in Kauwatyi territory is about 77 per square mile, and the economic density about 100 per square mile. Economic density is the number of people per unit of secondary forest and cultivated land; that is, population density in respect of that part of a territory most intensively utilized for subsistence purposes.

Certain objections can be raised over the criteria for calculating economic density in this way. Firstly, primary forest does yield products of significance for subsistence, and therefore should not be entirely

ignored. (See, e.g. Clarke, 1971: Appendix B, 1; Rappaport, 1968: Appendix 8). Secondly, some primary forest areas have been cleared to increase arable land (see section 2.4), and further areas of land at present under primary forest are suitable for gardening. To ignore all primary forest areas in calculating economic density is to arrive at density figures somewhat higher than may in fact be the actual or potential case as Rappaport (1968:286) has shown for the Tsembaga Maring. Conversely, grassland areas, which in some places are quite extensive (see section 2.3), should not be included in the area of arable land when calculating economic density, since they are not used for gardening (except in Kupeng).

However, Lowman-Vayda's figures for Kauwatyi density may still stand, as the Kauwatyi have imposed a taboo upon themselves prohibiting the clearing of primary forest for gardens (Vayda, 1971:20).

In 1971 about 5.7% of the population of the upper and middle Jimi were absent (Logan, 1971). Mr. Jack Edwards, A.D.C. Tabibuga (personal communication) estimates that 32% of the total workforce of the Jimi is currently absent on contract labour, mainly in coastal areas.

Aside from absentees, away on work or attending schools and training centres, the population, at least of some Maring groups, has been declining in recent years. During the 1930s or 1940s a dysentry epidemic reduced the population by about 20%, and the present rate of decline is about 1% per annum (Vayda, 1971:20). 1971 census figures suggest a slight increase in population, which may be a new trend. At any rate, these past declines, and the present number of absentees, must mean that present day densities are less than they were prior to contact.

3.2 Settlement Patterns

Within the zone of human habitation house sites are generally constructed between 600 and 1,830 m. Houses are generally dispersed along ridge tops[1] as at, for instance, Kwima, where much of the population is spread along a single ridge, and Bubgile, where each of the five clans of the cluster occupy separate parallel ridge tops. Some settlements, such as Tsuwenkai, are mostly dispersed along the middle section of ridge flanks. At Kupeng, one of the settlements with the most dispersed pattern of settlement, quite a number of homesteads are located on flatter land at lower altitudes in the valley of the upper Pint Creek.

Generally there is a residential segregation of the sexes. In some areas, males appear to have their houses located on higher land than women's and pig houses. However, I have no firm data on this, and it may not be a dominant pattern.[2]

Members of each clan tend to have their house sites located close to one another, so that the overall settlement pattern for a clan cluster is of separate pockets of residential concentrations. These may be scattered more or less evenly throughout the zone of human habitation, as at Bubgile, or be somewhat nucleated, as at Kwima.

3.3 Access to Ecological Zones

3.3.1 Zone of Human Habitation

Since the following discussion centres on wild resources of the forest little need be said here about the availability of arable land. There appears to be no shortage of land for subsistence gardening or cash cropping within the study area, except possibly in the case

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1. Clarke (1971:100) has noted the same trend for the Bomagai-Angoiang Maring of the Simbai.
2. Clarke's (1971:101) map does not reveal such a pattern.

of the Kauwatyi (see Vayda, 1971:21). In view of the abundance of land, fallow periods can be fairly long. For Tsembaga land, Rappaport (1968:237) estimates fallow periods to vary from 15 to 35 years, while Clarke (1971:157) estimates an average fallow period of 40 years for Bomagai-Angoiang land. Bulmer (in press), however, has cautioned against an uncritical acceptance of Clarke's figure. He notes that the recent adoption of several crops of American origin prior to which wild foods were seasonally of greater importance than at present, along with the introduction of steel tools in the 1940s and 50s, and a disasterous dysentry epidemic of the 1940s have all led to changes in the ecological relationships of man to land. Hence, he concludes, the interpretation of vegetation in terms of contemporary land use patterns is "a hazardous procedure". Notwithstanding these reservations, there appears to be ample time for the development of secondary growth as suitable habitats for a variety of valued bird species (see section 4.2).

3.3.2 Lowland Forest Zone

The only populations apparently lacking access to this zone are the Kundagai of Tsuwenkai, the Ogona, Teregan, and Owelga. While the Kamam have little lowland forest in their Jimi territory, they have a considerable amount of this forest in the Ramu fall. In fact, of all local populations in the study area, the Kamam probably have the largest area of lowland forest. The Yomban and Isemban also have extensive tracts of lowland forest north of the Bismark Crest. The Molema and Morkai probably have access to the largest amount of such forest within the Jimi, especially near the Tsau River.

Since valued birds inhabiting lowland forest and present in the study area also frequent secondary forest in the zone of human habitation, lack of access to lowland forest does not necessarily seriously affect a local population's access to such birds. As has been pointed out above,

there appears to be ample secondary growth to meet demands upon wild resources under consideration here.

3.3.3 Montane Forest Zone

Since, as will be shown in section 4.2, most of the more highly valued bird species inhabiting the study area are restricted to this zone, access to montane forest is rather more critical in respect of exploitation of valued species than is access to lowland forest.

Populations lacking access to this zone are the Cenda, and probably the Amberakwi, Molema and Morkai. The Cenda formerly held territory up to the Bismark Crest, which included montane forest, but following defeat in warfare in the mid 1950s by the Kauwatyi, they gave all of this montane forest, as well as some prime garden land near the Pint Creek, to their allies the Kundagai, as an acknowledgement of former aid, and to make future help from the Kundagai more certain (Vayda, 1971:17).

Populations with access to only limited amounts of montane forest are the Kundagai of Bokapai, much of whose land in this zone is degraded, the Kauwatyi, and probably the Owelga.

Of all groups with access to montane forest, the Kauwatyi have perhaps the least amount of such forest. Vayda (1971:20) estimates that they have little over one square mile of montane forest, and notes that they have imposed a taboo upon themselves to preserve what little forest they have left from clearing for new gardens.

Vayda (1971:21) also notes that the Kundagai consider themselves short of montane forest. While this is apparently so far the Kundagai of Bokapai, the Kundagai of Tsuwenkai appear to have ample amounts of montane forest. As will be shown in section 7 rights of access to the Kundagai territories of Bokapai and Tsuwenkai are strictly guarded in the present day, if not in the past.

Besides the Tsuwenkai Kundagai, other groups with access to large amounts of montane forest, whether in respect of a large area of such forest or by virtue of relatively low population ratio to forested areas, are the Manamban, Yomban, Manga, and Ogona. The Isemban probably also have access to large amounts of land in the montane forest zone, by virtue of a low population as well as fairly large tracts of montane forest occuring in their Jimi and Simbai territory. Although Mogine-Kelunga have only a relatively small area of montane forest within their two clan cluster territories, their small populations allow for a higher ratio of forest to man than might otherwise be expected.

3.3.4 Differential Access of Clans Within Clan Cluster Territories

Clan and subclan territories will be examined more fully in section 6.1.

Data on clan territories are incomplete for the Kundagai of Bokapai, the Amberakwi, Cenda, and Kauwatyi, although it seems likely that all clans of at least the Kundagai and Cenda clan clusters have access to all ecological zones within the cluster territories. Data were not gathered concerning clan territories for populations on the south side of the Jimi, nor for the Teregan or Owelga.

Necessarily for existence the majority of people have access to garden land, although some clans may be short of such land. Cook (1970) for the Narak, and Rappaport (1969b) for the Maring, have described processes by which those short of land may acquire rights in perpetuity to land in territories of different subgroups. Reay (1959a) has described similar processes for the Kuma of the Wahgi Valley to whom the Kandawo have strong linguistic and cultural ties.

Of the nine clan clusters whose territorial arrangements are known, the montane zone occuring within their

territories is not split up into clan territories in two cases, is subdivided for all clans in five cases, and in three cases one of the constituent clans has no territory in the montane zone. In no case does more than one clan of a cluster lack territory in the montane zone.

In lowland forest, two clan clusters have no access to this zone, in one cluster one clan lacks access, while in another, two clans lack access to this zone. In the five remaining clusters, all clans have territories embracing lowland forest either in the Jimi or the Ramu fall, or in both areas where this forest is present. These distributions are shown in Table 3.

Although the sample is too small to make valid generalizations from, there may be a correlation between clan cluster population size and the number of clans with access to the forested zones. Table 3 suggests that with increasing population there may be a tendency for one or more clans to have no access to one of the zones. In no case is a clan without access to both types of forest. Conversely, where clan cluster populations are lower, there seems to be a tendency either for no territorial subdivision on a clan basis, or for each clan to own land within both forested zones where these are both present. However, any such relationship between clan cluster size and differential access of its constituent clans to different ecological zones, may not be causal, but might rather derive from the particular stage of processes of fision and fusion of clans and clan migrations, irrespective of clan cluster size.

As a final point, it should be pointed out that while the foregoing discussion is phrased in terms of access and lack of access to the montane and lowland zones, in fact all clans appear to have access to both zones, even those whose territories do not include the zones. However, clans lacking any territorial claims to one of the zones

Table 3
Access of Clans to Forest Zones

Clan Cluster	Population Size	Number of Clans	No. of separate territories: Montane Zone	No. of separate territories: Lowland Zone
Kundagai (of Tsuwenkai)	Small (Less than 400)	3	Nil (all access)	Nil (no access)
Manamban	Medium (400-700)	2	1 (1 no access)	1 (1 no access)
Tugumenga	Large (700+)	7	3 (4 share = 6 with access, 1 no access)	2 (4 share = 5 with access, 2 no access)
Isemban	Small	2	2	Nil (both access)
Yomban	Large	3	2 (1 no access)	3
Manga	Small	2	2	2
Ogona	Medium	2	2	2
Kaureka	Small	2	Nil (both access)	Nil (no forest)
Kamam	Large	5	5	5

are subject to limitations as to what may and may not be extracted from the forest. This aspect of rights of access to forest products by members and non-members of territory holding groups will be dealt with more fully in section 6.

PART 2

4. BIRDS EXPLOITED FOR PLUMES

Notes on the ecology, status, and distribution of each species are presented below, with particular emphasis on birds of the Family Paradisaeidae, Birds of Paradise. Shorter notes are appended concerning other birds utilized for decorations.

Local names for species mentioned in the following discussion are listed in Appendix 2.

4.1 Synopsis of Species Exploited

In Table 4 are listed those species of birds recorded from the examination of collections of plumes and other valuables retained by men. A total of 185 collections was censused, in ten separate clan clusters.

Table 4
Systematic List of Species Exploited for Plumes

Species		No. present in census sample of 185
Henicopernis longicauda	Long-tailed Buzzard	1
Harpyopsis novaeguineae	New Guinea Harpy Eagle	1
Sterna sp.	Tern	1
Pseudeos fuscata	Dusk-orange Lorikeet	2*
Trichoglossus haematodus	Rainbow Lorikeet	16
Domicella hypoinochrous	Eastern Black-capped Lory	62
Charmosyna papou	Fairy Lory	214
Charmosyna pulchella	Little Red Lory	9
Cacatua galerita	Sulpher-crested or White Cockatoo	19
Psittrichas fulgidus	Vulturine Parrot	93
Larius roratus	Eclectus Parrot	2
Tyto alba	Barn Owl	5
Collocalia ?hirundinacea	Mountain Swiftlet	1
Tanysiptera galatea	Common Paradise Kingfisher	132
Aceros plicatus	Hornbill	5
Pitta erythrogaster	Blue-breasted Pitta	13
Artamus maximus	Greater Woodswallow	1
Manucodia chalybatus	Green-breasted Manucode	1
Epimachus fastosus	Black Sickle-billed Bird of Paradise	2

Epimachus meyeri	Brown Sickle-billed Bird of Paradise	5
Astrapia stephaniae	Princess Stephanie's Bird of Paradise	191
Parotia carolae	Queen Carola's Parotia	6
?Parotia lawesi	Lawes's Six-wired Parotia	3
Lophorina superba	Superb Bird of Paradise	44
Diphyllodes magnificus	Magnificent Bird of Paradise	6
Cincinnurus regius	King Bird of Paradise	1
Paradisaea raggiana	Raggiana Bird of Paradise	31
Paradisaea minor	Lesser Bird of Paradise	93
Paradisaea rudolphi	Blue Bird of Paradise	1
Pteridophora alberti	King of Saxony Bird of Paradise	38
Amblyornis macgregoriae	Macgregor's Bowerbird	2

Total: 31

* Many more specimens seen in plume collections, but unrecorded.

The number of Paradisaeidae thus recorded is 13.

To the above list can be added the following species, observed in decorations on a few occasions, but not represented in the census sample.

Casuarius sp(p)	Cassowary
Ptilinopus superbus	Superb Fruit Dove
Ptilinopus rivoli	White-breasted Fruit Dove
Goura sp	Crowned Pigeon
Neopsittachus muschenbroekii	Yellow-billed Mountain Lory
Domestic Fowl	

The number of species recorded as being utilized for their plumage is thus 37. The actual number utilized more probably approaches 45 if the unidentified species are added. Most of these unidentified species are represented in collections by wings of various parrots, hawks, and a few small passerine bush birds.

Not included in the above Table are feathers of several additional species casually obtained by, for instance, picking feathers up from the roadside, or retrieving a few feathers of a bird plucked before being

cooked. These may be thrust casually into the hair by men and boys. Such actions, however, do not appear to be motivated by a desire to enhance personal appearance or to express personal or group qualities as is the case among the Melpa on informal and everyday occasions (Strathern, 1971: Chapter 3 passim).

Of the species listed in Table 5, at least five do not appear to be endemic to the study area. These, and the endemic species are discussed further in the following section.

4.2 Ecology, Distribution, and Status of Species Utilized

Birds of Paradise will be dealt with first, and shall be given special emphasis. Briefer notes will be given on the other species recorded as providing plumage for decorations. Local populations are here identified by the name of their Rest Houses. The approximate territorial boundaries are indicated on Map 3.

4.2.1 Manucodia ?chalybatus

A single specimen was seen at Waramis near Tabibuga at an altitude of about 1,300 m. Informants in Bubgile and Kwiop remarked that it is common in the lower forested parts of their territories. There appears to be little hunting pressure on this species for its plumage or flesh, and it seems not unreasonable to assume it to be fairly common throughout the study area in lowland forest and secondary forest within its altitudinal range (570-1,700 m Gilliard, 1969:101).

4.2.2 Epimachus fastosus

Nowhere in the study area does this species appear to be common. It is confined to the montane forest zone, and the only specimen observed, a sub adult male, was seen at 1,973 m in Kwiop territory in disturbed primary forest in which Pandanus spp were common. From informants' statements

fastosus appears to be thinly spread throughout the montane zone, including the isolated pocket of forest in Kompiai land. Here a bird, identified as fastosus by companions, was heard calling in the distance. Several old men in various settlements were of the opinion that the species had declined over the years since contact and tended to attribute this decline to hunting pressure. One old man in Mogine thought that fastosus had now been exterminated from Mogine land.

Settlements apparently lacking access to wild populations of fastosus are Koinambe, Yimpegema, Tabibuga, Tsinggoropa and Kwibun, all of which lack suitable, relatively undisturbed montane forest, and Mogine, where the bird has probably been exterminated.

Within the study area the species appears to be slightly more numerous in the Bokapai-Tsuwenkai-Kupeng forests, and perhaps in the Kwiop-Bubgile boundary area. Outside the study area, fastosus seems to be rather more common in the Simbai Valley in the forests between Nimbra and Gunts, and in the Jimi in the Kol region.

Within one of the three sub-territories in Kwiop land, two males of this species were said to exist. It is not known how many eggs are laid by fastosus. E. meyeri lays one egg (Gilliard, 1969:145), and this may well be the case for fastosus. While the breeding behaviour of the Epimachus species is not yet known, the indications are that males display in solitude, rather than in groups as among most of the Paradisaea species. On the basis of this, Mr. Graeme George (personal communication) suggests that the killing of males probably does not increase the ratio of immatures and females to males, since, by the

removal of males, breeding is probably interrupted.[1] Both Professor Ralph Bulmer and Mr. Eric Lindgren (personal communications), however, consider that the proportion of immature males and females to each mature male is likely to be much higher than a ratio of 2:1. This ratio follows from the assumed breeding behaviour outlined above.

A conservative estimate of fastosus numbers for the study area, based upon informants' knowledge of the locations of individual males and opinions concerning the status of the species, is about 100. This is if the ratio of immature males and females to mature males is 2:1. If, as seems reasonable, the ratio is much higher, the number of fastosus may be between 2-300.

Low numbers and the birds' somewhat solitary habits, however, render individual males difficult to discover, especially as they generally are stated to inhabit the more distant parts of the forest. Predation rate from man is thus low. Only two specimens of this species are represented in the census sample, and a further eight are stated by various individuals to have been shot previously.

Both Epimachus spp and Astrapia stephaniae were said to have similar breeding cycles. From informants' statements a rough timetable of breeding behaviour can be constructed. This is represented in Figure 1. At Tsuwenkai I was told that in the early part of the dryer season the young of the long tailed species leave the nest, and the mature males moult their longest tail feathers. During the dry season, displays were said not to occur. Mr. Eric Lindgren (personal

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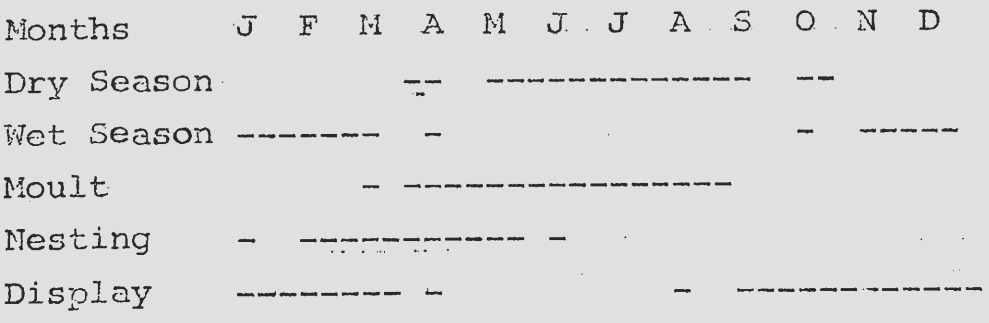
1. Professor Ralph Bulmer (personal communication) tells me that a Karam informant, who is a gifted naturalist, asserts that the males of E. meveri engage in communal display, while males of fastosus do not. Professor Bulmer suggests that, if this information is correct, it has escaped the notice of ornithologists, since, the Epimachus spp. being uncommon over much of their range, there may not be enough males in close enough contact to gather in one spot for communal display.

communication) suggests that moult probably occurs after successful copulation and lasts several months. Gilliard (1969:140,145) reports evidence of breeding for E. fastosus in February, and for meyeri in April-July. Pulling all these scraps of information together, the rough model of the breeding behaviour of the longtails may be as follows. Nesting in the late wetter season and early dry, from about January to May, moulting from about April to late August; that is during the dryer season; and display behaviour during the wetter season, from about September-October to early May.

Mr. Max Downes (personal communication) has advised caution against placing too much faith in the above model. He remarks that moult is not necessarily connected with the breeding cycle, and may be interrupted at various stages. Almost certainly, he suggests, some individuals will not adhere to the sequences laid down in the model, although the model may be a reasonable statement about the general trend of events.

The timetable of breeding behaviour can therefore be interpreted with considerable freedom.

Figure 1
Breeding Behaviour of Long-Tailed Species



4.2.3 Epimachus meyeri

The distribution of this species is considerably more fragmented than the previous species. Where both species of Epimachus are present, meyeri tends to occupy the higher portions of the habitat in forests dominated by the Nothofagus beech (Bulmer, 1968 c:634). Nothofagus is

generally present only above 2,300 m (Robbins, 1960:181). No evidence of Nothofagus was personally observed, and it is possibly present only as remnant pockets in the Bokapai-Tsuwenkai region and in Kwiop and Bubgile land.

Measurement of the skull of an Epimachus retained by a Tsuwenkai man indicates the specimen to be meyeri. Three more cases were recorded of the presence of this species. Of a total of five meyeri represented in the plume census, three had been shot in Bubgile land, the other two having been imported from the Wahgi, and the Kaironk where it is common (Bulmer, 1968 c:634).

All the indications point to meyeri being very rare and highly localized in occurrence.

4.2.4 Astrapia stephaniae

As with Epimachus fastosus, this species appears to be thinly distributed throughout most of the less accessible parts of the montane zone. It was said to be common in the Tsuwenkai and Kupeng forests, and slightly less common in the Kosap and Bubgile forests. Elsewhere it is uncommon to rare. According to one informant, only immatures are left. This remark suggests that informants may tend to be evaluating the status of males only. I was told in Tsuwenkai that females and immatures often visited the forest edge near settlements, while the adult males remained deeper in the forest.

Of 191 Astrapia plumes in the census sample of 185 only 31 had been shot or trapped within the study area by their present owners. Most of these (24), had been obtained in Koriom and Bubgile land. Unfortunately I have no such quantitative data for hunting of this species in the Tsuwenkai and Kupeng area, but it is my impression that it is taken in these forests more often than higher up the valley. Since many of the Astrapia plumes from this area are quickly traded out, I have no means of testing this assertion.

Bulmer's (nd, 3) records for the Baiyer Valley, show breeding to occur in October, when a female was shot at a nest containing one egg, and beginning in perhaps August. It was noted in 4.2.2 that Astrapia and Epimachus moulted at the same time, which may indicate similar breeding times. Bulmer's Baiyer River data, however, is contrary to informants' statements about the breeding times of Astrapia. It may be that Jimi populations of Astrapia breed at different times to Baiyer River populations. On the other hand, as Mr. Max Downes has pointed out, moult is not necessarily associated closely with breeding behaviour.

According to informants, Astrapia engages in communal displays, and as such, the species is probably in less danger of dying out under hunting pressure than Epimachus species. The removal of a male does not so seriously disrupt breeding since others will still congregate at display areas to attract and fertilize females. However, it is worth noting that a number of informants considered that the species has declined over the years, and attribute this decline to hunting pressure.

Outside the study area, informants' statements, supported by data on trade, suggests that the species is more common in the Simbai Valley, and on the north slopes of the Sepik Wahgi Divide in the Kol-Mana area.

4.2.5 Parotia carolae

Apparently a common bird throughout the area, this species is not subject to heavy hunting pressure. Moreover, as it inhabits secondary forest and bush fallow down to at least 1,700 m, as well as montane forest, there is a considerable amount of suitable habitat available to it.

One male often heard and observed at Bubgile, and said to be accompanied by a female and two young birds, frequented bush fallow amidst homesteads and gardens.

4.2.6 Parotia lawesi

Gilliard (1969:183) records this species for the Bismarks, but there is some doubt about its presence in the study area. Bulmer (nd, 2) has recorded it as common in lower montane forest and bush fallow above 1,980 m in the Kaironk Valley to the north west. Mr. Graeme George (personal communication) tells me that if lawesi is present it is most likely to occur above the altitudinal range of carolae. Thus if present, it is probably confined to the higher parts of the montane zone.

The only evidence for the occurence of this species in the study area rests on the descriptions of plumage and display obtained in Tsuwenkai and Bokapai. This distribution could be viewed as an extension of the bird's range from the Kaironk, if, as seems likely, it is not present elsewhere in the study area.

It is of note that informants seem to confuse this species with Paradisaea rudolphi, a bird equally restricted in distribution. The Maring term kambai seems to refer to Parotia lawesi, while aweng refers to Paradisaea rudolphi. However, on one occasion, a rudolphi observed in the wild was labelled kambai, and once Parotia plumes examined were said to belong to aweng. In part, this apparent confusion may stem from a Maring gloss kiawoi aweng which includes the biological species Parotia carolae, Paradisaea rudolphi and probably Parotia lawesi.[1] Informants displayed no confusion in talking of carolae, which is common, but only when speaking of the rarer species of the category. It is of interest to note that the Karam, immediately to the west

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1. The confusion may, in fact, be more on my part, than on the part of informants. As Professor Ralph Bulmer (personal communication) notes, informants are possibly in some cases not distinguishing at all between the two Parotia species, while in others they are doing so but trying to explain two different binary oppositions: between Parotia lawesi and carolae on the one hand, and the two Parotia species and Paradisaea rudolphi on the other.

of the Maring, also refer to lawesi as kambai (Bulmer, nd, 1). Among the Karam, however, kambai is a higher order category rather than a terminal taxon as appears to be the case in Maring. Professor Bulmer (personal communication) suggests that the Maring may have adopted the term kambai from the Karam, but perhaps not fully grapsed the Karam application of the term. He notes (nd, 1) that the Karam use of the term spans several medium-sized, short-tailed Bird of Paradise genera, including Parotia, Lophorina, Loria, and possibly others.

4.2.7 Lophorina superba

This bird is apparently common throughout the study area. At Tsuwenkai females and young birds were frequently encountered in the upper foliage in the montane zone. On visits to forested areas elsewhere, the calls of this species were often heard. No males, however, were observed, and it is probable that they are less common.

In general, Lophorina does not seem to be found much below 1,400 m in the study area. It seems mainly to be found in the montane zone, but also frequents secondary forest and bush fallow. In Tsuwenkai, a patch of fairly advanced bush fallow was pointed out close to a homestead, as the site of the display perch of a male.

Pressure of hunting is probably not detrimental to the maintenance of population of the species, and everywhere, informants considered it to be plentiful.

4.2.8 Diphyllodes magnificus

I have only two sight records of this species, one at Kompiai at about 1,730 m in low secondary forest, and at Kwima at about 1,260 m in bush fallow among homesteads. Gilliard (1969:201) gives the upper altitudinal limit of this species as 1,706 m. At Kwiop I was told that it is to be found only in low altitude forest where it is common. Probably the 1,700 m line is approaching the upper

altitudinal limit for the species in the Jimi. By accounts, it is a common bird in lowland forest and secondary growth in the zone of human habitation. Being little valued for its plumes, and being difficult to observe, it does not appear to suffer much from hunting pressure.

4.2.9 Cincinnurus regius

Gilliard (1969:193) notes that this species may be found at altitudes up to 510 m. As such, it may be expected to be found in lowland forest near the Jimi River in Kainambe and Bokapai land. Bulmer (nd, 3) collected the species between 610 and 915 m in the Baiyer Gorge to the west. However, I have no firm data as to whether this species is present in the study area or not. One Kwima man said it was to be found in lowland forest in Kwima land, and gave an animated description of its display, performed on a vertical vine. His description of its plumage was also accurate except for one interesting reversal. He was adamant that its white abdomen and lower breast were, in fact, black. Another Kwima man considered that Cincinnurus was probably to be found in the Simbai, and in the Jimi near Tsuwenkai and Bokapai, but not at Kwima. Anything unknown, however, is often stated by eastern Jimi Maring to be found at Tsuwenkai and Bokapai, so little weight can be given to this statement.

One informant from Kompiai stated that the species is present near the Jimi in Kompiai territory. Beyond the study area, it is also present in land in the Ramu fall claimed by Bubgile. The only specimen represented in the census sample had been obtained there.

4.2.10 Paradisaea raggiana

This species is absent from the study area, although present in the Wahgi Valley. Essentially a bird of the south east of New Guinea, it is replaced in the Jimi by its northern counterpart, P. minor.

Hughes (1971:137), however, states that raggiana is present in the middle and upper stretches of the Jimi. Dr. Hughes (personal communication) tells me that while on the track between Tabibuga and Koinambe a russett coloured bird was briefly seen which his Chimbu companions identified by the term applied to raggiana, and added that it was a female. The more likely explanation is that since most Chimbu are unlikely to be familiar with live P. minor they had mistaken a sub-adult male minor for a female raggiana. If seen only briefly these birds would appear very similar.

My own information strongly suggests that raggiana is not present in the Jimi. No one admitted to knowledge of its presence, although informants were aware that it was present in the Wahgi.

4.2.11 Paradisaea minor

Within the study area, this is a very common bird, although not evenly distributed. In general, numbers appear to decrease as one travels upstream. From Kelunga to Bubgile it is relatively uncommon. Calls were heard in all territories however, except Tsuwenkai, the only settlement with apparently no access to wild populations of minor although a few individuals may exist in bush fallow and secondary forest in Tsuwenkai land near Pint Creek. Direct observations suggest that the species is most common in Koinambe, Kwima, Kwiop, Tabibuga, and Tsinggoropa lands. It is likely to be plentiful also in Bokapai, Yimpegema, Ndega, Togban, Koriom, and Kwibun lands, and possibly also in Kompiai and Mogine territory.

The scarcity of minor in Tsuwenkai (if present at all) Kelunga, Kosap, and Bubgile Jimi lands is probably attributable to a lack of suitable habitat and pressure from human population. In part, the lack of habitat is a function of human population pressures. Bubgile land, supporting a large population by Jimi standards, has been

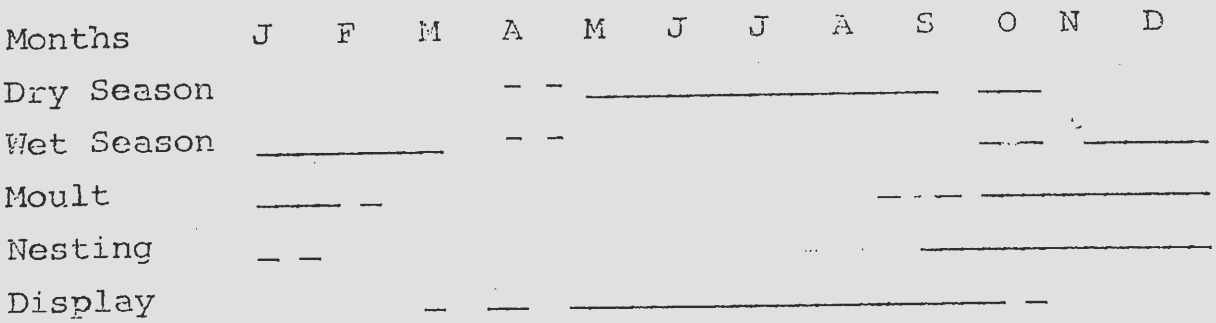
subject to more extensive clearing of bush for gardening.

Observations put the upper altitudinal limit of minor at about 1,530 m. Females and immature birds frequented casuarina groves and isolated native trees amidst homesteads, as well as secondary growth, but sub-adult and mature males were not observed to venture beyond fairly well advanced secondary growth and lowland forest. It seems that for display and hence successful breeding purposes, the Jimi populations of the species require advanced secondary growth or lowland forest. It is just this requirement which is not fully met in the settlements listed above. Gardening activity has reduced stands of tall, thick timber considerably, and, as noted in section 2.3 lowland forest is probably absent. The lack of suitable habitat, combined with direct hunting pressure, especially at Bubgile are probably the main reasons for minor's scarcity above Kulunga. It is possible that minor climatic differences, noted in 2.1 for Tsuwenkai and Bubgile also affect the distribution of minor either by direct influence on the birds, or by contributing to changes in the availability of food.

Beyond the study area, minor is very common in the Tsau River-Kwibun area (Bulmer, 1955). The territories of Ndega, Togban, and Bubgile extend into the north fall of the Bismarks, and in the lower parts of this land minor appears plentiful. This is particularly the case in Bubgile land, probably since it is only on the west that Bubgile land in the Ramu fall borders upon the territory of another group, the Maring speaking Bomagai-Angoiang clan cluster. Togban and Ndega land in the Simbai is bordered on all sides by other territories. To the north and east of Bubgile Ramu fall land, there is a vast expanse of lowland forest with apparently no permanent settlements south of the Ramu. These Ramu lowlands possibly afford one of the largest undisturbed retreats for minor in New Guinea.

The breeding behaviour of minor is represented diagramatically in Figure 2. It is said to display in p.e.[1] taim bilong drai. To what extent this statement refers to the dryer season or any time when rain is not actually falling was not clear from informants' statements. However, information relating to other aspects of breeding suggests it refers to the dryer season. Displays were said to begin in late June. Certainly, in June-August, displays were in progress, but it was not determined if display activity was more or less intense than at other times of the year. Moult of the males' ornamental plumes was said to begin in November and December, and new plumes to develop in April-May. During this time, no displays are performed. This scheme of events seems consistent, and is used as the basis for constructing Figure 2. Nesting probably occurs mostly in the wetter season while moult is in progress. Gilliard's (1969:235) data supports this time of nesting.

Figure 2
Breeding Behaviour of Paradisaea minor



Display trees of minor are individually claimed, and inherited. Some trees have been claimed continuously for at least three generations, and male birds may have been continuously shot at them for 60 to 100 years. If all adult males congregating at one tree are shot, many informants stated there was a danger of the trees being deserted. In an attempt to determine the approximate population of

1. Pidgin English.

minor for the study area, men in a number of settlements were asked to list display trees known to them, and the number of adult males displaying at each tree. Lists extracted are by no means complete, although trees occuring in Kwiop territory are best documented. Unfortunately, during the first period of fieldwork, I omitted to gain such data on Koinambe, Kompiai, Tsuwenkai and Bokapai.

Almost certainly, more display trees exist than I have recorded. Thus the population of minor is bound to be underestimated.

While many men could list display trees owned by others, very few could state how many adult males visited these trees. Many men could not even state the number of males visiting their own trees. Of 85 trees recorded in the study area, I have figures for the number of males at each of 52.

It appears that males take five years to develop (Gilliard, 1969:216,223: data on P. apoda and raggiana). Under natural conditions it seems that for each immature male there are two mature males, and for each immature female there are two mature females. Thus for each mature male there is a ratio of one adult female and one immature of either sex, or one male: one female: .5 immature male: .5 immature female, that is, one adult male: 2 other birds, female or immature male. Mr. Graeme George (personal communication) of the Hallstrom Bird of Paradise Sanctuary at Baiyer River has provided these basic data about age sex ratios under "natural" conditions, and those that follow under conditions of intensive hunting. I gratefully acknowledge Mr. George's assistance in constructing the following population figures. In subsequent discussions, Mr. Eric Lindgren, Wildlife Ecologist, D.A.S.F. concurs that the methods employed in the following computations are valid ones for the calculation of population structure and numbers. While the resulting figures are open to question

they are included since, according to Mr. Lindgren, they constitute the first attempt to calculate minor populations for any area. As such, the figures, however inaccurate, may be of some value.

Under conditions of intensive hunting, assuming that each mature male is killed within 2½ years of reaching maturity, that is, each male is up to 7.5 years old when killed, then for each mature male, three have been killed within their second or third breeding season. Thus the ratio for each mature male alive becomes two immature males, two immature females, and four mature females, or one adult male: eight immature males, and female birds. 52 trees recorded support a total of 129 mature males, or an average of 2.48 males per tree. Assuming the 1:8 ratio holds for the study area, then each tree carries a total of 22.32 birds on average. The total minor population for the 52 trees is thus 22.32 x 52 = 1,160.64.

Alternatively, the population for the 52 trees can be arrived at by multiplying the total number of males by the ratio of immature and female birds. 129 x 8 + 129 = 1,161. Where the total population is 1,161, the average number of birds per tree is 1,161 ÷ 52 = 20.4.

Assuming these averages hold for all 85 recorded trees, then the total population of minor for all trees recorded is 22.32 x 85 = 1,897.2 or 20.4 x 85 = 1,734.[1]

This figure relates only to the territories of Kupeng, Kwima, Ndega, Togban, Kwiop, Mogine, and Dubgile, and is far from complete for these settlements, particularly for Kupeng, Ndega, and Dubgile. Thus, less than half of the settlements in the study area are covered. The total minor population then, basing it upon the above figures, could be brought up to about 5,000 birds.

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1. If, however, males visit more than one display tree, then some of the recorded 129 males may have been counted twice. Hence, overall numbers will be somewhat less than these figures of 1,160.64 and 1,734.

Alternatively, the minor population can be estimated in the following way. Although these calculations have less statistical support, I consider they present a picture closer to actuality than the above figures. The following calculations are based on the minor population for Kwiop, for which territory the display trees of minor, and the number of males visiting them are most accurately reported. 51 display trees are recorded for Kwiop, and 51 males visit 20 of these trees. Thus, an average of 2.45 males visit each tree. At the ratio 1 male : 8 immature and female birds, there are thus 22.05 birds per tree, or 1,124.55 for the whole 51 trees.

In taking this figure as a base from which to estimate populations in other territories, three variables must be taken into account: the status of the birds, as determined by personal observations and informants' statements; the relative amounts of suitable habitat for minor; and hunting pressure from man. The calculations, in round figures, are given for each settlement in the study area in Table 5.

Table 5
Estimated Population of Paradisaea minor

Bokapai	800
Yimpegema	500
Tsuwenkai	0
Koinambe	800
Kompiai	500
Kupeng	300
Kwima	500
Ndega	300
Togban	800
Kwiop	1000
Koriom	800
Mogine	500
Kelunga	300
Kosap	300
Bubgile	200
Kwibun	1000
Tsinggoropa	500
Tabibuga	800
Total	9900

This estimate is nearly twice as much as that gained by less subjective means. However, the estimate of 5,000 has been greatly affected by the lack of any figures for several settlements, and the incompleteness of figures for others. Since even full data on the Kwiop population has not been obtained, the real population of minor may be several thousands more than 9,900.

Hunting pressure on minor seems slight. Of 93 plumes represented in the census sample, 35 had been shot by their present owners. Of these, only 14 had been shot in the Jimi, the remaining 21 having been obtained in the Ramu fall. However, plumes of minor are valuable, and frequently traded, and the birds are hunted extensively in the Jimi, although considerably more plumes are obtained in the Ramu fall land claimed by Ndega, Togban, and Bubgile, and more are traded in from Simbai Valley settlements. Under present hunting patterns and methods minor appears to be maintaining its numbers. While some informants remarked that other valued birds were becoming less plentiful, no such fears were expressed concerning minor.

4.2.12 Paradisaea rudolphi

This is known to occur in Tsuwenkai where a sub-adult male was observed, and calls heard and in Kupeng, where calls were heard. It was also stated to be present in Bokapai and Kompiai land. These statements can probably be taken on trust. Outside these four settlements, knowledge of the bird is sketchy at best. One man from Kol said it was uncommon there, while two men from Kudjip near Banz said it was common in their territory.

As far downstream as Togban the usual answer to the question "Where is ka goi,[1] or kabang aweng[2] to be found?" was in the kunai, the term generally used in Pidgin

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1. Narak, Kandawo, and Kuma for rudolphi.
2. Maring for rudolphi.

English to denote the Wahgi. Such a response does not indicate that respondents know the bird. Indeed, the indications are that people knew only the name. No one appeared able to describe rudolphi nor to recognize my own descriptions of it. Some professed not even to have heard the local name for it before. Several informants in Kwima claimed to know of the bird, but could not say precisely where it was to be found although they stated it did live in the Jimi. Even here, some informants were evidently ignorant of rudolphi. This is interesting, in that it is to be found in adjacent Kupeng land.

It seems quite likely that rudolphi is confined to secondary forests fringing the northern parts of the Pint Creek basin in Bokapai, Tsuwenkai, Kupeng, and Kompiai land. Evidence for its absence elsewhere in the study area is afforded by the general lack of knowledge of the bird outside the Pint Basin. It is possibly present to the west in Karam speaking parts of the Jimi (Bulmer, nd, 1), but this is not certain. It is not known to informants whether it is present in the Simbai valley.

The single specimen seen at Tsuwenkai was observed in bush fallow amidst gardens and homesteads. This does not appear to be unusual. Informants asserted that rudolphi did not frequent montane forest at Tsuwenkai. At least two different birds were heard on one occasion in advanced secondary forest at about 1,890 m, where I was shown a tree about 30 m high, standing alone in a clearing, which was said to be the display tree of a male rudolphi. The species was said to be rare; plumed males particularly so. This seems always to have been the case, although perhaps slightly less so in the past. While previously it was said to be hunted for its plumes, this seldom seems to be the case now, although one man stated that if he obtained a shotgun he would shoot a male whose display tree he had claimed. Possibly hunting pressure is one reason for rudolphi's present rareity. Another reason could be that

the optimal ecological requirements of the species are not satisfactorily met. For, as Schodde and Hitchcock (1972:84) state, rudolphi appears to depend upon "large stretches of primary forest on gently sloping or flat land surfaces between 3,500 and 6,000 feet altitude [1066 - 1980 m]". Certainly, there is very little, if any, primary forest between these altitudes within the Pint area. Against this, however, must be set the findings of Professor Ralph Bulmer (personal communication) who found rudolphi common in 1956 at Tari where corridors of surviving primary forest ran through gardens and bush fallow, and present, but not common in bush fallow at forest edges, and in patches of surviving tall timber on crests in the Baiyer Valley.

4.2.13 Pteridophora alberti

Within the study area this species is probably absent in land south of the Jimi, and also in Koinambe and Yimpegema land. The species was said to be common in Tsuwenkai land, where on one occasion at about 2,140 m in disturbed primary forest, calls were heard from a nearby gully which were attributed by Maring companions to this species. This was about 1.6 km to the north west of the settlement. The species appears, however, to be more common at greater distances from human settlement.

In Bokapai forest at about 2,223 m, several birds were heard calling which an informant identified as the female of this species. Although the calls heard were also said to be uttered by males, my informant said he could identify the sex because males were not found so close to settlements (about 1 km away), but only in more distant, less frequently visited sections of montane forest.

While Pteridophora was said to be common in Kupeng land, it appears to become less common further upstream, with the possible exception of Ndega.

The overall pattern, then, appears to be one of relative commonness in montane forests at the edge of the Pint Basin, becoming uncommon to moderately common elsewhere in the study area with suitable habitat.

4.2.14 Access of Local Populations to Paradisaeidae

Listed below under settlements are the various species of Birds of Paradise known or presumed to frequent respective territories including land in the Ramu fall, a rough index of their status, and the ecological zones in which the birds are generally to be found.

On average, each settlement has seven species occuring within its territory. Of the 12 Paradisaeidae present in the study area, which are exploited for plumes, only six are considered of value. These are the two Epimachus species, the Astrapia, Lophorina, Paradisae minor, and Pteridophora. All but Paradisaea are montane forest birds, while Lophorina frequents both montane forest and the zone of human habitation. Thus, only those settlements with territories extending into montane forest (see section 3.3) have access to a majority of valued Paradisaeidae. All but Tsuwenkai have access to Paradisaea. It is settlements with access to montane forest, then, which tend to have a greater potential for exploiting Paradisaeidae to provide for the needs of their own population as far as decorations are concerned, and for trading of plumes for other articles of utility or value. This will be examined more fully in section 9.

4.2.15 Other Species Utilized

Casuarius spp. The Dwarf Cassowary, C. bennetti appears to be a common species in all three zones, and in Narak and Kandawo speaking areas many are kept in homestead areas as wealth items. Few captive cassowaries were seen in Maring areas, and it is not known if this is due to lesser numbers of wild birds or to a lesser cultural emphasis

Table 5

Access of Local Populations to Paradisaeidae.

Species		Bokanai	Yimpegema	Tsuwenkai	Kompiai	Koinambe	Kupeng	Kwima	Ndega	Togban	Kwiop	Koriom	Mogine	Kelunga	Kosap	Bubgile	Tabibuga	Tsinggoropa	Kwibun
Manucodia ?chalybatus	2										+b					+b	+b		
Epimachus fastosus	3	+c	-	+c	+d	-	+c	+d	+d	+d	+c	+d	-	+d	+d	+d	-	-	-
E. Meyeri	3	+d	-	+d	-	-	+d	?	?	-	?	-	-	-	-	+d	-	-	-
Astrapia stephaniae	3	+b	-	+b	?	+c	+c	+d	+c	+c	+c	+b	+d	+d	+c	+b	-	-	-
Parotia carolae	2,3	+b	?	+b	+c	-	+b	+b	+b	+b	+b	+b	+b	+b	+b	+b	?	?	?
?Pa lawesi	2,3	+c		+c	?	-	?				-								
Lophorina superba	2,3	+a	?	+a	+b	?	+a	+	+	+	+b	+	+	+	+	+b	?	-	?
Diphyllodes magnificus	1,2	+	+	?	+b	+b	+b	+b	?	+	+b	+	+	+	+	+	+	+	+
Cincinnurus regius	1	+	?	-	?	+	?	+	+	+						+b	?	?	+
Paradisaea minor	1,2	+a	+a	-	+b	+a	+b	+b	+a	+a	+a	+a	+b	+b	+b	+a	+a	+a	+a
P. rudolphi	2	+d	?	+d	+d	?	+d	-	-	-	-	-	-	-	-	-	-	-	-
Pteridophora alberti	3	+b	-	+b	+c	-	+b	+c	+b	+c	+c	+c	+c	+c	+c	+c	-	-	-

Legend: + = Present, - = absent, a = very common, b = common, c = uncommon, d = rare.
1 = lowland forest, 2 = zone of human habitation, 3 = montane forest
? = probably/possibly occurs
Blank = no satisfactory data

placed on the ownership and prestation of the birds.

In Koriom and Bubgile, immature specimens of what is probably the Single-wattled Cassowary, C. unappendiculatus were seen. These had been obtained as young chicks in the Ramu fall territory of Bubgile, where the species appears to be common.

Henicopernis longicauda. This is an apparently fairly common large hawk, possibly more common upstream from Kupeng than elsewhere.

Harpyopsis novaequineae. This large eagle was not observed in the area. As in the Kaironk Valley (Bulmer, nd, 2) it is probably rather uncommon. Hunting pressure may in part account for its scarcity, although, feeding upon larger game as it does, a large area is probably required to provide for each individual. This in itself would tend to render the species thinly distributed.

A number of other hawk species are utilized for their feathers, although these have not been identified. A list of hawks, eagles, etc. to be found in the study area is given in Healey (1972). Several of those species listed probably provide feathers for decorations.

Sterna sp. The wing of a large tern is represented in the plume census sample. This had been obtained by a man from Kwiop while he was in Madang.

Ptilinopus superbus and P. rivoli. Both fairly common, small green pigeons, encountered in the zone of human habitation. Apart from the decorative green wings of these birds, the flesh is also much prized.

Goura sp. The Crowned Pigeon was said by some informants to occur in the lower Jimi (cf, also Bulmer, 1968a). It was also said to be found in the Aiome area, and probably also in the Asai, and Ramu valleys.

Pseudeos fuscata. While one of the most commonly observed parrots in the montane forests of settlements flanking Pint Basin, this species appeared to become increasingly uncommon with distance upstream.

Trichoglossus haematodus. A common bird of lowland forest and the zone of human habitation. Large, noisy roosting flocks were particularly noticed at Kwima. This parrot seemed rather more common in the eastern part of the study area, and possibly replaces Pseudeos fuscata in this range.

Domicella hypoinochrous. Most specimens of this Lory represented in the census sample had been obtained in and around Rabaul by contract labourers who had bought or shot the bird there. A similar bird appears to frequent the lower Jimi and Ramu, according to informants. This may be the present species, or D. lory.

Charmosyna papou. In plume collections both the coloured and melanistic phases were represented, although coloured specimens were most common. Most coloured skins, however, had been obtained by contract labourers in the Port Moresby area. A number of informants stated that the coloured phase was "Papuan", the melanistic phase being "New Guinean". While most of the small number of papou obtained in the montane forest of the study area were melanistic, a few were of coloured specimens.

This species appears to be uncommon in the study area, and is probably replaced by the more common C. josefinae which has a lower altitudinal range (Rand and Gilliard, 1967:202,203). Although no specimens of josefinae were identified in the census sample, a number of unidentified wings and tail feathers probably belong to this species.

Charmosyna pulchella. Nine skins of this species have been identified in the census sample. All specimens had been obtained within the study area. No data is available as to the status of this species, which is probably mostly found in the montane zone and secondary forest.

Neopsittacus musschenbroekii. This is a common Lory of the montane forest and secondary forest, occasionally to be observed in woodland associations.

Cacatua galerita. A common bird of the lowland forest and zone of human habitation. Although it does not congregate into the large flocks frequently to be seen in Australia, flocks of up to twenty cockatoos were seen at Kwiop. These seem to be fairly large flocks by New Guinea standards (vide Rand and Gilliard, 1967).

Psittrichas fulgidus. Rand and Gilliard (1967:221) record the altitudinal range of this bird as 761-1,218 m. However, the species seems to be absent in the study area. Informants stated it was to be found in the lower Jimi, and Simbai Valley. I have records of four specimens shot by their present owners. All four birds were obtained in Ramu fall land claimed by Togban and Bubgile. Judging by the quantities of feathers of this parrot traded in from various Simbai settlements, the species is fairly common in the Simbai.

Larius roratus. Possibly rather uncommon, two specimens of what I took to be this species were seen at Kwiop, flying over lowland forest. It is probably much more common in lowland and secondary forest west of the study area in the lower Jimi and at lower altitudes in the Ramu fall.

Tyto alba. Individuals could be heard calling from patches of bush near homesteads on some nights. There seems no reason to suppose that this is an uncommon species.

The grassland-haunting T. longimembris, although present in the nearby Kaironk (Bulmer, nd. 2) and Wahgi (Hitchcock, 1964:362) does not appear to be present in the study area. Enquiries were specifically made as to the presence of a grassland owl, and informants' replies as to the habits and habitats of owls strongly suggest that they are referring to T. alba.

Collocalia ?hirundinacea. A plentiful bird, this swiftlet is mostly to be found skimming over all forms of growth in the zone of human habitation.

Tanysiptera galatea. This is a lowland bird, apparently not found much above 300 m (Rand and Gilliard, 1967). An informant from Kompiai, however, asserted that the species is present in Kompiai Jimi land and to be fairly common further downstream. This is some 200 m higher than Rand and Gilliard's altitudinal range for the species. Of the specimens of this species shot or trapped by their present owners, all were obtained from near Port Moresby by contract labourers or in the Ramu fall land of Bubgile.

Aceros plicatus. I have one record of the Hornbill for the study area, at Kwiop, where a specimen is reported to have been shot in the Nam Creek valley near the main settlement area. The species appears to be more common in the lower Jimi, the Simbai, and Ramu lowlands north of Bubgile.

Pitta erythrogasta. I have no sight records for this species, but from informants' accounts it seems to be a common bird of lowland forest. Records of specimens shot are from Bokapai, Kupeng, and Kwiop. Rand and Gilliard (1967:309) give the upper altitudinal range of this Pitta as 609 m. The lowest portions of Kwiop territory are at about the same altitude, and it is possible the species does not occur much above that altitude.

Amblyornis macgregoriae. Of the two specimens represented in the census sample, one had been shot in Bokapai land, the other having come in a bride price payment to Kwiop from either Tabibuga or Magen.

A disused bower of this species was examined in disturbed primary montane forest near Tsuwenkai at about 1,860 m. In montane-crest forest behind Kwiop, a total of five bowers were found, dispersed along the eastern

edge of a ridge running roughly north-south. Two of these bowers appeared to be disused and were probably constructed by males which built others of the existing bowers. A third was in the process of construction. These five bowers were spread out over a distance of approximately 230 m, at an altitude of about 1,874 m. It is not known to how many birds these five bowers belonged.

PART 3

5. HUNTING METHODS

This section recounts the strategies of hunting observed and elicited from informants. Information is presented only on strategies relating to the obtaining of Birds of Paradise and other birds valued for their plumes.

The inhabitants of the study area eat a wide variety of wild creatures, from insect lavae and butterflies to the largest game animals, the feral pig and the Dwarf Cassowary. An incomplete list of bird and mammal species to be found in the area is given in Healey (1972). Nearly all the species listed are probably eaten. Various taboos and restrictions apply to the consumption of many creatures. These will be examined briefly below.

For the purposes of the following discussion I distinguish hunting and trapping from collecting or capturing activities. The precise deliniation of these domains of activities is difficult to outline satisfactorily. Essentially the difference seems to lie in the differing degrees of technical knowledge and skills required to achieve success. Collecting, whether of invertebrates or small mammals or birds consists largely of seizing the opportunity to grab, stun, or otherwise immobilize the prey when it is come across. One may deliberately set out to obtain the prey, or come across it by chance in the course of other activities.

Capture can be seen as a refinement of collecting, requiring perhaps rather more in the way of skill or knowledge of a creature's habits. Capture carries a connotation that the prey is somewhat elusive. Where capture results from the chance discovery of a creature I would class the activity with collecting. But where capture follows the deliberate seeking out of the creature, involving a certain application of knowledge of the animal's habits, then I class the activity as hunting.

Another distinction between the two forms of obtaining prey is that hunting and trapping often involve the employment of weapons or devices, while collecting and capture do not demand such articles.

Trapping may be distinguished from hunting in that the actual capture of the prey does not depend on the presence of the hunter. Self-operating devices are triggered into action by the prey itself, rather than the hunter.

5.1 Hunting and Trapping Aids

5.1.1 Hunting Aids

The bow and arrow is the most commonly used hunting aid. Bows are generally made from the stem of the black palm. These palms are considered a valuable asset, although it seems that in former times the wood was traded to only a limited degree. Now that money has come, they say some men will buy wood to manufacture bows from. A number of such palms were observed in small groves amidst homesteads at Kwima. The material significance of the palm can perhaps be gauged from the terms applied to it. Its "specific" name in Narak is bɨna koimbɨ, literally 'bow-spear', and in Maring, bɨna, 'bow'.

The bow string consists of a strip of bamboo, cut from a variety with long internode sections. Several spare bow strings are often lodged in the rafters of men's houses as replacements for worn strings.

Many boys and some younger men may carry bamboo bows instead of the larger and more powerful black palmwood bows.

Arrow shafts are made from Miscanthus grass. Arrow heads come in three basic forms: a narrow cylindrical point often of black palmwood, a bladed point made from a piece of bamboo an inch or more in breadth, and a three or four pronged arrow of slender slivers of hardwood or bamboo. While used for shooting wild game the narrow pointed arrow seems to be considered by the people themselves to be

primarily for shooting men. The blade pointed arrow is described as primarily for shooting pigs and cassowaries, while the pronged arrow is mainly for birds and smaller mammals.

Most boys and youths and many men carry bows and generally a selection of all three types of arrows with them when wandering about settlement sites or in the bush. Pronged bird arrows tend to outnumber other types carried.

The few occasions on which I saw bows and arrows used, the shooters met with no success. Bird arrows, in particular when loosed, are often abandoned, since, if they miss their target they often sail on into thickets where they are hard to find.

Spears are presumably used in hunting, although other than a number of Maring men at Koinambe seen carrying spears which had been provided by a Papuan mission worker hunting a domestic pig which had broken into his garden, their use in hunting was not recorded, nor mentioned by informants.

In 1969 power was given to the Jimi Local Government Council to recommend eight shotgun licences per year (Minutes, L.G.C.[1]). At least one councillor stated (November, 1969) that councillors were the only people responsible enough to own guns. This seems to have been the general trend at least since 1969; that is, councillors have tended to vote other members of the council eligible to be issued licences. In February 1971, one Councillor took issue with this, arguing that people other than councillors should be recommended for shotgun licences. Council interpreters were mentioned in the reported speech (Minutes, L.G.C.) The issue was taken up by another speaker who remarked that now Councillors have

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1. Minutes of the Jimi Local Government Council Meeting, Tabibuga and Kol, September, 1968-April, 1972.

allocated themselves licences it is time the people got them too; if not "we will be defeated in the next elections". It was at this 1971 Council meeting, however, that the power to recommend the issue of licences was removed from the Council. All licences are now issued at the discretion of the Assistant District Commissioner for Tabibuga Patrol Post.

I have no figures for the number of shotguns owned by people of the study area. Currently there are none in Bokapai, Koinambe, Tsuwenkai, Kompiai, Togban, and Koriom. There is one gun owned by a Kwiop man and at least one in Kwima. Figures for other settlements are not known.

Bows and arrows and shotguns are the main hunting aids. Sticks and stones may be picked up and hurled, with varying degrees of accuracy, at perching birds. Sticks may also be used to bludgeon fleeing mammals, and leafy branches used as switches to knock swiftlets (Collocalia spp) to the ground. Hand operated snares or nooses may be used, as are fruit baits, to lure prey. Various mammals and birds are also caught by hand at their nests. Dogs are sometimes used in hunting, especially in the pursuit of wallabies. The appearance of a number of dogs suggests they are descended from the Papuan Wild Dog, Canis familiaris hallstromi. Most dogs, however, are of the "European type", many of which have entered the Jimi via trade links with the Wahgi or have been brought back by contract labourers returning from the coast. Many of these coastal dogs are undernourished; more so, in general, than the Papuan-type dogs. Dogs do not appear to be trained for the hunt, and for certain game at any rate, their usefulness is somewhat questionable, in that they are liable to make off with smaller prey if given the opportunity. These are the main forms of weapons or what might be termed "active aids" to effect the death or capture of prey.

Various aids which may be distinguished from the above by the term "static aids" are also used. Principally, these consist of hides and lures. Often these two aids are used in conjunction.

Hides may be built on the ground or in trees, depending upon the expected prey. Complexity of construction varies from a simple leafy screen on the ground, to a sturdily built tree hide, complete with four walls, floor and roof, access to which may be gained by a ladder running up the tree trunk.

Hunting aids of non material nature consist of the use of magic and in help from forest spirits. Some men possess magic to increase the numbers of valuable plumed birds. Others own magic to cause Paradisaea minor, Astrapia, and the Epimachus spp to congregate in one display tree. This magic may be performed at display trees already owned, or men may subsequently claim trees to which, they say, birds have been attracted by their magic. Among the parephenalia of the magical rite is a broken branch, planted at the base of a display tree. Besides being an integral part of the magical right, this branch also serves as a sign that the tree is claimed, thereby warning the unwary not to shoot birds belonging to someone else.

It is said that only those individuals who already claim display trees know the magic to attract birds. If it were not of such restricted availability, men say, then everyone would have access to valued birds and would soon shoot them out. Men generally pass on this magical knowledge to their sons or sister's sons.

Many younger men professed ignorance of spirits, saying these are things of the past before the missions came. However, there is no doubt that belief in spirits is still strong even among younger people, despite their protestations of ignorance. The influence of spirits on

hunting activities will be examined further in section 6.3. Of relevance here is certain information gained from an old Maring man in Kupeng. As final preparations approach for the konj kaiko, or "pig festival" (vide Rappaport, 1968:153ff for description of the ritual cycle), men go into the forest to hunt birds to provide themselves with decorations. On such occasions, spirits of the montane forest help men shoot Epimachus spp, Astrapia, Lophorina, and Pteridophora. It is not clear how the spirits help men. These are the spirits of ancestors slain in warfare, and during the coming kaiko (festival) pigs will be killed for them. They aid men to shoot plume-birds because they are pleased and grateful for the pigs to be killed in their honour.

There also seems to be the idea, though not verbalized, that the spirits help provide men with rich decorations so that the festivities associated with the konj kaiko will be worthy of the spirits. Good decorations also reflect upon the prestige of their wearer, as will be shown in a later section.

5.1.2 Trapping Aids

Traps may be set either on or near the ground or in trees. Bird traps are invariably set in conjunction with lures. Either a fruit bait is attached to a stick beside the trap, or the trap is constructed close to a naturally occuring cluster of ripe fruits. A common bait is the fruit of a vine sometimes cultivated in homestead gardens. The fruit is large, and an elongated pear shape. When ripe, the tough skin is vermilion, the flesh deep orange, and the seed cavity scarlet. This fruit is said to be irresistable to a wide variety of birds, including Paradisaeidae. Professor Ralph Bulmer (personal communication) suggests that the fruit is probably from the Trichosanthes spp. of vine.

Bird traps consist of a delicately balanced horizontal perch, held in position by a trigger. The weight of a bird

on the perch causes the perch to slip off the trigger, thereby permitting a pliable bent stick to spring upright. This spring tightens a noose around the bird's leg or neck, and drags it off the perch, to be held in midair till the trapper returns. Dead-fall or log-traps, a small scale version of the dead-fall traps used for pigs, are also used to kill Pitta sp(p), Tanysiptera, and, it is said, Cincinnurus. These traps are baited with insects.

Large spring traps are also used for cassowaries. A large hoop of flexible cane strangles the cassowary, or secures it round the body when it passes through the hoop, activating the trigger mechanism.

5.2 Hunting and Trapping Strategies

The different strategies outlined below and their definitions follow those outlined by Bulmer (1968b) in his review of hunting methods in New Guinea. Only those strategies employed in the hunting and trapping of Birds of Paradise and other birds valued for their plumes will be considered here.

5.2.1 Hunting

5.2.1.1 Stalking

This may be defined "as the covert approach by a hunter to free-moving or potentially free-moving quarry". Generally, this method seems to be used only opportunistically when a potential quarry is observed. Men and boys may engage in stalking activity on sighting a bird quietly perching in a tree. Often, they may not have set out with hunting in mind, and if unarmed may creep closer to the quarry and hurl stones at it.

Stalking, of itself, does not appear to be a very productive method. It seldom seems to be employed by those deliberately setting out to obtain game although

it may be used in conjunction with other methods.

5.2.1.2 Ambush

This term "is here applied to those strategies in which a stationary hunter waits for game to approach". Ambush tactics involve perhaps the most varied techniques of all hunting strategies.

As far as birds are concerned, the simplest form of ambush is for a man to conceal himself in the foliage of a fruiting tree and shoot birds that come to feed at it. One man in Koriom and another in Tsuwenkai claim to have shot Pteridophora in this way. More often, hides are built in fruit trees. Some hides are abandoned when the tree ceases to bear fruit, while more sturdy hides may be built in some trees and used for several consecutive seasons. Species obtained in this way include Columbidae (Pigeons and Doves), Psittacidae (Parrots, Lories and Cockatoos), Aceros plicatus (Hornbill), and many Paradisaeidae (Birds of Paradise), with the probable exception of Paradisaea minor. P. minor could almost certainly be shot at fruiting trees, although I have no records of this actually being done. Various restrictions on the hunting of minor (see section 6.2) generally seem to make men reluctant to shoot it at fruiting trees for fear of sanction by others who might lay claim to individual birds.

Those species indulging in spectacular courtship displays are often shot from hides at display areas. Most notable in this respect is Paradisaea minor. Temporary or semi permanent hides may be built in the branches of a minor display tree or in an adjacent tree. A bamboo tube with the internodes punched out may project through the wall of the hide. Into this tube is inserted an arrow, the tube guiding the arrow to its mark. Minor indulges in collective displays, and the hunter may bag several males in a single day. After each kill the birds are said to usually to take fright. However, they often return to

resume display when the hunter may shoot another bird. Often the hunter makes his way to the hide before sunrise so as to avoid frightening away any minor that may come to the display tree early. Astrapia stephaniae also indulges in collective displays, and the hunter may succeed in shooting several of these in a single day, too. Alternatively, visits may be made to a hide on several consecutive days, and a single male be shot on each occasion at the display tree.

Other Paradisaeidae of the study area do not indulge in collective displays. Epimachus, Lophorina, Parotia, and Diphyllodes species may all be shot from hides at their display areas, as is Paradisaea rudolphi. Some informants consider that Pteridophora does not display, although they described the sweeping motion of the occipital plumes attended by calling which, according to Gilliard (1969:188ff.) accompany display.

Of the Paradisaeidae, Parotia carolae is the only species recorded as being caught at its display area in a hand operated noose snare. Altho gh Diphyllodes displays near the ground, and descends to the ground to remove leaves and twigs from below its display perches, this species does not appear to be caught in hand snares. The bower bird Amblyornis macgregoriae is also caught in hand snares at its display bower.

Hides may be constructed by small forest pools of water, and birds shot that come to drink. This tactic is generally practiced only in the dryer season when many pools and natural soaks have dried up, thus forcing more birds to visit a limited number of permanent watering places. The hunter himself does not construct a pool and channel water to it, as has been described for the Wahgi people by Gilliard (1969:37). The hunter generally does not seem to have any particular quarry in mind at such hides. Invariably, it seems, the prey are birds, and I have records of Paradisaea minor, Astrapia, and

Lophorina shot in this way. Other valued species are probably similarly obtained.

5.2.1.3 Luring

Bulmer points out that luring is much the same as ambush tactics, except that the hunter takes action to entice the movement of prey within killing range.

Among peoples of the study area, luring of creatures is generally effected by the setting of a fruit bait, the hunter usually remaining concealed nearby in a hide. Bait may be suspended from a branch of a tree for birds, or hung from a pole thrust into the ground beside a horizontally placed perch. In this way, Epimachus spp., Astrapia, and Lophorina can be shot, as is probably Parotia spp. and Amblyornis. Alternatively, a hand operated noose snare may be set. The fruit most commonly used as a bait has been described in 5.1.2.

Imitation of bird calls is also practiced. Some individuals are quite adept at this, but in my own experience, most are somewhat indifferent. Small bush birds may be attracted by a squeeking noise produced by drawing in air sharply through pursed lips. The only occasion on which I observed this method of luring to meet with even mild success was at Koinambe, when a man imitated the strident cries of Paradisaea minor in response to an individual heard calling deeper in the bush. The bird appeared to be answering and moved closer, although it never came into view. Some Maring men of Tsuwenkai stated that this tactic could also be used on Astrapia stephaniae. Narak informants, however, asserted that they never imitated the calls of these two species in an endeavour to lure them nearer.

5.2.1.4 Besetting

Besetting involves the approach of the hunter upon the known resting place of the quarry. The animal may be concealed in its roost, nesting or resting place. Knowledge

of the resting place may be in respect of an individual animal. For instance, from prior observation, a hunter may have discovered the nest of a cassowary, and returns when ready to attack the bird at its nest.

Many birds, both adult and nestlings, are caught or shot at the nest. Juvenile hawks and eagles may be taken from the nest when almost ready to leave the nest. I have one record of the Harpy Eagle, Harpyopsis novae-guineae taken from the nest at this stage. It was kept alive by its captor on a diet of sweet potato and fruits until it inevitably died, when it was plucked for its plumes, and the claws removed to make a neck ornament.

Cassowaries are highly valued birds, particularly, it seems, among the Narak and Kandawo. When a nest is found it is kept under close observation until the chicks (usually two) have hatched. Then the hunter, often with aid, chases the adult from the nest, frequently at some risk to his safety, and captures the nestlings. These are kept in homestead areas and used primarily in bride price payments and in quite a lucrative trade to the Wahgi. Sometimes the adult cassowary is killed, although many informants stated that they preferred to spare it so that the breeding stock was not unnecessarily depleted.

Some birds are obtained at night in their roosting places. Late in the afternoon, for instance, a man will follow plumed male Paradisaea minor from their display tree to their roosts. There he waits till nightfall, when he shoots them with bow and arrow. A flaming bamboo torch held by a boy may be used to provide light.

5.2.1.5 The simple drive

This tactic involves the co-ordinated efforts of a group of hunters in flushing and chasing game. I have no good examples of the use of this method.

On one occasion when watching birds at Tsuwenkai, one of my companions threw a stone at a bird perching in the bush. His stated aim was to flush the bird in the hope that it would fly closer. His efforts were unsuccessful, but the method is probably used to good effect on occasion.

5.2.2 Trapping

Most bird traps are baited with fruit to act as a lure. Occasionally the lure may be a free growing fruit, but more often the trapper sets his own bait as well. The Parotia spp. and Amblyornis macgregoriae, however, are sometimes trapped at their ground display areas without the use of a bait. Occasionally, baited traps may be set at waterholes where birds are expected to gather. At other times they may be set in areas where certain desired birds are known or expected to occur. The fruit bait most commonly used (see section 5.1.2), however, is said to irristably attract the frugivorous Paradisaeidae in particular. Therefore, it is said, one does not need to be particularly careful to set up the trap within the known range of individual birds. The scent is said to travel great distances through the forest and draw birds to the bait. Dead-fall traps for ground frequenting birds are baited with insects. The bait may also attract certain arboreal species as well.

5.3 Seasonality of Hunting and Trapping

Hunting and trapping occurs through the year. Seasonal fluctuations of intensity seem to operate primarily in relation to different species.

Hunting[1] in association with waterholes generally is practiced only in the dryer season. Many men stated a preference for hunting in dryer times, since excursions into the forest are less uncomfortable. In fact, a considerable proportion of hunting does occur in the wetter season.

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1. In the following discussion, hunting will also denote trapping.

Most notable of birds hunted in the wet season are the Epimachus spp. and Astrapia stephaniae. Primarily this seems to be because display activity is greatest for these species in the wetter months. A further reason given by men of Tsuwenkai was that, since they tended to trade all plumes of these species out of the area, they needed to go hunting before Christmas each year. Christmas festivities are the only major, regularly occuring occasion for which sumptuous decorations are acceptable, and a number of men seem to increase hunting activity shortly before Christmas, and therefore during the wetter season, in order to obtain plumes.

Hunting of Paradisaea minor, on the other hand, seems to be concentrated during the dryer season when display activity is said to be more intense.

Seasonal variation in hunting of other Paradisaeidae at display areas has not been recorded. Species other than those listed above, however, seem generally to be shot or trapped at dryer season waterholes or at fruiting trees or at fruit baits. The fruiting of individual trees obviously occurs only at certain times of the year. It has not been determined, however, to what extent trees bear fruit in relation to wetter and dryer periods.

The capture of cassowary chicks is perhaps the most seasonal of all hunting activities. According to informants, cassowary chicks hatch about the same time as cucumbers bear fruit in gardens. Cucumbers are the first crop to mature in new gardens. Many new gardens were being cleared and planted in June-August, and during this time, many Narak men had captured cassowary chicks in the forest. In August I was brought a fresh cassowary egg in Kupeng.

5.4 Spheres of Competence.

A number of informants professed familiarity with only one of the two forested zones. Frequently, lack of knowledge of one zone corresponded with membership of a

clan which does not possess land in that zone. Thus, for instance in Kwima, if I asked a man of Pemban clan which does not own land in the montane forest zone, to tell me something about the Astrapia, he often replied "I don't know. I [i.e. my clan] only own land in lowland forest. You'll have to ask someone who owns land in high altitudes". The same response was often given by men of clans owning land only in montane forest if I asked about lowland forest birds. Some men, however, who belonged to clans owning land in both forested zones, nonetheless considered themselves more knowledgeable about and competent at hunting in one or other of the zones. In part, this seems to be related to the ownership of display trees of Paradisaea minor. Those who do not lay claim to minor trees necessarily must hunt for valued bird species in montane forest, since lowland forest supports no other species approaching the value of minor. Conversely, those men with access to minor trees may not feel the necessity to hunt in montane forest if their aims are merely the accumulation of valuable plumes. Minor is plentiful and fairly easily obtained, and can be used as an exchange item to obtain other valued plumes or other valuables which can in turn, be converted into other valued plumes by exchange.

Generally, however, an individual's sphere of competence often seems to boil down to personal preference. Some men simply dislike tramping about in the montane forest, preferring to keep to the dryer, warmer, lowland forest, while others evidently derive considerable enjoyment from hunting in the montane zone. Some men, indeed, do not seem to engage much in hunting at all, being content to devote most of their energy to gardening and social activities within the zone of human habitation.[1]

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1. Professor Ralph Bulmer (personal communication) suggests that men who do not hunt may rather be in a temporary ritual state when it would be dangerous to enter the forest, or are subject to personal prohibitions on eating and hunting wild game.

Certain individuals may be spoken of as specialists in hunting in that they are acknowledged to be particularly knowledgeable about game and to be successful hunters. Professor Ralph Bulmer (personal communication) is of the opinion that such specialists among the Kyaka Enga tend to be less important men. Kyaka "big men", and those aspiring to status in economic and political spheres are generally too busy manipulating wealth to engage in much hunting activity. This does not appear to be the case in the study area. Indeed, the acknowledged hunting specialist of Kwiop was also one of the leading Manga "big men" and the most prominent sorcerer.

5.5. Hunting Expeditions

Most hunting takes place on a fairly casual basis. A man may seek out game when he goes to the forest to cut himself wood suitable for a new axe handle, or if he is travelling by a forest track to visit relatives in another settlement.

If a man wishes to shoot Epimachus spp., Astrapia, or Pteridophora to provide himself with plumes, he must often deliberately set aside several days for a hunting expedition. Other valued birds of the montane zone, being more common and often to be found also in secondary forest nearer homesteads, are easier to obtain. Males of the long-tailed species and Pteridophora tend to live well away from settled areas in the more distant and seldom visited parts of the montane forest.

The Kundagai clan cluster of Bokapai told me that they often had to spend three to four days in the forest to obtain these species. Probably at least a day is spent to reach the habitat of these birds. At first, the hunting trails are fairly easy to follow, but once one climbs above about 2,200 m in Bokapai territory, and enters the less frequented parts of the forest, the trails become more overgrown and harder to follow. Even those

familiar with the forest may temporarily lose the trail. The rest of the time spent on these expeditions seems to be spent locating the birds, and discovering their display areas or favoured food trees. At these places a hide may be built from which to shoot the birds. Informants will give vivid descriptions of the hardships faced by the hunter. Hunger and cold are the most severe trials to be withstood. Often lonely and without adequate food, the hunter may have to spend several nights huddled in a leaky wet bush shelter without even the comfort and warmth of a fire since there is no available dry firewood.

Some of the more ardent hunters construct more substantial private hunting lodges in the forest. The leading Manga hunter mentioned in section 5.4 has made himself such a lodge near the display tree of an Epimachus fastosus. Near this lodge he has also shot Astrapia at a display tree he has claimed. Periodically such men retire to the forest to keep themselves informed of the habits and movements of the birds they plan to shoot. They may take cuttings of a few cultivated plants, such as Rungia klossii, with them and plant these about the lodge. Old lodge sites may be identified by small clearings tangled with low vegetation, in which a few garden plants manage to persist.

Some clans or sub-clans also have small hunting lodges in their montane territories. The Kulaka sub-clan of Kwiop, for instance, has a small hut on its land, capable of sheltering five or six people. A few stumps near this hut are decorated with the spoils of the hunt, Several Bush Turkey (Aepypodius arfakianus) eggs impaled on a stick, and skulls, mandibles, and pelvic bones of forest mammals.

On the Kwiop to Agemba track, on the descent leading to Nam Creek, a large tree was noted, beside which a sturdy pole had been planted. In the gap thus formed was a pile of leafy twigs resting atop a pile of mossy, compressed, decomposing vegetable matter. The whole pile was somewhat

over a metre in depth. It was explained that as the successful hunter returned from an expedition into the forest he added a sprig of leafy twigs to the pile as a signal of his success. The explanation given for this action was that passing travellers glancing at the pile would know that some hunter had made a kill. My informant denied that the pile had any ritual or supernatural significance.

It cannot be said that hunting expeditions are held into the lowland forest within the study area. Lowland forest is of more easy access than montane forest, and the hunter does not need to organize his time and resources to the same extent as the hunter in the montane zone. Paradisaea minor, feral pigs, and cassowaries are the most prized game of lowland forest. The man wishing to bag P. minor is not faced with any particular hardships. He need only build a hide at a display tree he has claimed and wait there in the early mornings or late afternoons to shoot his prey. Generally, homesteads are close enough not to require spending a night in the bush.

Substantial hunting expeditions are mounted to the more distant lowlands or the Ramu fall, however.

Men of the westernmost Bubgile clans may take up to three days or more to reach their lowland forests in the Ramu fall. In this land, pandanus palms have been planted in ancestral times, and the hunters prepare small gardens of taro and sweet potato. The gardens prepared, they return to Bubgile while their crops mature. Parties of up to ten men may return to the Ramu land, spending as long as two months. During this time they live off the products of their small gardens, pandanus fruit, and wild game.

The primary game of these Ramu expeditions are Paradisaea minor, the chicks of the large Cassowary Casuarius ?unappendiculatus, and cuscuses (Phalanger spp.) which are valued for their pelts.

Some men travel considerable distances in the Ramu, particularly to obtain cassowary chicks. One Bubgile man claims to have walked as far as Usino some 60 km (40 miles) or more away. The same man says he has also been to Madang in search of cassowary chicks, travelling by foot through the Ramu lowlands, and by boat, and truck. While he obtained most chicks by trade, he did capture some himself in the forest.

5.6 Effects of Hunting on Bird Populations

This has been touched upon in section 4, and little need be added here. Those species apparently most seriously affected by direct pressure from man in the form of hunting are the two Epimachus species, Astrapia stephaniae, and Pteriodphora. As the numbers of these species decline, however, fewer men are prepared to take the time and effort involved to find and shoot them. Many men when asked if they hunted these species replied that they did not. Some added that they set traps for them, since this involved less effort. Others did not even do this. In effect, then, hunting pressure on these species seems to be declining. It cannot be determined from the available data if the species can maintain their numbers under the present rate of predation. However, it is my impression that these species are not in immediate danger of extinction. In section 4 it was noted that their numbers are greater in the western part of the study area, where human population density is lower. Similarly, by informants' accounts, these species seem to be relatively common in the more easterly parts of the Simbai Valley. That is, where human population densities are greater in the upper Jimi and upper Simbai, there are fairly large refuge areas north and south respectively of the Bismark Crest where populations of the birds may survive.

One of the major natural resources of the study area is Paradisaea minor. As will be shown in the discussion on

trade, considerable volumes of this species are traded in the Jimi. Many of these trade plumes are of birds shot in the Jimi. One factor which probably reduces hunting pressure on minor is that display trees are individually owned. Most complete figures for the ownership of display trees are available only for the Manga of Kwiop. Twenty-five Manga males own a total of 51 trees. The estimated total minor population for Manga territory is 1,000 birds (see section 4.2.11) which means that each individual claiming display trees controls an average of 40 birds each, or 4.4 adult male birds. On the basis of sex and age ratios of the minor population given in section 4.2.11, then for every 4.4 mature males there will be 8.8 immature males. These immatures take about 5 years to reach maturity. Thus, the number of immatures reaching maturity each year is 8.8/5 = 1.76 for each mature male. Therefore, to maintain the minor population at its present level, the hunter cannot shoot more than 1.76 mature males per year. That is, his rate of hunting mature males cannot exceed the rate of development of immature into mature males. At this rate of hunting, all mature males will be killed within 2.5 years of reaching maturity (4.4/2.5 = 1.76). Thus, in round figures, each man who claims display trees can shoot, on average, no more than two minor per year if the numbers are to be maintained. This rate of predation assumes that only mature males successfully breed. Female-plumaged immature males of the related P. raggiana have successfully bred in captivity (Gilliard, 1969:227). Presumably immature males can only breed in the absence of competition from mature males. If immature males of wild minor are also able to breed, then overcropping of mature males need not lead to a decline in overal bird numbers. Such over-cropping will, however, lead to a reduction of the number of plumed males for a time, although the breeding

of immature males would restore the number of plumed males to its "normal" level in the future.

When one considers that those men claiming trees must also provide minor plumes for those not owning display trees, since restrictions generally prevent non-owners of display trees from shooting minor (see section 6.2), this does not seem to be a very high rate at which to supply the human population with minor plumes.

A comparison of hypothetical figures for access to display trees for the total adult male population (i.e. 16 years old and over) of those ten settlements where plume censuses were made, with access to display trees calculated from the total adult males for the census sample suggest that in fact those with access to display trees do not make a significant contribution to the supply of minor plumes for those without access to display trees.

The adult male population of the ten censused settlements is 2,141 while the corresponding minor population for Jimi land is 5,400. At a ratio of 8 immature and female birds to each adult male, this gives a total of 600 adult male minor. Since each man who claims display trees has access to an average of 4.4 mature males, then the number of men claiming display trees is 600/4.4 = 136. The total number of adult male minor which can be shot each year while allowing the minor population to remain at its present level is thus 136 x 1.76 = 239.36. Thus for every one man with access to minor there are 2,141/239, or 8.9 men with no access. That is, about one man in every nine can shoot minor himself with no restrictions.

Turning to the figures from the census material, of the 185 individuals whose collections were censused, 163 are males over about 16 years of age. Only 14 of the 92 plumes of minor represented in the sample of 163 collections seen had been shot by their present owners in the Jimi land. Thus for every minor plume owned by its original shooter there were 163/14, or 11.6 men without plumes obtained in this way.

This latter ratio, 1:11.6 as against 1:3.9, suggests that in reality those claiming trees have to supply a greater proportion of the male population with minor plumes than is suggested by the hypothetical figure worked out for the total male population from which the census sample is drawn. Several factors operate to reduce this ratio. The above calculations do not take into account minor populations of the Ramu fall, and a number of men represented in the census sample, who while claiming display trees, did not have any minor plumes in their possession at the time censuses were carried out. Moreover, some males consider themselves too old to participate actively in ceremonies and do not desire to possess plumes of minor. Since minor plumes can be kept for several years, stocks need not be replenished yearly. The actual number of men not claiming display trees which each owner of display trees must supply with minor plumes is therefore probably in the vicinity of five or six, rather than ten or eleven. And since some men obtain minor plumes by trade or gift from areas beyond the study area, the ratio may be further reduced, perhaps as to low as 1:3 or 4. Thus, hunting pressure on the birds may be less than otherwise expected.

Informants generally consider that the local cassowary species, Casuarius bennetti is plentiful. Although I have no figures, quite large numbers of cassowary chicks are taken each year, especially in Narak and Kandawo areas. Since the cassowary inhabits all three zones there is a larger area of land capable of supporting these birds than for any other of the valued bird species of the study area. Interestingly enough, while Rand and Gilliard (1967:21) state the usual clutch size is three to eight eggs, informants were firm that in the Jimi the cassowary usually lays two eggs, and only occasionally three. Although adult cassowaries

are hunted and killed, many informants stated that they preferred to leave adult birds alone so as not to deplenish breeding stocks. It is probably this voluntary restraint which prevents the decline of cassowary numbers.

6. RESTRICTIONS ON HUNTING

Traditional hunting rights and restrictions still constitute the most significant constraints upon hunting activities. While the Nazarene missionaries at Tsinggoropa and government personnel at Tabibuga have placed a ban on all hunting within the boundaries of their stations, such restructions close off only a very minor proportion of the total land area to hunting activity.

The Jimi Local Government Council has instituted a number of rules relating to hunting. These will be examined in section 6.5.

6.1 Group Territorial Rights

Certain aspects of territorial rights have been dealt with in section 3.3. This section will serve largely as an elaboration of points made in that section.

6.1.1 Outline of Group Territories

Each clan cluster occupies a discrete territory with well defined boundaries. For the most part, boundaries follow natural formations, these usually being water-courses and ridge crests. Boundaries in more distant parts of the montane zone are sometimes rather more vaguely defined. Most, but not all clan cluster territories stretch the full altitudinal range from the Jimi River to the Bismark Crest. Amberakwi and Cenda land does not extend to the Bismark Crest, while Isemban land does not reach as far as the Jimi.

Most clan cluster territories are further subdivided into clan territories. These in turn may be subdivided into sub-clan and even subsubclan territories. Within the zone of human habitation much of the land is ultimately claimed by individuals. Rights to such land are inherited patrilineally, each adult male of the clan cluster laying claim to garden land which has been cut from primary forest

by a patrilineal ancestor. In the event of there being no lineal heir or appointee to such land, rights tend to revert to the subclan of the last claimant. Immigrants and refugees from other clan clusters may be given rights in perpetuity to garden land (see section 1.3).

As far as the exploitation of birds and certain other natural resources are concerned, territorial divisions below subclan level are of little relevance. Individual rights may still be of significance, but these are, in the majority of cases, not rights to territorial areas, but to the actual exploitable resources themselves (see section 6.2).

Shown below in Figure 3 are the territorial divisions, in diagramatic form, relevant to the following discussion. These relate to only nine of the clan clusters of the study region.

Figure 3
Clan Cluster Territorial Divisions

Legend: Names in capitals are of clans or clan clusters

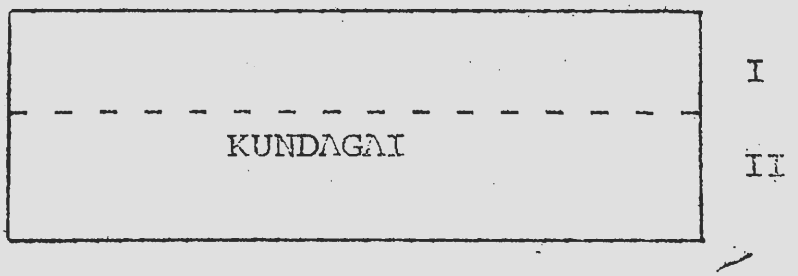
Names in lower case are of subclans.

Names indicate which structural level of each local group lays claim to land. Thus, where a subclan name is entered, the subclan is the smallest unit claiming territory, and where a clan cluster name is present, the land is not further subdivided among the structural units of the local population.

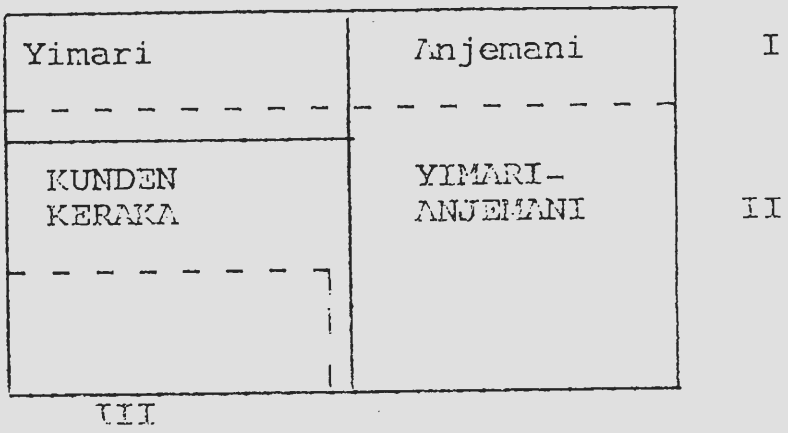
I indicates montane zone
II indicates zone of human habitation
III indicates lowland zone

Relative sizes of territories and ecological zones are not drawn to scale.

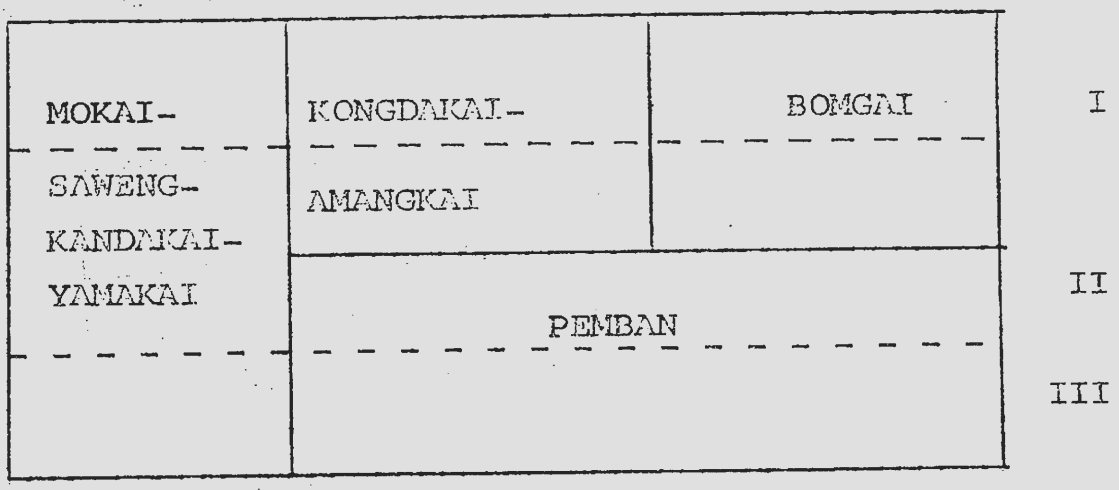
1. Kundagai of Tsuwenkai



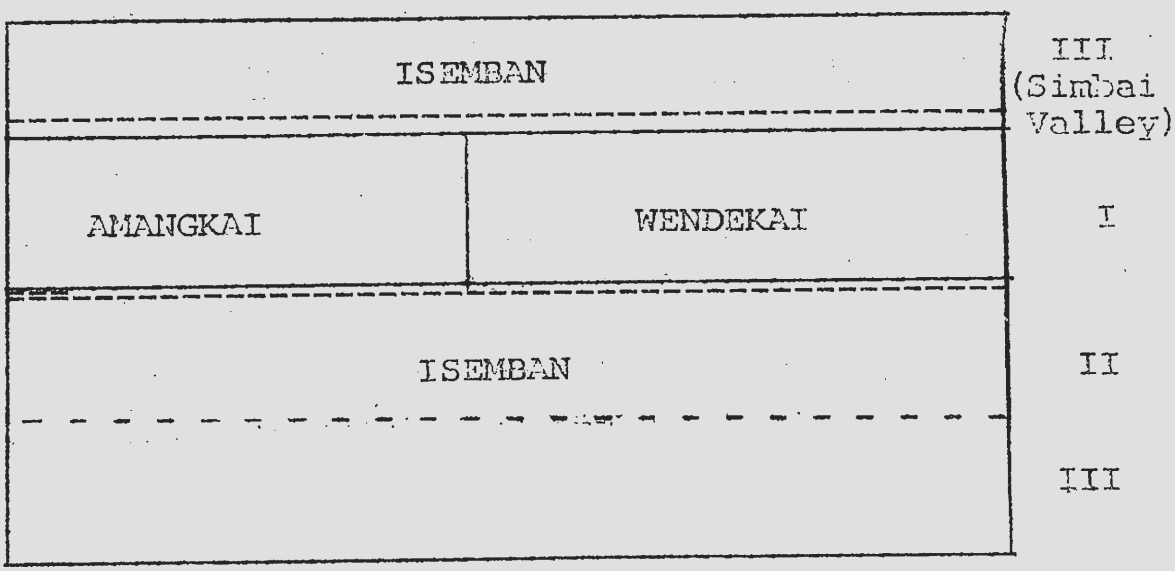
2. Manamban



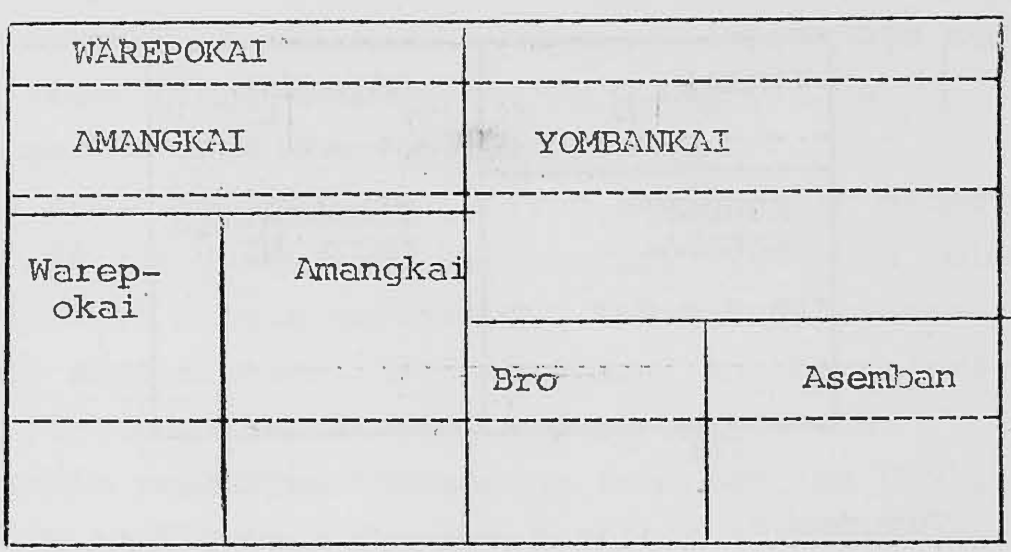
3. Tugumenga



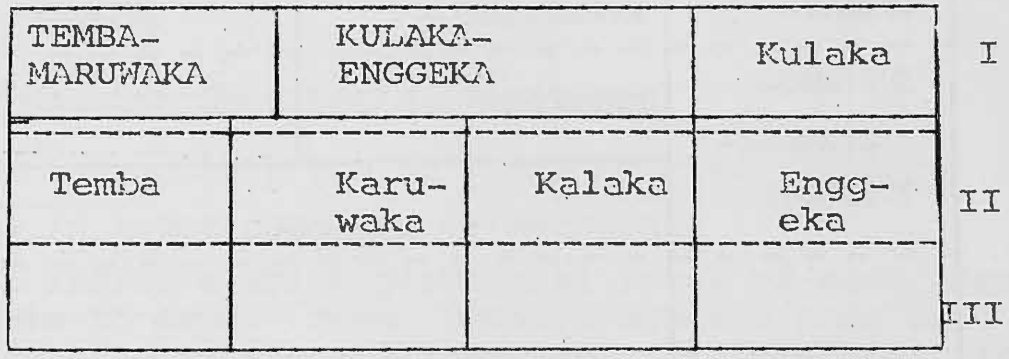
4. Isemban



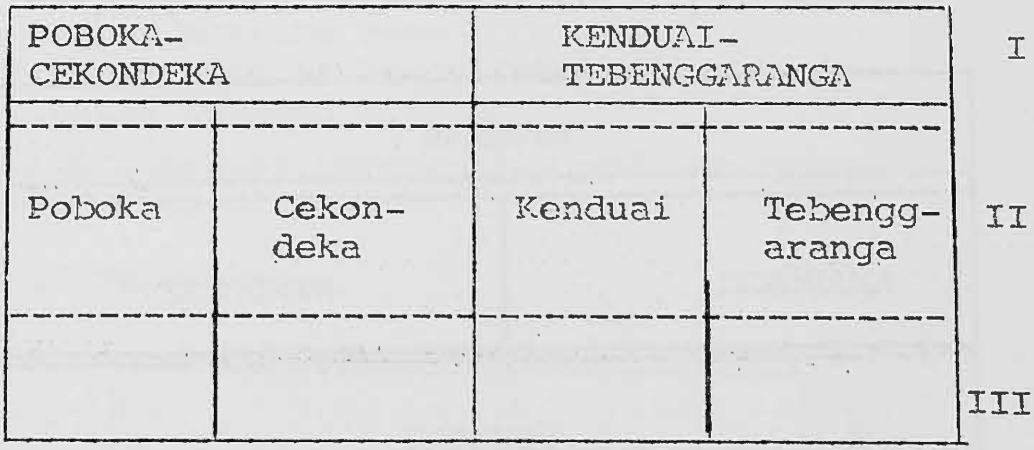
5. Yomban



6. Manga



7. Ogona



8. Kaureba

KAUREKA		I
LOMBA-NAUMBA	PENEOMBA	II
		?III

9. Kamam

	AINDEM	
	DARLKA	
	TUNKA	
AGELEKA	Wunjekan Kulangkan Kebengkan	AGELEKA
Olekani Kulekani Kundelekani	Olekani Kulekani Kundelekani	KUMNOKA
III	I	II

(Ramu Fall)

6.1.1.1 Kundagai of Tsuwenkai

In the montane zone there is only one territorial unit, equally accessible to the three clans of the cluster centred in Tsuwenkai. However, Kundagais of other settlements do not have any rights to this land.

No lowland forest occurs in the Tsuwenkai area.

6.1.1.2 Manamban

Only the Yimari-Anjemani clan has territory embracing montane forest, while the other clan of the cluster, Kunden-Keraka, claims all of the limited amount of lowland forest to be found within Manamban territory.

6.1.1.3 Tugumenga

The clans Mokai, Saweng, Kandakai, and Yamakai, which I have termed a cognatic cluster (see section 1.4), hold a single joint territory embracing the full altitudinal range and all ecological zones within Tugumenga territory. The Pemban clan has access to only lowland forest, while the Kongdakai-Amangkai and Bomgai clans have territories including only montane forest. Forested parts of Tugumenga land are thus subdivided into two territories in lowland forest, and three territories in montane forest. The montane zone is the more extensive.

6.1.1.4 Isemban

The Isemban clan cluster is one of the smallest in the study area, and is composed of the Amangkai and Wendekai clans. According to some Isemban informants, the two clans do not have separate territories in forested regions. The present Isemban Local Government Committee member, however, stated that while lowland forest in the Jimi and Simbai is not subdivided into clan territories, each clan holds separate territories in montane forest.

6.1.1.5 Yomban

The subterritorial divisions of lowland forest in the Jimi are not entirely clear. Two of the three clans constituting the Yomban cluster, Warepokai-Amangkai and Bro-Asemban, have territories in lowland forest. Each of these clans is made up of two subclans. These subclans also are said to have separate territories within clan land.

Three of the subclans further divided into subsubclans are said to have their own subterritories, the fourth subclan not being further segmented. This gives a total of eleven territorial divisions. However, it is not clear whether lowland forest is divided into these eleven territorial divisions, four subclan territories, or only two clan territories. In lowland forest in the Simbai Valley the only territorial subdivisions are of Warepokai-Amangkai and Yombankai clans. Both these clans also have separate territories in the montane zone. Bro-Asemban has no territory in montane forest.

6.1.1.6 Manga

In lowland forest, each of the four subclans of the Manga clan cluster have separate territories. In montane forest, both clans Kulaka-Enggeka and Temba-Maruwaka have separate territories. In addition, the Kulaka subclan of Kulaka-Enggeka claims a separate territory in montane forest. Territorial divisions are thus fourfold in lowland forest, and threefold in the montane zone.

6.1.1.7 Ogona

Each of the four subclans of the two Ogona clans was said to possess separate territories in garden lands and lowland forest. It is likely, however, that not all subclans in fact have access to lowland forest, as this zone peters out within Ogona land. Montane forest is divided between the two clans.

6.1.1.8 Kaureka

The zone of human habitation is subdivided into the two clan territories. Any lowland forest that remains near the Jimi probably occurs only in limited pockets. In the montane zone, Kaureka territory is not subdivided.

6.1.1.9 Kamam

All five clans of the Kamam cluster have territories embracing the two ecological zones in Jimi land, the montane zone and zone of human habitation. Of the three subclans of Kumnoka clan, the second largest clan (Village Population Register 1969), two possess a joint subterritory in the montane zone, the third holding a separate subterritory. It was said, however, that any Kumnoka can hunt within any part of Kumnoka land without restriction. The territory of Ageleka clan, the largest Kamam clan (Village Population Register, 1969), is subdivided into the three subclan territories in the montane zone. Here, Agelekas can hunt valued birds only within their subclan territories. It is not known if montane forest territories of the other three Kamam clans are subdivided.

In land claimed in the Ramu fall, all clans have separate territories. Kumnoka territory is subdivided into territories of each of the three Kumnoka subclans, and subclan rights to hunting on this land are guarded against infringements from members of other subclans and clans. Although data are lacking on this point, the Ramu land of Ageleka clan, and possibly of the other three clans, does not appear to be divided on a subclan basis.

6.1.2 Rights of Access to Different Resources

This section examines traditional rights of access to natural resources in relation to the territorial divisions outlined above. Rights claimed by individuals to natural resources will be discussed in the following section.

It is not easy to identify truly traditional conceptions of hunting rights. Since pacification there seems to have been some shifting in attitudes towards people hunting in the territory of other clan clusters. Traditional hunting rights are further obscured by a number of Jimi Local Government Council rules relating to hunting. These rules are said to be based upon traditional territorial rights,

but the enforcement of these rules is largely in the hands of individual councillors and Committee members. Individual office holders differ in their own views of these new rules. Council rules will be examined further in section 6.5.

Conceptions of traditional rights often vary from individual to individual. Almost certainly some individuals or groups would be tolerated if they hunted certain species in another groups' territory, while for other groups the territory holders would assert their exclusive rights over their territory and demand compensation for hunting infringements. On the clan cluster level, such differential prosecution of a clan cluster's exclusive rights to land seems to have reflected the traditional pattern of alliances and hostilities.

In general, each clan cluster of the study area was in an actual or potential state of war with its immediate neighbours in the Jimi. Friendly relations generally obtained between groups sharing hostile neighbours. Thus, for instance, the Manga had hostile relations with the Yomban and Manamban to the west, and the Ogona and Owelga to the east, and friendly relations with the Tugumenga, and to a lesser degree the Kauwatyi to the west, and the Kaureka and Kamam to the east. Friendly relations generally were maintained between clan clusters occupying opposite sides of the Jimi River or the Bismark Crest, although there are a few exceptions to this rule. The last wars in the Jimi seem to have been fought in 1956 (Vayda, 1971). Many of these old enmities are not yet resolved, and taboos still operate so that members of hostile groups cannot eat food grown in one anothers' gardens, nor sleep in each others houses for fear of being stricken with illness. Many present day prejudices are directed against formerly hostile groups. Some Manamban, for instance, still speak ill of the Kauwatyi and Tugumenga.

In times before pacification, any member of a hostile group found on clan cluster territory was liable to attack, whether he was hunting or not. He was attacked because he was an enemy rather than because he was infringing upon group rights.

Nowadays all men are ostensibly friendly, and informants did not state that members of formerly hostile groups found infringing upon the rights of other groups faced harsher sanctions.

In general, rights to natural resources of a clan cluster territory are held exclusively by clan cluster members. In actual fact, members of other groups may harvest certain resources, but almost invariably, such resources are of little intrinsic value. Thus, the traveller is free to cut vines for securing loads or poles to carry baggage. Generally, however, there is little call for members of other groups to extract valueless resources, since these are amply present in his home territory. As regards hunting, opinion varies somewhat. Some informants consider that hunting of any creature by members of other clan clusters is infringing upon the rights of the territory holders. Others consider that such people are free to hunt for valueless birds or animals. Some informants elaborated on this last opinion by remarking that travellers were permitted to shoot valueless birds or animals in the vicinity of the main tracks, but were overstepping this concession allowed them if they hunted in forests away from tracks. The idea behind such a restriction seems to be that non clan-cluster members hunting in the forest must be intending to shoot valued creatures, since there is no motivation to leave the tracks to seek the more retiring valueless birds and animals, and plenty can generally be found in the vicinity of tracks.

The number of species said categorically to be forbidden game for those with no proprietory rights in clan cluster territories is quite small. In Pidgin English

these forbidden species are described as all those which pulim mani (have monetary value). All these species are valued as providing fine decorations or as exchange items.

The most commonly named species which can be hunted only within the territory of a hunter's own clan cluster are listed below in Table 7.

Table 7
Prohibited game : Most frequently named species

Gasuarius spp
Epimachus fastosus
E. meyeri
Astrapia stephaniae
Lophorina superba
Pteridophora alberti
Paradisaea minor
Feral Pigs

Less Frequently named species:

Charmosyna papou
Neopsittacus musschenbroekii
Cacatua gelerita
Psittrichas fulgidus
Tanysiptera galatea
Parotia spp
Paradisaea rudolphi

Interesting omissions from these lists are the Hornbill Aceros plicatus, and various hawk species, especially Henicopernis longicauda and Harpyopsis novaequineae.[1] Although I omitted to enquire about these species, it is probable that they were prohibited game in the past, as the feathers of these species were widely used and of some value as decorations. They are now passing out of

1. For this species Professor Ralph Bulmer (personal communication) notes that both Karam and the Kyaka Enga land owners have acknowledged rights to birds occuring on their land. Similarly, nests of this species may be claimed by individuals, if the nests are discovered on land to which the individual has some kind of claim.

favour as decoration items, and are no longer considered valuable by many, which probably explains their omission from the lists extracted.

While hunting rights in clan cluster territories are held exclusively by cluster members (who may grant concessional rights to members of other clusters), all members may not have equal rights to resources of the different zones. That is, while all clan cluster members may object when men of a different cluster hunt on their land, many of these objectors themselves do not have free access to land and resources. This is effected by the distribution of clan and subclan territories. The distribution of clan and subclan territories in the two forested zones has been examined in section 6.1.1.

It seems generally to be the case that where clan cluster territories are further divided into clan and subclan territories all members of the cluster may nonetheless hunt throughout all parts of the clan cluster territory. Again, however, restrictions apply. As regards clan territories, members of other clans are permitted to hunt for and gather items of negligible value in the prestige economy. That is, they may extract timber for building, and hunt for birds and mammals whose value is largely in the subsistance sector of the economy or in their use as technological items. Thus, various cuscuses and possums may be hunted for food and their fur used to decorate string bags and their skins used for drumheads. Generally, however, such members of other clans are not extended the right to hunt for the more valued species identified in Table 7. In Bubgile informants stated that one may not hunt anything on the land of another clan. It is probably significant, though, that each Kamam clan holds territory in both forested zones. In no clan cluster does any clan appear to be totally prevented from exploiting the resources of all ecological zones. The range of items restricted is quite small. It is rights to the land itself which are most

asiduously guarded. No member of another clan or subclan may garden in the land of another clan or subclan without general approval of the land holding group or allocation of gardening land by individuals. It is infringements upon these rights which lead to the most serious disputes.

It was stated that in theory members of other clans or subclans cannot hunt restricted bird species on the land of others even without permission of the holders of these rights. In fact such permission is, on occasion, granted. Thus, for instance, in Kwiop, I was told that a Temba-Maruwaka clansman might, with permission, capture cassowary chicks on Kulaka-Enggeka land. In such a case the Temba-Maruwaka man is required to give at least one chick taken to a Kulaka-Enggeka man, plus a payment of money. If a man of Kulaka subclan wishes to capture cassowary chicks on Enggeka land, then, being members of the same clan, the payment required is said to be less. In Koriom I was told that a man may hunt valued birds on the land of another subclan, if he is helping a right-holder to the land in the hunt. I have several other examples of such hunting concessions being granted. Usually, however, it seems that the non right-holder must at least share some of his kill, and often must hand over all of it to a member of the right-holding subclan. In effect, then, such men are often working as unrewarded hunters for right holders, although some obligation is recognized on the part of the right holders to make some form of restitution in the future.

In general, subdivisions of clan cluster territory in the forested zones has little relevance to hunting except in relation to valued resources; that is, the land itself, and a few natural resources of significance in the prestige economy. These resources consist primarily of those bird species listed above. Thus, any member of the clan cluster has equal rights to hunting

in all lands of the clan cluster except in respect of valued resources. While it is only members of clans or subclans who hold collective rights to valued resources occuring within their territories, individuals of these groups themselves may claim exclusive hunting rights to some valued resources occuring on the land of their own clan or subclan (depending upon which of these structural levels claims the land).

6.2 Individual Hunting Rights

The foregoing discussion shows that all men generally have equal rights of access to resources of little cultural value both within and without territories claimed by the most exclusive social groupings of which they are members.

Where the various structural levels of a local population exercise exclusive rights of access to valued resources, individual members of the smallest structural unit possessing such rights may claim proprietory hunting rights over resources. As far as birds are concerned, these rights are established by claiming the display sites or nesting sites of the resources. That is, the individual does not so much claim individual birds, but those elements of the natural environment to which birds attach themselves for specific behavioural purposes. Thus, the claimant will not verbalize his claims by saying "I have claimed so many Paradisaea minor, and I can distinguish them one from another", but rather, "I have claimed so many display trees of Paradisaea minor, and all birds of the species which congregate at these trees are mine". The number of birds a man has exclusive hunting rights to may thus fluctuate as the birds are shot or die, and as new birds develop, or desert his tree for other display trees.

Individual rights to gardening land give an individual the right to claim valued birds occuring on his land. Membership of a subclan gives a man the right to claim birds occuring on subclan land. Similarly with clan land. But

an individual cannot claim valued birds occuring on another man's land, nor a man of one subclan claim birds on land held by another subclan, even if the two subclans are of the same clan. Thus, for instance, a man of Kulaka subclan of the Manga clan cluster may claim the display trees of Paradisaea minor only in Kulaka land, while any man of Pene-Omba clan of Kaureka clan cluster can claim display trees in Pene-Omba land, since this is not further subdivided. Similarly, any Isemban may claim display trees in any part of Isemban land, there being neither clan nor subclan divisions in these ecological zones inhabited by minor. The same is true for valued birds inhabiting montane and lowland primary forest. In these zones, where there are not areas of land claimed by individuals, there are no restrictions as to which parts of a territory an individual may claim display trees or nesting sites, since all parts of group-held territories are of free access to individuals of the group.

A man gains exclusive rights to display trees or nesting sites either by inheritance, usually from his father, or by claiming trees he himself has discovered. Some individuals also gain these rights by bestowal from relatives. For instance, one Manga man, Mon, of Enggeka subclan had claimed four display trees of Paradisaea minor. Of these he gave rights to two of them, one to each of his mother's brothers' two sons. Normally, a man is not of the same clan, let alone subclan as his mother's brother. Mon's father was of the Ogona clan cluster of Koriom. This man died while Mon was still an infant, however, and his mother returned to her natal home among Enggeka subclan of Manga. Thus, Mon was assimilated into Enggeka subclan, which is how he comes to belong to the same descent group as his mother's brother (now dead) and his sons.

It has been mentioned in previous sections that there is little hunting of Paradisaea minor away from

display trees. Men owning display trees are often aware of the number of mature male minor which gather at their trees. Even when exact numbers are not known tree claimants may quickly notice if fewer birds appear to be visiting display trees. It appears that display tree claimers are quick to accuse others of poaching birds which belong by right to the claimant. Several informants who did not claim display trees, remarked that they did not shoot minor because they would almost certainly be embroiled in a dispute with some tree claimant who would assert that the birds shot were by rights his. Moreover, informants would add, everyone knows where display trees are located, and everyone knows who claims each tree. Thus they say, the wanderer in the forest knows to whom each minor he sees belongs by knowing which man claims the closest display tree. There is no simple way of testing this assertion, However, it is not so important as a statement about the habits of minor, as it is about the safeguards upon the rights of display tree claimants. Minor is one of the most valued of natural resources, and, being fairly tolerant of man, one of the easiest of access. Consequently, it seems the boundaries of a claimant's rights are more clearly delineated for this species. Clearly, some hunting of minor does occur away from display trees, and by men who do not claim rights to display trees. It seems that a display tree claimant has, in the traditional jural conceptions, proprietory rights to all birds which gather in his display tree, but not to the same individual birds when they leave his tree. The same is generally the case with valued montane forests birds. Montane birds found away from known and claimed display areas are said as a rule to be fair game for any member of a group in whose territory the birds occur. Most men, however, especially those who claim display trees, are more familiar with the movements of minor, since their habitat is of easier access.

Moreover, many individual male minor are fairly easily distinguisable, even to the short-term anthropological investigator. Their range of movements and absence can be easily noted by those who claim to own the birds. Thus, when minor are shot by someone whom a display tree claimant considers has no rights to do so, the claimant is quick to argue that the bird shot rightfully belonged to him - because he recognizes it, and because it was shot near one of the display trees he claims. Of course, those who are accused with poaching will counter the charge by arguing that when the bird was shot it was not in a display tree, and therefore free game for those who came across the bird.

Should a minor to which a display tree claimant considers he has proprietory rights be shot on land in the territory of a group other than the tree claimer's group, informants state that the man who shot the bird has a right to do so. The reason given is that members of a territory holding group have sole rights to shoot valued birds found in that territory. Generally, however, the man who claimed the bird belonged to him alone disregards this principle. He asserts that the bird remains his property even if it strays from land claimed by his own descent group.

While it seems that in actual disputes over rights to birds no one questions the exclusive right of a display tree claimant to shoot minor found at his tree, many people will dispute the claimant's assertion that he still retains the exclusive right to shoot birds when they leave his tree. It is for this reason that one can argue that individuals claim sole hunting rights to elements of the environment at which they exercise their rights, rather than to individual birds.

Some individuals will permit other people to hunt at display trees of minor which they have claimed. Generally such people are relatives. An old man, while retaining

claims to his trees will allow his sons to hunt at them. It is expected that the man's sons from time to time give him some skins of birds shot at those trees. A man may also permit brothers, mother's brother's sons, or sister's husbands to shoot the odd bird at his tree. Occasionally unrelated men may be permitted to make use of another man's display tree, although such a hunter is seldom allowed to keep for himself the plumes of any bird shot.

I did not come across any instance of the practice which was described to me by Kyaka Enga of Baiyer River. Among the Kyaka, a man with no claims on display trees of minor may approach another, who does have such claims, for permission to shoot birds at his tree. The arrangement is essentially a commercial one. The hunter must pay the tree claimer the current market value for any birds he shoots. The cash value of minor in the Baiyer River area, as at August, 1971, was $6-10. Informants categorically denied that one could obtain minor in this way in the Jimi. This does not rule out the possibility of the practice occuring sometimes. At least one man is known to hire out his shotgun and the services of a hunter to those who wish to shoot minor. The general rate is $4 for each minor shot. These must, however, be shot at trees claimed by the hirer of the gun.

Individuals also claim nests of cassowaries found in the forest. Such a claim may be signified by the planting of leafy branches at intervals along a track near the nesting site. Again, a man may simply announce that he has claimed such a nesting site, and describe its location.

Nowadays, disputes over claims to ownership of valued birds generally find their way to a hearing before a Local Government Council committee member (p.e. komiti) or Councillor (p.e. kaunsil).[1] These disputes are usually

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1. In the following pages where I am referring to individuals I shall refer to them as Kaunsil and Komiti.

settled in local courts (Pidgin English Kot). Some examples of such disputes are given below in section 6.5.5.

It has been shown above that individuals claim exclusive hunting rights to valued birds occuring on patrilineally inherited gardening land. I have one instance only of an individual claiming such exclusive rights in montane forest. This was at Tsuwenkai, where the Kaunsil, who has held the post since the establishment of the Jimi Local Government Council in 1966 has claimed for himself an area of land in primary montane forest as his personal hunting reserve. In this land, other Tsuwenkai Kundagai may hunt for a variety of birds and animals exclusive of Epimachus, Astrapia, Lophorina, Pteridophora, and various fur-bearing mammals. Such a claim does not appear to have any traditional precedent. Professor Ralph Bulmer (personal communication) suggests that the Kaunsil may be arguing on Karam precedents. The Kaironk Karam, he notes, recognize just such kinds of individual rights, expressed in terms of rights to Pandanus. In connection with this possible interpretation, it may be of relevance that the Kundagai clan cluster, including the settlement of Tsuwenkai, are adjacent to Karam groups. It is probably largely because of his position that the Kaunsil could successfully lay claim to this land. Many people stand in awe of Kaunsils whom they imagine to be in close contact with kiaps and influential with Administration personnel. In many cases these conceptions of Kaunsils are unfounded. Kaunsils, however, often stress how they are backed up and supported by the kiaps, and the kiap still appears to be viewed as the undisputed authority in the Jimi.

6.3 Taboos and Supernatural Restrictions on Hunting

Information gained on taboos and supernatural restrictions is by no means as complete as it could be. In large part this is because of the general reticence of people to talk about these subjects with a short term investigator, who, they may feel, may be inclined to laugh at their beliefs. Many younger and middle aged men would avoid discussing taboos and spirits by stating that they really knew very little about such matters. A common response was, "We are all Christians now, and these things no longer concern us". Several old men seemed willing to talk about taboos and spirits, but since very few older men could speak Pidgin there was the problem of gaining accurate translations of a somewhat complex belief system.

Among the Maring koi ma (marsupials and rats) are spoken of as the pigs of spirits of the kamungqa or montane forest. These are the spirits of those killed in warfare. It is said that if men are greedy and kill large numbers of koi ma the spirits will be angry, and strike the hunter or his wife or children with sickness, and may even cause death. The hunter is free to shoot or trap small numbers of koi ma. Rappaport (1968:151) notes that during certain stages of the pig feast ritual cycle, a taboo is imposed on the trapping of koi ma. He suggests that such a taboo probably is sufficient to permit the recovery of animal numbers after periods of exploitation. He goes on to note (1968:156) that the year long pig festival, or kaiko, which terminates the ritual cycle occurs on average, every twelve to fifteen years. The mammal population, therefore, is given a respite from trapping only infrequently. Preparations currently underway towards a pig festival in a number of Maring and Narak populations may well mark the last of such festivals to be staged in the Jimi.

Various ritual specialists must observe taboos on the consumption of animals. Thus, for instance, Maring and

Narak men who perform magic to ensure bright decorations are forbidden to eat various mammals. (Information is lacking for the Kandawo on this point. One young man asserted that this taboo operated throughout the Jimi). Those mammals exuding an unpleasantly powerful smell are said to be prohibited food to the magicians. A further criterion of the prohibited class of mammals seems to be those with dull fur. Should this prohibition be ignored, it is said that the effects of the magic will be reversed - the poor fur quality and odour of the animals consumed will be metaphorically transferred to headdress decorations, rendering them dull in colour, unexciting, and an object of scorn to others. Those species forbidden to the headdress magician are:

Phalanger gymnotis
Phalanger vestitus
Dorcopsulus vanheurni
Dendrolagus goodfellowi
Dobsonia moluccensis
Nectar and insect eating bats.

All species of koi (smaller rats and marsupials, see Healey, 1972 for an incomplete list of species) also appear to be forbidden.

Individuals impose upon themselves taboos on eating various species of wild game. Such taboos generally seem to be adopted for health reasons. A man considers a particular creature will cause him sickness if he eats it. Some of these taboos may operate for several generations and embrace large numbers of living men. Thus, for instance, all males of the Mokai and Saweng clans of the Tugumenga cluster of Kwima have a prohibition on the eating of all bird species. Mokai and Saweng are in the cognatic cluster of Mokai, Saweng, Yamakai, and Kandagai clans. It is said that Mokai and Saweng share a common ancestor. This ancestor, or one of his descendants, is said to have died from eating birds, from whence derives

the taboo. This taboo, however, does not constrain Mokai and Saweng men from hunting birds for their plumes or for meat to be given to wives and female members of the clans, who are not subject to the taboo.

Unlike mammals, birds of the montane forest are not "pigs" of the spirits of the forest. They can, therefore, be hunted with impunity. Indeed, as has been shown in section 5.1.1, the forest spirits at times even aid men in the hunt for various species.

Certain areas of lowland forest, however, are inhabited by spirits, whose imputed presence does appear to influence hunting of birds as well as mammals. The following information was gained from Narak and Kandawo informants. These spirits, kondle tanji in Narak and kibi tanje in Kandawo inhabit the more distant, seldom visited regions of lowland forest. Their Maring equivalent appears to be koipa manggiang (Rappaport, 1968:38), although I have no information from Maring speakers concerning these spirits.

While having the appearance of man, these spirits were never human. They are described as uncontrollably wild, and they seem to be much feared by men. Some say these spirits are not found in Jimi land within the study area, but occur only in the humid forests of the lower Jimi and the Ramu fall. Other informants say these spirits do reside in the study area, but are familiar with man and cause him no harm. Possibly these less harmful Jimi spirits are of a different class.

All wild creatures, including birds, are the "pigs" of the wild forest spirit. The spirit will tolerate the killing of moderate numbers of its "pigs", but is roused to anger if many are killed. It goes abroad at night to seek its revenge. The spirit attacks only lone men, shooting them with its bow and arrows as they sleep. It then devours its victim's internal organs.

While I was staying at Bubgile a party of men returned from a hunting expedition to the Ramu fall, and announced

that a young man of their company had been killed by a kibi tanje. The indications for death caused by the spirit are the sudden death of the victim, who shows no external wounds, and a stinking abdominal cavity where the spirit has eaten away the organs. One Bubgile man aged about 30 stated that this was the sixth death caused by kibi tanje in the Ramu fall to his knowledge.

Fear of this spirit does appear to induce men to exercise some restraint in hunting activities in the Ramu. As one Manga man, who was present in Bubgile when the death described above was announced, said to me, "Ating ples bilong/ka yambali/olsem ples bilong massalai".[1] My Narak interpreter remarked, somewhat parsimoniously, that men will bring such disaster upon themselves for their greed to acquire many Paradisaea minor for trade and sale.

6.4 Voluntary Restraints

It has already been noted that some informants stated that they do not hunt adult cassowaries, so as not to deplete the breeding stock of the species. This restraint is deliberately conservatory, with the idea of allowing for continued capture of cassowary chicks.

A number of men stated that they also exercised restraint in their hunting for other valued bird species. This seems to apply exclusively to the most valuable species. Less valued birds are generally less actively sought, or are relatively common, and not therefore subjected to heavy hunting pressure. Thus, there is little hunting of the rather uncommon Charmosyna papou which is difficult to obtain in the forest but easily come by through trading for skins obtained outside the study area, and while many Lophorina superba are hunted, they seem to be plentiful enough to withstand the pressure.

1. Pidgin English: "I think the habitat of ka yambali (Narak = Paradisaea minor), is the same as the habitat of wild forest spirits".

The scarcity and solitary display habits of the Epimachus spp and Pteridophora generally means that the hunter is lucky to bag even one specimen. No one claimed to voluntrily limit the number of specimens killed of these species. It is with Paradisaea minor and Astrapia stephaniae that informants stated that they sometimes set limits on the number killed. Males of both of these species indulge in collective displays, and therefore when hunting at display trees the hunter has the opportunity to shoot several plume-bearing birds. Informants assert, however, that if all the adult males displaying at one tree are shot, it is likely that the tree will be abandoned. Immature males, they say, learn display behaviour from adult males, and interestingly enough, from adult females.[1] When all adult males cease visiting a display tree, or are killed, the females and immatures which visited the tree are then said to frequent other display trees. Many men claiming display trees will therefore ensure that at least one adult male is spared to remain as an attraction for females and immature males, thereby ensuring continuity of use of the tree as the immature males develop. Often it is the bikmaus[2] which is spared, since this individual, it is said, attracts other males to the display tree. Not all display tree claimants exercise this restraint, however. Some say their display trees are now abandoned because all adult males have been killed, others have shot all adult male birds, but immatures still apparently congregate at the trees.

Females and immatures of all valued plume-birds appear

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1. There is some doubt as to the accuracy of my recording of this piece of ethnoethology. Females where said to lukautim yangpela (look after the young) and lainim (schoolthem). The context of these statements suggests that the females are attributed to be teaching immature males the correct display behaviour.
2. Pidgin English indicating the leader of the displaying males or dominant bird; the individual which invariably is the first to arrive at the tree and the first to call. Its first calls are said to be to attract other males to the tree: yu kam, yu kam! (You come, gather here!)

to be killed and eaten on occasion. There is no particular effort made to secure these individuals, but they are taken as the opportunity presents itself. Since trapping allows the hunter no choice in the prey caught, numbers of female and immatures must be taken this way. A number of informants, however, remarked that females of plume-bearing birds are not shot because they karim pikinini (p.e. produce young) and lukautim pikinini (p.e. care for nestlings). Should too many females be killed, they say, there will be no further males to be hunted for plumes. This voluntary restraint is said to have been traditionally practiced. It is interesting to note that while females are deliberately spared for their procreative functions the reason given for restraint in hunting males is to ensure an attraction for more males to congregate at the tree, rather than emphasizing their reproductive functions.

Some informants stated that they do not shoot immature males, whilst others stated that voluntary restraints do not apply to the hunting of immatures. However, it seems that sub-adult males are not, for the most part, killed, since free-ranging juvenile birds are not distinguished from females, and therefore somewhat protected by restraint exercised in the hunting of females.

While the inclination of different individuals varies considerably as to following these restraints, and to what degree, these restraints undoubtedly are of benefit in reducing the number of plumed males and females killed, and hence in contributing to the maintenance of bird numbers at a level permitting continued exploitation of the birds.

6.5 Restrictions Imposed by Local Government Council

6.5.1 The Nature of Council Rules

None of the following Council rules to be discussed below have in fact been presented to the Office of Local

Government in Port Moresby. As such, in the formal sense of ratification by the central authority in Port Moresby, the rules are not effective, and compliance with the rules cannot be demanded. In practice, however, the great majority of people spoken to, both Council office holders and those represented by councillors, had definite views as to what constituted Council rules concerning hunting. The views of different individuals were often at variance with one another. Indeed, even Councillors' ideas of the rules differed, despite the fact that the Jimi Council had discussed the rules at its meetings. That much is clear, although examination of Council minutes of meetings, kept since September, 1968, indicate that little discussion appears to have occured concerning hunting and territorial restrictions. The Jimi Local Government Council was established in 1966. There is therefore a two year period for which records of meetings were not kept, and further gaps in the record after 1968. Moreover, each individual meeting is not fully recorded, as the Kwiop Councillor pointed out with some annoyance. It is quite likely, therefore, that the Council rules to be discussed here were discussed in Council meetings at some period for which records are not available. Another possibility suggested to me by Mr. Rod Cantley, A.P.O. (personal communication), is that Councillors laid down these rules after formal meetings were over. Mr. Cantley informs me that Councillors have established other "rules" in this way.

Because of the lack of records, it has not been established when these rules were decided upon. Statements of informants, both Councillors and non-Councillors are of little help. Some say the rules were established in the first year of the Council, some consider them to have been introduced about three years ago, while others place their introduction as late as early 1972.

In fact, the rules may never have had any prominence in Council debate at all. Like many traditional rights and

obligations, Council rules on hunting and territories may have had no more than perfunctory mention during meetings.

All informants stress that these rules follow traditional rights and restrictions (See sections 6.1 and 6.2 above). Just as individuals' conceptions of these traditional rights and restrictions vary somewhat, so do conceptions of council rules. Informants generally summarized the contents of the Council rules by stating that p.e. "nau Kaunsil i bihainim lo bilong tambuna" (The Jimi Council has followed the traditional rights and restrictions).

The application of these rules can best be demonstrated in examples of actual disputes (p.e. kots)[1] arising over infringements of hunting rights and territories to be given below (section 6.5.5).

6.5.2 Non-traditional Lo[2]

The majority of men questioned were aware that they were by law forbidden to shoot Paradisaea minor with a gun. In fact, while the law forbids the killing of all Paradisaeidae with a gun, informants specifically stated that only minor was so protected. This is presumably because they had been told in Pidgin English that they may not shoot kumul with shotguns. To the people of the Jimi kumul means only minor, as indeed seems to be the case with many Europeans. All other valued birds, I was told, could be shot with guns.

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1. I shall refer to the adjudication of disputes by Local Government Councillors as kots, adding the 's' to the Pidgin English in the interests of easier reading. Local kots are not recognized by the present legal system. Formal recognized courts of law, held before District Administration personnel, I refer to as "courts".
2. By the p.e. term lo is to be understood Council rules not ratified by the Office of Local Government. By law is meant the formal laws of Papua New Guinea.

Early in 1972 a Kwiop man was heavily fined for shooting minor with a shotgun (see section 6.5.5 for details). This man went hunting in the Ramu fall. Some informants stated that the birds shot had been poached from another clan cluster and that the hunter had been fined for infringing the territorial rights of another clan cluster. Others said the hunting occured on Kamam land, and considered that the fine was imposed for shooting minor with a shotgun.

It has been remarked that traditionally some men refrained from shooting females of plume bearing birds. All Councillors interviewed and many other men stated that there was a Council lo forbidding the hunting or trapping of female minor. Some individuals were apparently unaware of this lo, while other men stated that the shooting of females of Epimachus, Astrapia, Lophorina and Pteridophora was similarly forbidden. The Tsuwenkai Kaunsil was one of those reporting the lo against shooting females of these several species. He went on to point out, however, that this lo does not apply in Tsuwenkai, since under traditional practices Kundagais do not shoot the females of valued birds anyway.

One or two Councillors remarked that it was not easy to discover infringements of the lo on shooting female minor. As they pointed out, anyone might shoot the birds, throw away the skins and eat the flesh, with no one the wiser. It appears that no kot has yet been held over the breaking of this lo.

6.5.3 Reasons for Council Los

Council los concerning traditional territories are conceived as bestowing particular benefits upon territory holding groups as far as the exploitation of valued birds is concerned. The new Council los bestow what seem to be regarded as modern, legal validation to traditional rights. As one Kaureka man put it:[1]

1. The following is extracted from a rough translation of a long talk about the bisnis problems of Jimi people.

> All Jimis - from Mt. Wilhelm to Baiyer River - have little in the way of bisnis, and we mustn't lose our territories. We can earn money from the sale of plumes of ka yambali, ka mego, ka kisepa, ka tumba, ka miya, pigs and ka konggirari.[1]
>
> Our place is not good. We have coffee from the Government, but we get no money when we sell it at Tabibuga. At first the coffee bisnis was good; now we get very poor prices, or the Tabibuga people say "the buyer is not here" and we must return home with our unsold coffee.
>
> We have no bisnis. The Government wants us to plant coffee, but coffee prices aren't going up, and we worry. The sale of plumes is our most important bisnis. But we worry...

Other informants echoed this man's complaints about the lack of opportunity for engaging in bisnis. Several pointed out that territorial rights, safeguarded by Council lo, work to the bisnis advantage of the individuals of those groups claiming territories. Such a lo protects the territory holders from the exploitation of their valuable bird populations from the depredations of hunters who have no rights to the land.

It is possible that the lo requiring the hunter of valuable birds to confine his efforts to within the territory of the smallest territory holding group to which he belongs has some conservatory value. Groups with a low man to land ratio will tend to impose a lesser pressure upon bird populations than groups with a higher man to land ratio. While groups with a higher population pressure may hunt valued birds to the extent that the survival of the birds is jeopodized, there will remain areas of

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1. Paradisaea minor, Astrapia, Pteridophora, Epimachus, cassowary...and Lophorina.

comparative refuge where the bird populations can withstand the hunting pressure. Thus, while the lo may ultimately work to the disadvantage of groups with a large population in relation to accessible hunting land, groups with a lower population density to available hunting land are in an advantageous position in regard to the opportunity to exploit birds for bisnis purposes.

Los forbidding the use of firearms, and the shooting of female plume bearing birds are recognized by the people as having conservatory value. Several informants told me that when Councillors announced the introduction of these los, Councillors stressed that the los were designed to reduce the rate of exploitation, and preserve females for breeding purposes so that bird populations would be maintained at a level permitting continued exploitation.

6.5.4 Scales of Compensation and Fines

It has been pointed out for a number of New Guinea societies that "offences" are generally conceived of as damage towards individuals (e.g. M. Strathern 1971:8 for the Melpa). Furthermore, restitution may be secured by the payment of compensation to the wronged party. Of the los discussed above, the only ones which, when broken, are not "crimes against persons" are the low forbidding the shooting of minor with shotguns, and the lo forbidding the shooting of female minor. Infringement of the first law is dealt with by the Kiap's court (when, and if, detected). Infringement of the second lo is dealt with in the local kot. Even in this case, however, fines imposed are not paid to the central authority responsible for the upkeep of the lo; that is, the Jimi Council. Such fines are said to go to the Kaunsil. The fine is said to be $1 for shooting the forbidden bird and $2 for breaking the lo. In fact, these statements are hypothetical, as it seems no one has in fact been taken to kot over this lo.

Compensations ruled as appropriate for the poaching of birds to which other individuals or groups have sole

rights of access vary somewhat. In general, Councillors seem to settle such disputes by either demanding the return of the birds shot, or the payment of the current market value of the birds (see section 7.3.1 for monetary value). In addition, a further payment may be ruled for infringing upon the rights of others. Where a bird has been shot at a display tree claimed by an individual, compensation is paid to the tree claimant. Where it is group territorial rights that have been infringed upon, compensation is said to be paid to the Komiti who represents the interests of those whose rights have been infringed upon.

Few kots seem to have been heard over the infringements of hunting rights. Reconstructions of several kots are given below which illustrate some of the ways in which compensation is paid.

It was sometimes stated that where the poacher had been to a lot of time and effort to obtain a bird he was often allowed to keep the spoils. The idea behind this seems to be that such hard work should not go unrewarded.

Several Councillors, even some who have held office since the Jimi Council was established in 1966, have not adjudicated disputes arising from the infringement of hunting rights. As some say, p.e. "ol i harim lo, na ol i pret. Ol i bihainim lo bilong Kaunsil" (everyone has heard the law and is afraid to break it. Everyone has followed the Council laws). Disputes seem to arise most frequently over Paradisaea minor.

Those Councillors who have not themselves adjudicated such disputes cite the settlements agreed upon in kots adjudicated by other Councillors, either their predecessors or Councillors of other Wards. They state that should they be called upon to adjudicate disputes they would take the settlements arrived at by previous kots as their precedents for the amount of compensation to be paid to the wronged party.

6.5.5 Record of Kots

Several kot cases are reported here which illustrate points brought out in previous sections. Dr. E.A. Cook (personal communication) states that kots are often protracted affairs, in which all manner of apparently irrelevant evidence and grievances are expressed. He also notes that kots appear to have a very real entertainment value for those not directly involved in the dispute. This being the case, the following reconstructions of kot cases as dictated by informants can only be taken as brief summaries of the proceedings. They cannot even be taken as statements of the main issues brought out at the kot.

To the best of my knowledge, no kot cases concerning hunting of valued birds were held while I was in the Jimi.

The first case to be discussed is that of a Kwiop man charged with shooting Paradisaea minor with a shotgun. This case came before the kiap in Tubibuga. This case is reconstructed from several informants' accounts. I do not have the official account of the case, but there is enough correspondence between the different accounts I obtained to suggest that the reconstruction is correct in its essentials.

1. In about mid-1971 a man of Kwiop borrowed the Kwiop Kaunsil's shotgun, and at the request of several Bubgile men went to hunt Paradisaea minor in their company in the Ramu fall. In all, about 30 minor were shot. Some of this hunting took place close to the territory of a Simbai group. The Simbai people claimed that some of those birds shot had crossed the boundary between their land and the Kamam of Bubgile, and that therefore those birds shot rightfully belonged to the Simbai group. They complained to the Simbai kiap, evidently mentioning the use of the gun by the Kwiop man. The Simbai kiap is then said to have written to the Tabiguga kiap informing him of this illegal activity in his area of jurisdiction. Consequently the Tabibuga kiap investigated the case, gaoled several Kamam men for initiating the hunt, and confiscated the shotgun for

three months. The shotgun user avoided going to gaol by the payment of a $200 fine, paid by the Kwiop Kaunsil and a Tubibuga man with business ties with the Kwiop Kaunsil.

This case had been held early in 1972. The heavy fine imposed does not appear to have detered at least one man known to me from continuing to hunt minor with a gun.

2. Komiti Tabinde v. Welek.

Komiti Tibinde of Kulaka-Enggeka clan and Welek of Temba-Maruwaka clan of the Manga clan cluster both claimed a display tree each of P. minor. One of the males of Welek's tree began visiting Tabinde's tree. Welek made a hide in Tabinde's tree and shot the bird he claimed as his. On discovering this, Tabinde confronted Welek and argued that the bird shot was his (Tabinde's) since it had been at his tree. Welek disputed this, and the two men fell to blows. Eventually they took their dispute to Kaunsil Mai. Mai, however, could not get the disputants to agree to a settlement, and so escorted them to Tabibuga to have the kiap settle the affair. According to Mai, the kiap had said that if a bird leaves one display tree and flies to another it can be shot only by the man who claims that tree in which the bird displays at any one time. In other words, that since the bird had left Welek's tree for Tabinde's, it was Tabinde who had the right to shoot it. No compensation seems to have been paid in this case.

Later, in rechecking this account with Mai, he revised his earlier statements. The kiap had in fact refused to settle the dispute, stating that such trivial disputes caused too much work. The kiap directed a policeman to settle the dispute.

Mai, however, cites this settlement as being given by the kiap, and states that he regards the ruling as a precedent in settling any further disputes. It is also to be noted that the policeman's ruling conforms to the

traditional scheme of individual rights to birds.

3. A man of Ageleka shot a minor at a display tree claimed by a Darleka man. Both clans are of the Kamam cluster of Bubgile. The resulting dispute over ownership of the bird was taken to a kot adjudicated by a former Bubgile Kaunsil. Kaunsil ordered the Ageleka man to return the bird skin as settlement of the dispute. The Ageleka refused, whereupon the Kaunsil threatened to take the kot to the kiap. This frightened the Ageleka into complying with the Kaunsil's ruling.

4. About six years ago a Kamam man shot an Astrapia at a display tree claimed by a fellow clansman. The wronged man took the offender to kot, where the Kaunsil ruled a compensation of $4. The poacher was permitted to keep the plumes since hunting Astrapia is hard work. Compensation was low in this case since both parties to the dispute were of the same clan.

The present Bubgile Kaunsil states that should he be called upon to adjudicate disputes he would follow the precedents established in cases 3 and 4 when ruling the amount of compensation due.

6.5.6 The Power of the Kiap

The above cases show that the kiap may be appealed to as the ultimate authority when parties to a dispute do not agree to the terms of a settlement. Case 2 shows that the kiap himself does not in fact choose to enter into such disputes. The present kiaps informed me that they would refuse to adjudicate such disputes since the disputes arise over traditional rights and restrictions and are therefore best settled by Councillors who have a better understanding of traditional rights than do European administrators.

Nonetheless, Councillors often cite kiaps as supporting los relating to hunting. In fact, informants in Tsuwenkai and Bokapai initially led me to believe that territorial hunting rights had been instigated on the advice of the kiap.

Evidently what had happened was that the Councillors of these wards had claimed the kiaps to have suggested these los so that people would be more inclined to comply with them.

The kiap, then, is often invoked by Councillors as the ultimate sanction for Jimi Council los. The majority of people have little contact with kiaps, and on occasions when they do take their disputes to the kiap they may be told not to bother the kiap but seek adjudication of their dispute by Councillors. Such a directive only serves to strengthen Councillors' claims that the kiap endorses the legal powers of Councillors. As case 3 above shows, men do fear the kiap's court, even though, as Dr. E.A. Cook (personal communication) has pointed out, they may not fear the Administration gaol.

Furthermore, by claiming (and in practice receiving) endorsement of Council los and the Kaunsil kot by the Administration, Councillors and their supporters have created a situation in the Jimi not unlike that reported by Marylin Strathern (1971:7) for the Mt. Hagen area. Hageners, she writes "regard their modifications of traditional methods as contributing to the development of a modern, progressive society, and as stemming from the lo which Europeans have introduced. They recognize differences of custom (between themselves and Europeans), but far from seeing their unofficial courts as distinct from the official court hierarchy, treat them as part of it".

PART 4

7. USES OF PLUMES

7.1 Decorations

Bird plumes and animal pelts are primarily utilized as items of personal adornment. The distribution of different bird species utilized as decorations has been discussed in Section 4. Not all local populations have access to all species utilized. A number of plumes are therefore obtained other than by hunting. The means of acquisition of plumes is discussed in section 9. While plumes figure significantly in the exchange economy of valuable cultural items, they are exchanged primarily because of the desire to possess fine decorations. As Rappaport (1968:106) remarks, to the Tsembaga Maring and their neighbours, "all of whom are without sculpture, ornamentation of the self or of shields is a form of artistic expression. They consider fine plumes and shells...to be among the most beautiful of objects, and men enjoy possessing them for their own sakes".

I have no good data on occasions for which plume decorations are considered appropriate. Certainly, Maring, Narak and Kandawo seem to place less emphasis on personal adornment than do the Melpa (cf. Strathern, 1971). On informal occasions such as visits to kin or for courting parties, Melpa men cover their hair with a wig decorated with strips of marsupial fur, leaves, and perhaps a few feathers. Decorations employed for courting parties may be rather more lavish (Strathern, 1971:36ff. and pl. 22, Col. pl. 27). On comparable occasions in the study area, men generally smartened themselves by donning a clean set of shirt and short trousers. Broad strips of cuscus fur rather like a tall cap are sometimes worn on the head. For courting parties, men and youths may wear a few forest flowers in their hair, and generally paint their faces with red trade paint. On occasions where a neat appearance is expected the tendency is to adopt European clothes. This

seems to be the reverse of the situation near Mt. Hagen among at least the Melpa and Kyaka Enga where traditional dress and decorations are favoured.

It has not been determined whether the occurence of occasions for which decorations are considered appropriate have increased or decreased. Of the three missions operating in the study area, Anglican, Nazarene, and Catholic, the Anglican mission at any rate, has not discouraged festivities. On the contrary, it seems to have favoured singsings to mark religious and secular occasions. Thus, singsings are performed at Christmas, the consecration of churches and baptisms, and for instance, the opening of new schools.

7.1.1 Decoration Styles, Past and Present

According to informants, decoration styles have changed somewhat over the period of contact. Both the arrangement of plumes and the plumes most commonly used have changed. In part this change stems from changing tastes as to which plumes are considered most desirable, and in part to the increasing availability, not only of different types of plumes, but their quantity.

Few decorations were observed. Informal decorations were observed in Tabibuga on the occasion of a visit from the Papua New Guinea Chief Minister, and at Kwiop worn by visitors, and at a meeting called by the Kwiop Kaunsil to report on a Council meeting held at Tabibuga. Several men and girls were observed at Kwima on their way to a bride price payment, while several Kwiop men decorated themselves at my request.

Informal decorations observed mostly consisted of parrot wings, complete parrot skins, and occasionally an old Paradisaea minor flank plume thrust into a skull cap. Cuscus fur or a band of red calico was often bound round the forehead. Cassowary pompoms were sometimes worn, often with an owl wing (Tyto alba) or the tail of the possum

Dactylopsila trivirgata planted amidst the plumes.

At the Kwima bride price payment it was the girls who were most lavishly decorated. Of those decorated, most had bands of cuscus fur about their foreheads, with skins of Charmosyna papou and Tanysiptera galatea standing up within a fringe of Psittrichas fulgidus feathers. Several also had Paradisaea minor plumes standing out horizontally above their ears. Of the men accompanying the procession carrying the bride price, most were undecorated but for a forehead band of red calico or cuscus fur. A few, however, were wearing cassowary topknots. One man had planted a Paradisaea raggiana plume on either side of his cassowary plumes.

The ideal decoration set now considered appropriate for major festivities consists of a fringing halo of, generally Psittrichas feathers, surmounted by Paradisaea minor, Astrapia, or Epimachus plumes. A mixture of these three plumes may be worn, although a predominance of Astrapia plumes is favoured. Parrot and other skins may be planted amidst the more prominent plumes. The overall effect is similar to that figured in plates of the Kuma of the Wahgi Valley by Reay (1969b). This style contrasts somewhat with the arrangement of decorations figured in plates for the Maring by Rappaport (1967). Here, plumes (mostly of eagle) are arranged on a basketwork base to form a broad spreading headdress. Paradisaea minor mounted on a long flexible stick, may form the centrepiece of such an arrangement. It seems that a similar style formerly was employed by Narak, as well as the Karam, to the west of the Maring. Among the Narak, this style has been largely superceded by styles adopted from Kuma speaking peoples of the Wahgi and south wall of the Jimi. The same influence seems to be operating among the Maring too. I found no evidence of the influence of Melpa styles in changing decoration fashions.

Prior to contact the tail feathers of the Buzzard Henicopernis longicauda, the Eagle Harpyopsis novaequineae,

and the Hornbill Aceros plicatus seem to have been the most favoured of plumes, in conjunction with Paradisaea minor, P. raggiana, Epimachus, and Astrapia plumes. Feathers of these raptores, the Hornbill, and P. raggiana are largely scorned now. They are referred to somewhat disparagingly as "old men's plumes".

In Table 8 are listed those species and body parts employed and the manner in which these are worn in decorations.

Table 8

Parts of Bird Species Utilized, and Manner Worn in Decorations

Legend:
- B : Body feathers
- O : Occipital plumes
- P : Ornamental plumes
- S : Whole skin (Usually minus wings, legs and feet and sometimes tail)
- SP : Part skin (Usually more brightly coloured parts of dorsal or ventral surface)
- T : Tail feathers
- W : Wings (Fanned)
- WF : Wing feathers
- * : Indicates plumes of lesser importance, usually thrust into headdress where room available; e.g. back or sides.

Species	Parts Used	Manner Worn
Casuarius spp	B	Topknot
Henicopernis longicouda	T	Headdress mounted on basketry base
Harpyopsis novaeguineae	T	Ditto
Sterna sp.	W	*
Ptilinopus superbus	W	*
Ptilinopus rivoli	W	*
Goura sp	P	* Crest
Pseudeos fuscata	W	*
	SP	Threaded on string as headband
Trichoglossus haematodus	W	*
	SP	Threaded on string as headband
Domicella hypoinochrous	W	*
	S, SP	Threaded on string as headband or breast-piece

Charmosyna papou	S, T	*
Charmosyna pulchella	S	*
	T	* and threaded on string as headband
Neopsittacus muschenbroekii	W, T	*
Cacatua galerita	T	Headdress, with or without basketry base
	P	* Crest feathers
Psittrichas fulgidus	B	Attached to basketry ring and worn as halo on crown at base of centrepeice. Several downy feathers bound on small sticks worn as a fringe around skull cap.
	WF	As halo, above. B and WF also mounted on shield-shaped plaque on backing of bamboo bark or cardboard, worn as centrepiece.
Larius roratus	T	On string as forehead band
Tyto alba	W	*
Collocalia hirundinacea	W	Both wings spread, worn on forehead. Recorded once - wings tinted with red paint.
Tanysiptera galatea	S	*
	T	* or worn through pierced nasal septum, or in beard
	W	* May be tinted on underside with red paint
Aceros plicatus	T	Headdress, with or without basketry base. Upper mandible (sometimes engraved) also worn as ornament between scapulars.
Pitta erythrogaster	SP	Ventral surface. Threaded on string as forehead band or neck ornament.
Artamus maximus	W	*
Manucodia ?chalybatus	S	as base for Astrapia tail
Epimachus fastosus	S	With fans spread, as centrepiece
Epimachus meyeri	S	Ditto
	T	As centrepiece
Astrapia stephaniae	S	As centrepiece. Central tail feathers mounted in skin
Parotia carolae	O	* and in nasal septum
	SP	Ornamental flank plumes + O
	S, SP	On forehead
?Parotia lawesi	S, SP	Probably ditto

Lophorina superba	P	Cape and breast shield fanned, worn on forehead, or over ears.
	S	One record. Ornamental plumes unfanned, as base for Astrapia tail.
Diphyllodes magnificus	SP	Mounted on string as forehead band. Cape and breast shield fanned and worn on forehead or over ears.
	T	In nasal septum, beard, or in headdress.
Cincinnurus regius	S	One record: as base for Astrapia tail. T also probably used as with Diphyllodes.
Paradisaea raggiana	S	As centrepiece
Paradisaea minor	S	Ditto or projecting horizontally from sides of headdress
Paradisaea rudolphi	S	As centrepiece
Pteridophora alberti	S O	* (occipitals may be detached and remounted in 'tail' of skin).
	O	* and in nasal septum
Amblyornis macgregoriae	P	* Crest
Domestic fowl	B	* and mounted on string as forehead band

7.1.2 Some Social Implications of Decorations

It has already been noted that certain plumes are considered suitable only for old men. Younger men no longer desire to possess these plumes, possession of which is, to some degree, a mark of the aged and the unimportant. The aged, on the whole, do not command respect merely because of their age; some in fact, are openly ridiculed. Few men over about 50[1] possess plumes, since few take an active part in entertainments accompanying ceremonials. This, then, is the first implication of decorations: that their wearers are, or consider themselves to be, among the more vigorous members of society.

It is my impression that of those men whose plume collections were censused, those who possessed the largest, most varied, and better preserved collections, were

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1. This estimate of age is open to question. Some men of whom I speak here may, in fact, be many years younger.

generally accorded more respect by their fellows than other men. This applied not only to men prominent in traditional economic and political spheres, and to those who had been prominent as fight leaders in the past, but also to a number of men prominent in the introduced political arena of Local Government. Most of these men (Councillors and Committees, and aspirants to these offices) are younger men who have been away as indentured labourers and have returned with a strong motivation to earn money. The above contrast between traditional and changing political activities is not intended to suggest that there is conflict between the old and the new, the aged and the young. My data is insufficient to embark on such a discussion. It is of note, however, that in a paper on the traditional "big man" in Maring society, Lowman-Vayda (1971:355ff) briefly discusses the effects of Western contact upon the "big man" complex. She notes that the authority of older men in family matters, but most particularly in political spheres, is being challenged by younger men. Generally the younger men are gaining ascendency, although not occupying specific political offices. Lowman-Vayda's research was conducted within the first year of the Jimi Local Government Council. Since that time, younger politically active men have gained specific political offices, but in the new sphere of Local Government rather than in traditional spheres.

A number of young men expressed disinterest in possessing plumes. "Money is what we want" they would say. Others, equally desirous of money also possessed plumes and had engaged in limited trade in plumes. There is still obvious enjoyment to be gained by younger men by participating in traditional festivities, and for this purpose plumes are desired.

From observation of men showing me their plumes, their apparent status in the community, and the casual remarks of spectators to my censusing, as well as at other times, it seems reasonable to make the following inferences about

the possession of plumes. Since plumes are valuable items employed in the prestige exchange economy, possession is some indication of a man's wealth and competence in the exchange economy. It indicates the discharge of kinship obligations and a man's activity in trade, since plumes may be acquired by gift from kinsmen, by meeting trade obligations with formal trade partners, or in trade with unrelated persons (see section 9). Possession of plumes of birds shot by their owner also indicates that their owner is a man possessing vigour and skill. All these attributes, wealth, strength, skill, and a commitment to meet obligations of mutual support obtaining between kinsmen, are characteristics of the "complete" or "worthy" man. Possession of a rich and varied plume collection, evident when the individual is decorated for some festive occasion, serves to indicate that to some degree a man has attained those characteristics taken to be the attributes of the important man.

The Strathern (1971:124) have noted that ceremonial exchanges and the massed dancing of decorated males among the Melpa "are now the only medium in which group rivalry can be fully expressed". Both individuals and groups strive for the commendations of spectators in the splendour of their display. The marked competitiveness of Melpa society does not appear to be so pervasive an element in the culture of the people of the study area. My own enquiries into the social implications of decorations and displays are by no means as complete as they could be. Informants did not remark upon any element of overt competition between individuals or groups in decorations and displays. This is not to say that such competition and rivalry plays no part in festivities. What informants did stress, however, was the power of splendid decorations and strong dancing to attract women. As one Kyiop man who owns a relatively impressive plume collection said somewhat airily to me, "ol meri plai plai long mi.

Ol i laik pasim han bilong mi. Ol i krai long m na tok, 'Sori! Mon em i man bilong mi". (p.e. The girls flock to me. They all grab hold of my wrists. They long for me, and say, 'Ah! Mon is the man for me!)

The plumes said to arouse the amorous desires of women the most are of Psittrichas fulgidus. Although seldom forming the centrepiece of headdress styles, this seems to be considered an essential plume to the overall effect of decorations among the Narak and Kandawo, and, although perhaps to a lesser extent, among the Maring.

Rappaport (1968:193ff.) has examined this aspect of dancing displays among the Maring in connection with kaiko festivities. The collection of dancing males, he holds, "presents to the female spectators larger samples of the males of unfamiliar local groups than they are likely to see assembled at any other time or place. The males, furthermore, signal by their participation in the dance their general interest in the females as a class". However, "the amatory display of the males does more than present a sample to the females. It also provides them with a basis for differentiating among males. The appearance of the individual men - their dancing and the richness of their adornment - indicates to females their strength or endurance and their wealth or the wealth of their connections". It has been argued above that it is these attributes that are expected of a man. Moreover, as Rappaport (1968:194) points out, it is not only females who make these assessments of the dancers, but also the women's male agnates who have considerable control over the choosing of a woman's husband. While Rappaport writes only of kaiko entertainments in his discussion of the implications of display on sexual pairing, it is evident that other festive occasions serve the same function also.

It is possible that such display behaviour as discussed above is of rather more importance to sexual pairing (which may or may not lead to marriage), among the Maring than among

the Narak and Kandawo. For among these last two peoples the p.e. karim lek courting parties of the Wahgi Valley are practiced. Some Maring men and youths of settlements bordering on the Narak area also participate in karim lek parties. Karim lek does not appear to be practiced in Maring settlements at all, however, and few if any Maring females attend the parties. There are therefore more opportunities available for amorous overtures for the Narak and Kandawo than there are for the Maring.

7.2. Plumes as Wealth Items

Wealth items or valuables are called munggoi (Narak, Maring, and Kandawo). Rappaport (1968:103) lists this class of objects as including shells, feathers, animal skins, steel tools, pigments, and previously, "bridal" axes. To this list has been added money, cloth, and trade beads. My own data, although incomplete, indicates much the same, although cloth and trade beads and pigments do not appear to be much prized as wealth items in the Jimi any longer. Most bird plumes that are traded appear to be members of the munggoi class, as are furs of Phalanger maculatus, P. atrimaculatus, and Dendrolagus goodfellowi. Shell items have been tentatively identified by comparison of vernacular terms collected with those listed in Hughes (1971:fol.317). These are cowries (Cypraea sp.) tambu or dogwelk (Nassa sp.), kina or pearlshell (Pinctada maxima), bailer shell (Melo sp.) green snail shell (Turbo marmoratus), and cone shell (Conus sp.). Rappaport has not included pigs or cassowaries as munggoi although at least one young man claimed that these were in the category. Rappaport (1968:56) notes the use of dog and marsupial teeth as valuables prior to the introduction of shells into the Simbai. Tooth ornaments do not appear to be in the munggoi class in the Jimi nowadays.

All these valued items can be, and are exchanged for one another. They figure prominently in exchanges and gifts between kin, as well as between trade partners and itinerant traders.

As wealth items, plumes figure prominently in bride price payments among the Narak and Kandawo. The quantity of plumes transferred, however, does not appear to be as great as that reported for the central Chimbu, for instance, (Brown, 1970:109). Species most commonly included in bride price are Psittrichas, Astrapia and Paradisaea minor. I have no satisfactory data on the numbers of different species employed in bride prices, partly because the recipients of the bride price redistribute valuables received to those to whom they have obligations making it difficult to list an inventory of items transferred. Astrapia plumes may number ten or more; (I have one record of 12 being transferred, and numbers may exceed this on occasions). At least five Paradisaea minor plumes may be included in a bride price. Further transfers of plumes occur in connection with marriage. When a bride goes to join her husband she is often heavily decorated with shells and plumes, over which her husband and his agnates have rights of disposal.

Plumes seldom figure in Maring bride price except where wives are drawn from neighbouring Narak communities. Plumes are used occasionally in bride price within the easternmost Maring group in the Jimi, the Yomban clan cluster.

Meggitt (1971:199) has noted for the Mae Enga that valuables "distributed and exchanged in Mae prestations do not comprise a single homogenous field within which there is free convertability". Valuables are hierarchically arranged into four categories, and valuables of one class can be exchanged only for valuables within those classes immediately above or below in the hierarchy. Valuables, at least among the Maring, do not appear to have been so

rigidly categorized according to differential values. Valuables are freely convertable one with another, and, unlike the Mae Enga situation, could be exchanged for utilitarian articles. Thus, for instance, wealth items, including plumes, could be exchanged for the utilitarian articles, stone work axes and salt from mineral springs. Rappaport (1968:106ff.) contends that the convertability of non-utilitarian into utilitarian articles "stimulated the production and facilitated the distribution of the utilitarian goods". He notes that where the consumers of utilitarian articles (salt and stone work axes in his argument) are spatially and socially at a distance in chainlike exchange systems, moral pressure is weakened by the distance and the intervening links in the exchange system and cannot be relied upon by consumers to ensure production of those items they require. If, he continues, utilitarian items can be obtained only in exchange for other utilitarian items, then insufficiency of supply might develop, since the production of one item is determined not by its demand in other areas, but by the demand of those who produce it for those other utilitarian items produced elsewhere. Thus, for instance, the production of Jimi axes was governed not by the demand of Simbai people for axes, but by the demand of the Jimi axe makers for Simbai produced salt. Rappaport argues that Jimi axe production would cease when the axe makers had sufficient salt. Hence, Simbai salt producers might not be able to satisfy their demands for work axes. But since wealth items may be exchanged for utilitarian axes and salt, production of these utilitarian items could be maintained. Wealth items are in constant demand, especially bird plumes which are perishable. Thus, if Simbai salt was, for the time being, unacceptable to Jimi axe makers, the demand for axes in the Simbai could be satisfied by the exchange of wealth items for axes.

Hughes (1971:363ff.) questions Rappaport's hypothesis. To begin with, Hughes remarks that Rappaport has regarded the trading transactions outlined above as a closed system. He points out that the system cannot be regarded as closed, that transactions for salt and work axes did not flow solely within the confines of the Tsenga-Ganz River area in the Jimi and the Simbai. Secondly, Hughes considers that Rappaport has underestimated the importance of intermediate links in the trade chain. "Each node in the manystranded web that stretched between the Simbai and Tsenga-Ganz River areas had a different set of demands and a different set of goods to offer, all affected by their location in reference to east-west as well as north-south flows of goods, and by past, present and planned trading and ceremonial activity...A host of minor ornaments and utilitarian goods were exchanged in a multiplicity of directions, mediating between transfers of larger items and often masking for a time the dominant directions of flow" (Hughes, 1971:365).

On the basis of his own data Hughes considers that the transfer of utilitarian goods might still have been effected without the injection of wealth items into the trade system. He concludes, however (1971:366), that "valuables stimulated the production of utilitarian goods, increased the quantities and rates of flow through the network and assisted their transfer by acting as supplementary and better media of exchange, better because their relative values changed less spatially and temporally than those of specialized utilitarian goods".

Professor Ralph Bulmer (personal communication), has pointed out that it is not always easy to distinguish between utilitarian and non-utilitarian and valuable and non-valuable items. Thus, for instance, while Simbai salt was no doubt of nutritional utility, it appears to have been a highly valued item, used infrequently, mainly on ritual occasions (cf. Rappaport, 1968:135ff.) Articles

in the munggoi category are not of any direct material use, and since salt was not of the munggoi class one might argue that it was a utilitarian rather than non-utilitarian article. On the other than, most local groups did have access to salt made from the leaves of a small forest epyphitic plant. Yet Simbai salt still enjoyed a large trade area. In large part, this is probably because it was considered to be of superior taste. In part, however, Simbai salt may have been sought by groups with no access to the salt springs because this salt was an important element in feasts on ritual occasions. On the other hand, the fact that this salt has now been entirely replaced by "European" trade salt may be an indication of its status as a utilitarian item. Most non-utilitarian items are still circulated in the trade systems of the area.

However, this ambiguity between utilitarian-non-utilitarian and valuable - non-valuable need not nullify Rappaport's hypothesis. The essential point of his argument seems to be not so much these dichotomies, as the injection of extra items into the trade system so as to ensure the continued supply of desired goods.

7.2.1 Storage of Plumes

Like other wealth items, plumes are carefully packed away when not in use to prevent rapid deterioration and decay. Unlike more durable objects such as shells, plumes and animal pelts are subject to discolouration, attack from insects and fungus, and are liable to become brittle and easily broken or damaged.

Tail feathers of the Astrapia are usually stored four or five together in a section of bamboo. The end is plugged with leaves, or more commonly nowadays, with empty fish tins. The Astrapia body skins which usually

form a base for the tail feathers when worn in decorations, are usually kept separately in packages containing other plumes.

Paradisaea minor plumes are prepared in one of two ways. The skin and flank plumes are spread out and clamped flat till, after smoke and sun curing and drying they remain in position, or the skin is stuffed with vegetable fibre, the body and flank plumes conforming more or less to the natural form of the bird. Stuffed skins are kept in bamboo tubes, while the flattened skins may be kept in flat bark packages along with other plumes.

Epimachus skins are generally kept in separate bark packages. For fastosus these may measure up to 1.7 m in length. Skins of these birds seem to increase somewhat in length in the process of being flattened.

Other plumes are generally kept together in flat bark packages. The packages are made from the bark encasing the axils of a tall, unidentified, forest palm. Plumes are interspersed with broad, thin leaves to prevent entaglements. Paper is often used as a substitute now. One man had brought back cocoa leaves for this purpose from the Gazelle Penisular on his return from indentured labour. Packages are kept rigid by inserting them between cleft sticks. Only a few packages seen were made of Pandanus leaves, the usual material for plume packages in the Kaironk Valley (Professor Ralph Bulmer, personal communication).

Plume packages and bamboo tubes are stored out of harm's way in the walls and rafters of houses, where the dry, smoke-laden air is some protection against attack by insects and fungus. In fact, no storage methods are entirely proof against insects, and some plumes observed had been severely damaged by insects.

Nowadays many men have suitcases or wooden strongboxes, often fastened with a padlock. Plumes are locked away in these containers, along with finely woven aprons decorated

with marsupial fur or coloured wool, skull caps, fur bands, valuable shells, trade beads, bottles of perfume, and sometimes mementoes of their days spent as indentured labourers, such as photographs of themselves and workmates, mandibles of turtles, and, in one case a capacious white brassier.

It is not easy to assess the age of most plumes. Some Paradisaea minor and Astrapia plumes seem to have been retained by their present owners for as much as 10 years. Most of such Astrapia plumes are still in excellent condition, although minor plumes of this age tend to be very faded and discoloured. One man who owns a Paradisaea raggiana skin, obtained it about 15 years ago when he was a boy. He retains this in fairly good condition for sentimental reasons, but says he no longer uses it in decorations.

Astrapia and Epimachus plumes seem to last the longest of all plumes, partly because they are highly valued and therefore preserved more carefully, and partly because, being black, they fade and discolour less noticeably. Some Astrapia plumes seen may have been up to 20 years old.

7.3 Plumes and the Monetary Economy

Some notes will here be given on the cash value of plumes and comparisons of cash income from the sale of plumes with other forms of income. The sale of plumes for cash will be examined further in section 10.

7.3.1 Monetary Value of Plumes

Cash values for different plumes are fairly constant throughout the study area, although prices received vary somewhat from informants' statements of value, primarily in relation to the quality of plumes being sold. Plumes are seldom sold to kin, and on such occasions it seems that prices may be somewhat lower. Prices asked and received from friends also seem to be lower. Data is insufficient

on such transactions to permit an assertive statement however.

Actual cash average values listed below have been calculated from the stated cost of plumes in the census sample, plus stated prices paid or received in specific transactions engaged in the past which some informants were asked to enumerate.

Table 9
Average Monetary Value of Plumes

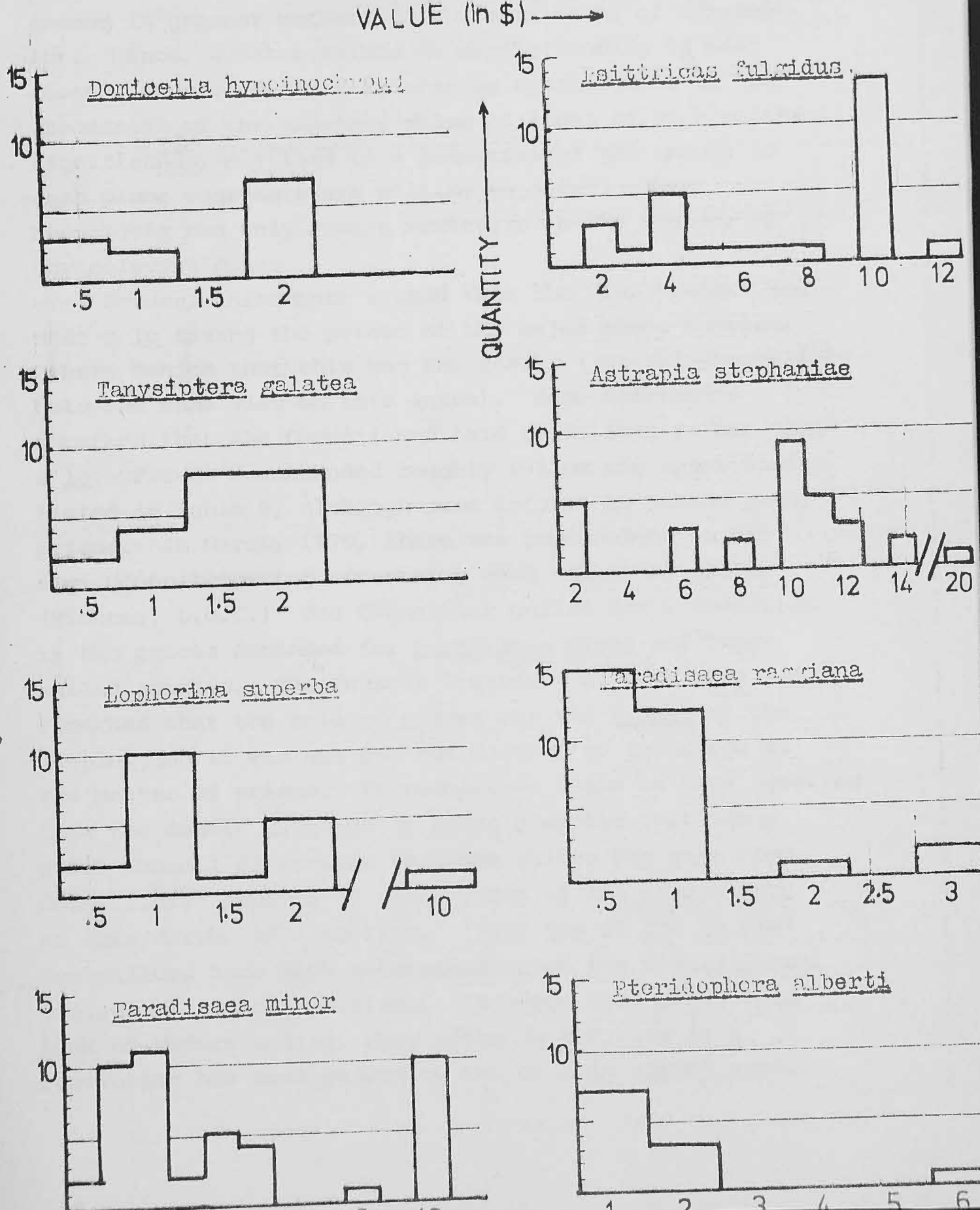
Species	Average	Number	Price Range $
Domicella hypoinochrous	1.50	12	50¢ - 2
Charmosyna papou	2	92	50¢ - 4
Cacatua galerita*	2.10	4	50¢ - 4
Psittrichas fulgidus*	7.26	27	3 - 12
Tanysiptera galatea	1.55	22	1 - 2
Epimachus fastosus	30	3	25 - 40
Epimachus meyeri	3	2	2 - 4
Astrapia stephaniae	9.20	31	2 - 20
Lophorina superba	1.68	20	50¢ - 10
Paradisaea raggiana	.85	30	35¢ - 3
Paradisaea minor	4.20	44	50¢ - 10
Pteridophora alberti**	1.73	11	1 - 6

* Values and numbers refer to quantity of feathers generally used to make one headdress or halo. Sales of smaller quantities of Psittrichas feathers have not been included.
** For two occipital plumes.

These average prices may be somewhat misleading. The distribution of recorded prices are indicated in Figure 4 where the number of plumes sold is sufficient to warrant a graphic plotting.

When informants are asked to list the current market cash value of various plumes they generally give figures roughly corresponding to the highest values listed in Table 9. Some informants also list minimum prices. According to some informants, the cash value of plumes has dropped in recent years. Thus, for instance, one man asserts that previously Epimachus fastosus could be sold for $100 while it can be sold for no more than $40 now. $100 is undoubtedly an exageration. The reasons for this apparent decrease in the price that can be expected is unclear. It is

Figure 4: Monetry Value of Plumes



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possible that with increasing freedom of movement due to road construction within and beyond the Jimi, and an increased confidence of individuals to travel further abroad without fear of being molested, plumes are being traded in greater numbers to the main areas of consumption. Hence, greater volume of supply tending to meet demand, coupled with an increasing appreciation of the assessment of the monetary value of items of high cultural significance, may lead to a reduction of the amount of cash plume consumers are willing to offer. This hypothesis can only remain tentative in the absence of any relevant data.

Several informants stated that the Jimi Council had made a lo fixing the prices of the major plume species. Others denied that this was the case. (Not all Councillors held the same view on this issue). Some informants remarked that the Council had laid guidelines rather than a lo. Prices recommended roughly follow the upper limits listed in Table 9, although some informants stated higher prices. In March, 1970, there was some debate in the Jimi Council meeting concerning cash values of plumes (Minutes, L.G.C.) One Councillor called for a reduction in the prices demanded for Paradisaea minor and long-tailed species. The Council President at that time remarked that the sale of plumes was the bisnis of the people, and it was not for the Council to intervene in the matter of prices. No resolution seems to have resulted from the debate although it seems possible that ideas about Council directives on plume values may stem from Councillors' reports to their Wards of the proceedings at this March, 1970 meeting. Very few of the 50 Jimi Councillors have much understanding of the highly formal conduct of Council meetings. It seems that given this lack of understanding, they often do not know if a resolution has been passed or not or a lo agreed upon.

Of those who considered that there was a lo setting price limits on plumes, the great majority stated that these limits were not in fact binding. Only very few people stated that a man could be koted for selling plumes above or below the Council-fixed rates. Such action does not appear to have been taken.

7.3.2 Importance of Plumes in the Cash Economy

It has not been possible to estimate the average yearly income from sale of plumes. Many men probably earn cash only infrequently by this method; some may earn perhaps as much as $100 in a single year.[1] On the whole, income from the sale of plumes is probably small for most individuals. There appear to be few if any men who devote much of their time to a commercial trade in plumes. Plume holdings are often considered to be a readily available asset to be converted to cash in times of need or emergency. Thus, a number of men described Paradisaea minor as p.e. takis mani (tax money), since the cash value of a newly killed specimen nicely covers the tax rate in the upper Jimi. ($4 per audlt male).

When one talks to the people one gets the impression that the sale of plumes is of much more economic importance in the cash economy than in fact seems to be the case. Informants were constantly saying that the sale of plumes was p.e. bisnis bilong mipela (our business), and a little less frequently, p.e. namba wan bisnis (most important business).[2] In part this emphasis on plumes as bisnis may stem from the fact that the seller can obtain a fairly high monetary return for little if any effort, if he sells to avisitor. If birds are hunted specifically

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1. E.g. a man with access to the north fall of the Bismarks may easily shoot 10 paradisaea minor in a year and sell them for $10 each.
2. Of note,here, however, is the use of the p.e. terms salim (sell) and baiim (buy), which are used to refer to exchanges of goods as well as transactions involving cash.

for the plume trade, then considerably more effort is involved, as is the case if a man hawks his plumes for sale in different settlements. But the fact remains that few men seem to go hunting with the aim of gaining plumes for sale in the short term. Generally they seem content to use plumes for their own decoration for a time. In fact, to obtain satisfactory decorations is often a prime reason for the hunt or trading expeditions rather than to engage in commercial transactions. In relation to the number of transactions of plumes for which I have some information, cash sales constitute only a small proportion of the total. (About 30% or less).

Coffee sales provide the most regular source of income for most cash earners. But most informants are disappointed with their return from coffee. Moreover, income from coffee probably varies considerably from settlement to settlement. For the study area there are only three outlets for coffee beans. These are at Kol and Tabibuga where beans are sold to commercial coffee buyers, and Koinambe, where beans are bought by the Department of Agriculture, Stock and Fisheries. Settlements situated furthest away from these markets generally have fewer coffee trees. For individuals selling their coffee through Koinambe, it has been estimated by Mrs. Pauline Pearson of the Anglican Mission (personal communication), that income is no more than $30 per year. Many individuals earn considerably less, while those living near Tabibuga (on both sides of the Jimi) may earn rather more from coffee.

Returning labourers seldom seem to bring back more than $100. Mrs. Susan M. Pflanz-Cook (personal communication) has kindly provided some data on the earnings of contract labourers from Kwiop. On returning from a two year contract the labourer receives an average of $65 in Mt. Hagen which has been deducted from his wages during his period of contract. Of 24 labourers on 28 contracts during the years 1960 to 1971, the average amount of cash brought back to

Kwiop was $85.94 (the extremes being $182.07 and $40).

Most but not all settlements visited have at least one trade store operating, and some of these stores seem to make a considerable profit. A few men earn money in employment on Mission and Government Stations.

A fairly flourishing trade in cassowaries exists in the Jimi. Cash values range from about $10 for chicks to $100 or more for adults. Some men make expeditions to the Pint Basin and further downstream to buy cassowary chicks (usually for less than $10) and sell them to visitors from the Wahgi and Chimbu areas. Some men who p.e. wokabaut strong (are energetic, strong) carry chicks and adult birds to Banz, Minj and Nondugl and beyond where they say they can get up to $200 for an adult bird.

While other sources of cash appear to outweigh income from the sale of plumes for most men, the sale of plumes undoubtedly is of significance to the people, who lack any regular and secure means of cash income.

8. TRADITIONAL TRADE AREAS

In this section are described the traditional trading patterns within the study area. In this context, by traditional can be understood "pre-contact". A comparison of contemporary trading patterns with pre-contact patterns will be presented in section 9.3, where it will be shown that contemporary patterns are to some extent traditional insofar as they operate along pre-contact routes, mediated through traditionally important links (trade-partners, affines, etc.).

The trade areas to be discussed below are delineated on the basis of the total data on pre-contact trade gathered for the study area as a whole, rather than on the basis of informants' statements about regional differences in trading patterns. While informants are well aware of the various different flows and counter-flows of goods in the Jimi, none identified specific areas in which one pattern of flow differed from another area.

Data on pre-contact trade are by no means as complete as they could be, and the quality of information varies greatly for different settlements. However, data seems sufficient to permit a rough delineation of trade areas, distinguished primarily on the directions of flow of goods, and the types of goods they introduce into the study area. Trade areas to be discussed are indicated on Map 4.

Europeans entered the Jimi for the first time probably in 1930 or 1931 when two prospectors working up the Yuat reached apparently as far as the Jimi Karam area before crossing the Bismarks to the Ramu (Hughes, 1971: 102-103). The Sepik-Wahgi Divide was first crossed in May, 1933 by J.L. Taylor and Mick, Dan and Jim Leahy from the Wahgi. The party travelled down the Tsau River, returning to the Wahgi up the Ganz River to the west.

In June the party again entered the Jimi, this time by way of the Baiyer River, returning by way of the Mogulpin (Hughes, 1971:112). On both occasions, though steel axes were offered in payment for food, only shell items were accepted. Among the Tsembaga Maring of the Simbai Valley, north of Tsuwenkai steel tools began to arrive in the late 1940s and had replaced stone tools by the early 1950s. (Rappaport, 1968:9). The arrival and acceptance of steel tools in the Jimi, obtained from the Wahgi no doubt occurred in the 1930s and 1940s although complete replacement of stone tools by steel may not have occurred till the 1950s (Dr. E.A. Cook, personal communication).

8.1 Eastern Area

This area includes the settlements of Kosap and Bubgile on the north bank of the Jimi, and, beyond the study area, as far south as Kol. The boundary of this area might well be extended further south, but there is no data to warrant this.

The major plume resources of this area were Paradisaea minor, Astrapia stephaniae, and Epimachus spp. The Kamam had almost a monopoly on the hunting of Paradisaea since these were uncommon in the Jimi, and only the Kamam appear to own land in the Ramu fall where Paradisaea is plentiful.

Informants listed four varieties of stone axes. Three were of black stone: ambaming, apiyamp, and kunjan; the fourth, polimp being of 'white' stone. All these axes blades were said to originate in Tsenga, although one informant did admit that he was not sure of this. From Tsenga the axes were said to reach Bubgile via Tabibuga, Magen, Kelunga, and Kosap. Comparison of terms I extracted for different axe varieties with those recorded by Chappell (1966) and Hughes (1971:fol.312) indicates, firstly, that I do not have a full record of stone-types employed (Hughes lists seven separate terms), and secondly, that as one informant suspected, the Tsenga quarries may

not have been the sole source of supply. The Abiamp quarry near the Tuman River on the northern slopes of the Kubor Mountains (Chappell, 1966:102), is possibly the source of ambaming and kunjin. The nearest equivalent to ambaming in Hughes's list is the Kuma term ambumun, and in Chappell (1966:103), umbamn. Kunjin is Hughes's kunjen and Chappell's kujn. These Abiamp axes probably entered the Jimi in the Kauwil region coming to this eastern area via Korendiu and Magen. Thus this direction of entry may have been similar to that of Ganz-Tsenga axes. Neither Hughes nor Chappell record the term apiyamp, nor any term that might be taken as cognate. This term could well be derived from Abiamp, from where apiyamp axes may have come. The 'white' stone polimp is possibly the same as porumb geru recorded by Hughes as a very light green axe from the Ganz-Tsenga quarries.

The main exchange items for axes in this region were pigs and the plumes of Paradisaea minor, Astrapia stephaniae and Epimachus fastosus.

Salt (ap) was said to have come from the Simbai, entering the Jimi by way of Kwima. This knowledge of the salt trade may have been learnt since contact. Hughes (1971:161-162) notes that Kandawo informants told him that two salt springs were located north of the Bismark Crest, one on Igili Creek which flows into the Marum River, and the other near the Mambu River used by the Aindem clan. Hughes's informants added that they thought that the springs had not been used for making salt.

Pigs and p.e. kina (pearlshells, Pinctada maxima) were the usual exchange items for salt.

Pigments (tolimon) used for decorating the body were mostly obtained by trade. In addition, an orange clay was, or at least, is in the present day obtained locally. The 'blue-black' pigment pini is said to have been obtained from Kwiop and Togban, although the source is

unknown. Information gained elsewhere suggests that this direction of trade is probably incorrect and that it is more likely to have reached the Eastern area from the Wahgi. Hughes (1971:224-225) notes a lustrous black pigment originating in the upper Chimbu Valley known as gamba pine in Chimbu and pine pogo in Gende to the north east of Mt. Wilhelm in the Ramu fall. Apparently the same pigment is known as pini poga in Narak and peni poka in Maring.

The 'blue' kum is said to have come from the direction of the Wahgi via Nondugl and Karap. Bubgile obtained kum from Karap and Kol. The source of kum would appear from Hughes's data (1971:222) to be in the territory of the Gena Nogar tribe of the Chimbu people, in the headwaters of Singga Migl River. Informants stated that 'red' pigment, borima came along the same route as kum.

Bira, a blue or black pigment, was obtained from downriver. Data gathered in the Northern area (Kwima-Bokapai region) places the source of origin in the Kompiai area.

Plumes and mammal skins seem to have been the major exchange items for pigments. In general, plumes of the long-tailed Paradisaeidae and probably Charmosyna skins were used in the trade downriver, while Paradisaea minor predominated in the trade with the Wahgi. The main mammal skins were probably those of Phalanger maculatus and perhaps P. atrimaculatus.

Pigs and Paradisaea raggiana were obtained from the direction of the Wahgi. The main inlet areas to the Eastern area were Karap and Nondugl. Bubgile obtained these items from Kol, Olna, Manz, Megilpol, and Karap. Shell items, particularly kina, and probably cowries and green snail shell also followed the routes along which pigs and raggiana were traded. Trade in shell items no doubt increased in volume some time in the 1930s following the injection of large numbers of shells into the main Highland valleys by early missionaries, prospectors, and government officers. Data from other trade areas in the Jimi

supports this conclusion.

The dominant traditional trade routes were thus along the north bank of the Jimi, from the south from Nondugl, and from the west from the Karap-Magen area. This Eastern area was a major region for the introduction of shell items and pigments, and to a lesser extent plumes and some axes into the study area. Major items leaving the study area via this trade area were plumes, especially of Paradisaea minor. The transfer of goods was effected mainly through trade-partners, affines, and in bride-price.

8.2 Southern Area

The southern area embraces the Kwibun-Tabibuga area and extends westwards to Wum, and possibly beyond. Detailed information on pre-contact trade is least satisfactory for this area although a few general statements can be made.

Stone axes obtained from the Ganz-Tsenga factories, and probably also from the minor quarry at Maegmol passed through Kwibun and Tabibuga to people of the Northern and Central areas. Salt originating in the Simbai was often the exchange item, although plumes, especially of Psittrichas, Paradisaea minor, Astrapia and Epimachus were also employed. Several settlements of the Northern area had ties of friendship and intermarriage with the people of Tsenga, and thus bypassed the "services" of the people of this Southern areas as intermediaries in the stone axe trade. It seems that the major flow of axes from this area was to the Central area, where many men had trade partners and affines. Some axes and salt were also said to travel up towards the Wahgi via Karap. Plumes of Paradisaea raggiana reached Tabibuga from the Banz area, and it seems that some Morkai men of Tabibuga journeyed as far as Banz on trading expeditions, carrying stone axes, salt, and plumes, especially of

Paradisaea minor, returning with raggiana and probably a few shell items and pigs.

Both kina and cowry shells, and some pigments were traded to the Northern and Central areas from Kwibun and Tabibuga. All these goods entered the Jimi from the Wahgi.

The Southern area, then is a major point of entry for stone axes and shells into the study area, and to a lesser extent, plumes. It also provided the major outlet area for salt. Trading links were predominantly in an east-west direction, across the Jimi and Tsau Rivers, between Melpa, Narak, and Maring speakers, and north-south along the Jimi-Tsau divide to the Wahgi, between Narak and Kuma speakers.

8.3 Central Area

This area stretches along the north bank of the Jimi from Togban to Kelunga.

It has already been noted in the previous section that stone axes entered this area from the Southern area, and that Simbai-produced salt was often given in return. From Kwiop, stone axes were occasionally exchanged for plumes with traditional Kompiai allies. One Togban informant stated that he had obtained stone axes in exchange for the plumes of Paradisaea minor from Karap, Kelunga, and Bubgile. These axes may well have originated in the Abiamp quarries, although one cannot take immediate direction of trade as indicating the direction of the source area of an item.

The Manga obtained salt from the Tugumenga in exchange for pigs and kina. One Ogona informant said salt was obtained from Bank in the Simbai in exchange for pigs, kina and stone axes. This may be knowledge gained after pacification. It seems likely from other informants' accounts that there were few trade relations between Simbai groups and people of the Central area, and that Ogona salt was mostly obtained from Yomban allies.

Kina and cowry shells were obtained from both the Eastern and Southern areas in exchange for pigs and the

plumes of Paradisaea minor. Some other plumes, notably of Psittrichas (obtained from the Northern area, mainly for pigs and shell items), were also offered in exchange for shells.

Plumes of Charmosyna, Epimachus, Astrapia, and Pteridophora were obtained locally and also from the Eastern area. Some also were obtained from the Northern area, particularly by the Yomban.

Paradisaea raggiana came from both the Eastern and Southern areas, in exchange for pigs, Psittrichas and Cacatua plumes, and cassowaries. One half grown cassowary chick was said by an elderly Manga informant to bring about 10 raggiana plumes in exchange.

Pigments seem largely to have been obtained in exchange for plumes. In particular, Charmosyna papou was listed as a favoured exchange item for pigments. Charmosyna skins were obtained locally, and from both upstream and downstream. The 'blue' kum pigment was obtained from the Morkai, and also, it seems from the Eastern area. The lustrous black pɨni poga was said by Manga to have been obtained from Mogine and Karap. A narrow bamboo tube about six inches long - roughly enough to last six months, was valued at one Charmosyna skin. The places of origin of kum and pɨni poga have been given in section 3.1. The red pigment kalom was said to come from Bubgile and Kol. Deposits of kalom were said to occur near Kol, although informants in Bubgile made no mention of this. Two small leaf bundles or two bamboo sections about one inch in diameter could be exchanged for one Charmosyna or Lophorina skin.

Plumes, mainly of Paradisaea minor were the only goods added to the stock of circulating goods in this area. The Central area does not appear to have been a point of entry for many trade items to the study area, but was rather a centre for the consumption of goods

injected into the trading network from the other three areas. In addition, people of this area acted as intermediaries in the flow of goods between the other three areas. Through this area, axes moved both north west and south east into the Northern and Eastern areas, while salt was traded through to the Eastern and Southern areas. Plumes of high altitude species seem to have entered this area from the Eastern area, but not been passed on to other areas to any significant degree, with the possible exception of the Southern area, where plumes were sometimes exchanged for stone axes. Plumes of low altitude birds generally seem to have been traded from the Northern through to the Eastern area. Shells, entering from the Eastern and Southern areas were passed on to the north west.

8.4 Northern area

This area is composed of the settlements bordering the Pint Basin, as well as Kwima and Ndega. All are Maring speakers.

Almost all the salt entering the study area was channelled through this area. Salt was said to be extracted from a spring near Bank, north of the Simbai River. Three recorded Maring terms for salt are kura bungga, kura limeng and timbinangen. bungga and limeng may be two varieties of salt (kura), while timbinangen may be a term related to the Karam term for salt which Hughes (1971:162) records as tumbei. The Tugumenga obtained salt from Bank in exchange for stone axes. They also obtained salt from the Kauwatyi, who in turn got it from the Tsembaga. Manamban informants stated that they mainly obtained salt from Andikoi in the Simbai while the Tugumenga got it from Gai. While stone axes were the usual exchange items, pigs and cowry shell headbanks and ropes were also offered.

All informants[1] of this area stated that they had

1. This statement applies to Kompiai, Kupeng, and Kwima. The same is very possibly the case with other settlements.

direct ties with Tsenga, obtaining axes from Tsenga trade partners or affines. Comparison of axe names recorded with those listed by Chappell (using data made available by the Rappaports) (1966:114) and Hughes (1971:fol.312) suggests that some axes may have originated elsewhere. dangunt, which appears to be called porimbandangunt by some seems to be from the Ganz-Tsenga quarries, as is gema. kira stone may, on Chappell's data, be from Abiamp, Ganz-Tsenga, or Mala Gap on the Sepik-Wahgi Divide in the headwaters of the Ganz River. Hughes records no such term. A green stone variously termed kunjinambameng and kunjinambangunt is of interest. Hughes records the terms könden for a green-black, and kundjan for a green stone quarried from Abiamp. Chappell records knd'n for an Abiamp stone. It seems possible that these five terms are referring to stones of the same origin. In support of this statement, it might be noted that Chappell assigns the majority of axes designated as knd'n by informants to the Kunj Umbamn petrographic group. Kunj and Umbamn are Melpa terms for two different greenish rock types suitable for axe making (Chappell, 1966:103), and it seems likely that my informants were applying these terms, or variations of them, to the axe types they were describing. Neither Chappell nor Hughes record the axe types kanjipra or goikala, said to come from Tsenga. One old Manamban man said that the axe golum was manufactured in the Pint Creek behind Koinambe, and could be obtained in exchange for various plumes, including Domicella, Psittrichas, Pteridophora, Lophorina, Paradisaea minor and the long-tailed Paradisaeidae. One Kauwatyi informant stated that kopiama axes could be made from stones to be found in the Pint Creek and its tributories. I was given similar information in Bokapai.

It seems that stone axes were generally obtained by the people of the Northern area in exchange for plumes, particularly of Paradisaeidae, rather than salt.

Extensive trading relations with Simbai groups, from Kinimbong in the west to Pogaikump in the east were maintained for the purposes of acquiring plumes. Affinal ties and ties of alliance for the purposes of warfare were also maintained with these groups. The main items of exchange were pigs, stone axes, and shells. Most plumes obtained were of lower altitude species, particularly of Domicella, Psittrichas, and Paradisaea minor. Feathers of Aceros and Henicopernis were also obtained, and all these plumes were passed on to the Tsenga who had little access to many of these species.

Kina and cowry shells were obtained from the Southern and Central areas in exchange for plumes originating in the Simbai. In addition, plumes of high altitude birds, especially of Astrapia and Epimachus were also traded. In the Central region, this flow of high altitude plumes seems to have slackened off at about Togban in the face of the downriver movement of the same plumes from the Eastern area.

The shell mengga (probably Cypraea spp.) was traded up from the lower Jimi.[1] The people of Kandambiamp were said to have obtained these shells from Tsendiap, and to have traded them through to the Northern area. Pigs, and the plumes of Epimachus, Astrapia, Paradisaea minor, Psittrichas, Charmosyna papou and C. josefinae were traded for mengga. It was also obtained in bride-price.

Pigments (minyamo) traded in from the Southern and Central areas were obtained mostly for plumes of Paradisaea minor, Pteridophora, Lophorina, Henicopernis, and Aceros, and for skins of Phalanger maculatus. The pigments kalom (red), muk (green),[2] and peni poka (black) entered the

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1. Clarke (1971:97) records a similar direction of trade, and identifies the shell involved as Nassa sp. He gives no vernacular, however. My own identification here is based on a matching with the Maring term I recorded with that listed by Hughes (1971:foll.317). My informant may himself be in error in his use of the term mengga.
2. Professor Ralph Bulmer (personal communication) notes that this term is applied to a 'blue' pigment by the Enga and Karam.

Northern area from both sides of the Jimi. The yellow mondopiya was said to come from near Bank in the Simbai, and was obtained for cowry shells. One Manamban man said that the 'blue' bira could be gathered "for nothing" from Kauwatyi ground when these two hostile groups were enjoying a temporary truce.

Prior to contact, the plumes of Paradisaea raggiana do not appear to have been traded north of Kwibun and Kwima. The Tugumenga gave salt to the Molema and Manga in exchange for raggiana plumes.

The main feature of the trading networks of the Northern area is the extensive links with apparently all Simbai Maring clan clusters. As such, this area provided the major inlet point for a variety of lower altitude plumes not available in the Jimi, and for salt from springs near Bank. This area also provided the major outlet point in the study area for axes and shells.

8.5 The Overall Trade Picture

The foregoing data on pre-contact trading networks can be summarized as follows. Stone axes entering from the west travelled to the north and east, while salt, entering from the north, passed westwards to the axe makers, as well as south and south east in opposition to the flow of shells entering from those points. The flow of goods is shown on Maps 5 - 10. Map 10 showing the pre-contact trade in pigs has also been added for comparison of a ubiguitous item with valuables and utilitarian items highly localized in their occurrence. This map indicates that pigs were not as "ubiquitous" as informants suggested. Most informants stated that their requirements of pigs for trade were met by the natural increase of their own pig herds. Further questioning generally indicated that pigs were also obtained from the south, many probably entering the study area from the Wahgi. Within the study area the dominant flow of pigs seems to have been downriver, passing

westwards through the Southern area to Tsenga, and north across the Bismark Crest into the Simbai from the Northern area.

Bird plumes were the only item of value occurring in the study area which were contributed to the trade system. Plumes flowed along the trade routes of other valued goods. Values goods were generally traded across the grain of the country, a feature which Rappaport (1968:100) has pointed out. That is, goods tended to flow across major topographic barriers - rivers and mountain ranges. Within the study area, however, goods also travelled along lines of least topographic resistence, that is, parallel to ridge crests and rivers. This movement was most evident in the Central area which served as a zone of transfer of goods crossing the Bismark Crest to the north west, the Tsau-Jimi divide to the west, and the Sepik-Wahgi Divide to the south and south east.

9. CONTEMPORARY TRADE IN PLUMES

9.1 Sources of Data

Data presented in this section are primarily drawn from the census sample of 185 collections of plumes examined in ten settlements. In addition, 50 case histories of trade in plumes were collected. 16 of those informants providing case histories are not represented in the census sample while the remaining 34 are so represented. It must be pointed out that very few of the case histories collected are complete. It was often difficult to get informants to list the precise numbers of different plumes they had owned, where they obtained them from, and to where they had passed them on. In some cases it seems likely that informants could not remember the precise number of different plumes they had owned, let alone the details concerning the transfer of these plumes. Other informants clearly did not want to be drawn into a long, detailed discussion of the history of their plume possession, and tended to give vague, general statements. The necessity of my moving to new settlements every few days reduced the amount of time available for collecting detailed case histories. Thus, general statements of informants have been relied upon to a large extent. These statements, in addition to data collected in the course of plume censuses and the collection of case histories, will be employed in outlining trading patterns.

During the first period of fieldwork in the Pint Basin little emphasis was placed upon censusing of plumes and collection of case histories as a means of obtaining data. Much of the information on plume trade in this area was obtained by eliciting statements from informants of the general plume-trading relations of different settlements. While more reliance was placed on plume censuses and case histories during the second period of

fieldwork, even so, more emphasis may have been placed on censuses and case histories as a means of acquiring data. The brief time spent in each settlement, however, limited the amount of this work that could be conducted. It was felt that generalized statements about the plume trade should also be collected so as to indicate and offset any bias of data that might occur if censusing and histories were the sole means of data collection.

The census sample is biased insofar as not all settlements are represented by an equal proportion of the total sample. Thus, for instance, in two days spent in Togban, I saw 64 collections, while in the comparable time spent in Koriom, only 8 collections were censused. Nonetheless, data for plume trade in Koriom is probably more complete, since more time was available to collect additional information in the form of case histories and generalized statements on trade. In some settlements very few men were interested in showing me their plumes, while in others great interest was shown. Many men denied owning plumes at present, or in the past. Later information showed that some of these statements were untrue. Unfortunately I kept no record of the number of males who claimed not to own plumes at the time of fieldwork. Thus, no indication can be given of the proportion of males owning plumes in each settlement. Even if this proportion could be stated it would mean little on its own, since there appear to be a number of variables affecting the likelyhood of plume possession. The age of a man has already been noted in section 7.1.2 as a variable bearing on the likelyhood of an individual owning plumes. Other variables would seem to be the amount of access of the individual to wild bird populations, as well as this access of trading partners or kin who might provide him with plumes; the number of pigs or wealth items, or the amount of money he possesses which might be exchanged for plumes; whether he is married and thereby increased the number of

kin to whom he might be expected to give plumes; whether he has kin who owe him obligations (e.g. sister's son's, or those whom he has helped to pay a bride-price); and proximity in time to social occasions at which decorations are appropriate.[1] This list could probably be extended further.

Possessing plumes as opposed to not possessing plumes is itself a crude measure. The different species owned, their numbers, quality, and length of possession all vary, not only in relation to the variables listed above, but also areally. Thus, for instance, the types of species represented in Kamam and Yomban collections, as well as the quantity and quality of plumes in each individual collection vary considerably. In part, these differences may be due to different tastes and styles of decorations obtaining between the two populations.

The census sample is non-random in that only those individuals who wished to be included in it, and were not settled at such a distance from my own field location in each settlement as to make visits to view plumes too time consuming were included. Data on the variables outlined above were not gathered in a systematic fashion, although it is available for different individuals to varying degrees. The census sample, then, can be regarded only as a biased sample of the population of males who do, or might own plumes.[2] However, informants' statements about the general flow of plumes to and from their settlements in the main support patterns suggested by the data collected by means of censuses and case histories.

The percentage representation of the census sample for three different universes is shown in Table 10.

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1. E.g. few, if any men owned Astrapia plumes in Tsuwenkai at the time of my visit since they had all been traded out after the Christmas festivities were over.
2. Some women and children own plumes, but their numbers are small. Plumes are on the whole an item of male ownership.

Percentages refer to adult males represented in the sample. Population figures for adult males (16 years and over) are taken from official census records.

Table 10
Representation of Census Sample

Universe 1 Census Settlements (Individually)	Male Population (16 years +)	Collections, Males Censused	% of male Population
Bubgile	385	44	11.4
Koriom	142	8	5.6
Kwiop	124	12	9.7
Togban	253	49	19.4
Kwima	343	29	8.5
Kupeng	197	8	4.1
Kompiai	305	5	1.6
Bokapai[1]	209	2	1
Tsuwenkai	82	6	7.3
Universe 2 Census Settlements (Collectively)	2040	163	7.99
Universe 3 Total Study Area	3125	163	5.22

The sample therefore ranges in its representativeness within settlements from a ratio of almost 1:5 (for Togban) to 1:100 (for Bokapai). For all settlements where censuses were conducted, representation averages almost 1:12, and for the whole study area, a little over one male in every twenty is represented in the sample.

9.2 Patterns of Transfer of Plumes

Data for this section are drawn primarily from the census sample and case histories. Appendix 3 lists for those species for which adequate information is available the total number of plumes transferred to and from each settlement where

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1. Despite the low number of censuses, Bokapai is included because several case-histories, supplementing censuses, were collected. One collection was reviewed in Mogine, and few case histories collected. Mogine has therefore not been included in this or following tables and appendices.

censuses were conducted. Origins and destinations of each transfer are indicated, although transfers occuring between members of the same settlement are not included. Such transfers constitute only a minor proportion of the total flow of plumes.

The units of items here considered as being transferred are those parts of birds listed as being utilized in Table 8. Thus units of transfer of Charmosyna papou are, in the main, individual skins, while for Psittrichas the units are of collections of body or wing feathers recorded as being transferred in a single bundle. While a single transaction between individuals or groups (such as in a bride-price payment) may consist of a number of plume units of one species, each unit is regarded as a single transfer in the following tables, rather than the sum of the units involved in the transaction, so as to indicate the volume of plume transfers.

In Appendix 3 a total of 1094 transfers are recorded. Many of these are entered twice - once for the settlement from where they were transferred, and again for the settlement importing the plumes. Since in the following pages the discussion will centre on the flow of plumes to and from each censused settlement this duplication of recording is unavoidable. Such duplication, however, only occurs where a transfer has been made from one of the nine censused settlement to another. Some 40 or so settlements and urban centres are listed in Appendix 3, and transfers of plumes between only nine of these have been recorded twice.

The Appendix also shows the number of plumes shot by, and retained by their present owners. For some species, some specimens were shot near Port Moresby by men on indentured labour. This is indicated in a footnote to the tables where relevant. Of the 1094 transfers recorded many had been shot within the study area. Precise figures, however, are not available.

Not included in the transfers above are 36 for Domicella hypoinochrous, and nine for Cacatua galerita. Skins and feathers of these two species are not traded to any great extent. Many Domicella, however, are shot or bought by indentured labourers working on the Gazelle Peninsula, and are commonly transferred to agnatic kin as gifts by the returning labourer. However, there is little flow of Domicella skins between different settlements. A few skins have entered the study area from Simbai Valley settlements of Kenmongger, Ambiap, and Tenggenai to Kupeng and Kwima. These are apparently of birds shot by Simbai Valley Maring. Alternatively, these Simbai groups may have obtained the skins from the Aiome area in the Ramu. Some Simbai groups appear to maintain trading links with the people of the Aiome area. One man of Koriom had obtained a Domicella skin while working in the Baiyer River area. This was given to him by a European friend who had shot it.

Similarly, feathers of the Cockatoo, Cacatua galerita are seldom transferred. Most feathers of this species represented in collections were from birds killed by their present owners. Of the nine sets of feathers transferred, two had moved upstream within the study area, five had entered the study area from the Simbai Valley (two to Kwima, one to Kupeng, and two to Bubgile), while two had been bought at Koki Market in Port Moresby. In addition, one had been shot by a European engineer working on the bridge across the Jimi River on the Tubibuga-Kwiop track and had been given to a Koriom man.

Plumes of other species exploited that are not listed in the following tables are of little importance. Numbers represented in the census are small (see Table 4) and few plumes are traded, but are taken from birds killed in the bush.

161 plumes have been shot within the territories of the nine settlements where censuses were conducted. These 161 plumes have been retained by those who originally shot them.

The total number of plumes represented in the census and case histories is thus 1,253. Of this total, 12.9% have been shot by and retained by their present owners. The remaining 87.1% of plumes have been transferred out of the clan cluster territory in which they were originally obtained, or been imported from beyond the study area.

Appendix 4 lists for the ten most commonly traded species the direction of flow in respect of the nine settlements where censuses were conducted. Figures are based on data presented in Appendix 3. The number of birds shot in each settlement has been added to the total of "incoming" plumes. Transfers of plumes within settlements are not included. The directions "upstream" and "downstream" refer to the direction of flow in the Jimi relative to each settlement. "Cross-Jimi" refers to roughly east-west movement of plumes. Any settlement east of a line running north-south through a settlement for which plume-flow directions are being considered, is here regarded as being "upstream", even if it lies on the south bank of the Jimi. Thus, for instance, Karap is upstream relative to Kwiop, but cross-Jimi relative to Bubgile. All settlements east of a north-south line through Kelunga are here regarded as upstream of all other settlements considered here. Centres in the Wahgi Valley within walking distance from the Jimi (e.g. Minj, Banz, and Nondugl) are treated as being upstream. The justification for including the Wahgi and the settlements to the south of Kelunga and Bubgile as "upstream" is that I have no records of plumes being transferred up the Jimi beyond Bubgile. Rather, plumes move across the Jimi and up to the Wahgi via Nondugl. Downstream in all cases indicates movement along the north bank of the Jimi, and south of the Bismark Crest.

Settlements beyond the normal range of foot travellers fall into the "other" category. Port Moresby, Rabaul, Lae, Madang and Mt. Hagen make up this category as far as the

data under consideration here are concerned.

The actual settlements from which and to which plumes are transferred are listed in Appendix 3, along with the number of transfers involved for each species. A number of points emerge from Appendices 3 and 4. The transfer of individual species will be considered first. Some statements concerning the overall flow of plumes to and from settlements where censeses were made will then be presented.

9.2.1. Transfer of Valued Plumes

9.2.1.1 Charmosyna papou

The majority of the skins of this species (68%) were obtained in or near Port Moresby by indentured labourers. Some men had shot them on the Sogeri Plateau, others having bought them at plantations where they worked, or in Port Moresby, generally in Koki Market. In all, about 10% (19) of skins of Charmosyna for which information is available had been shot in the Jimi. Mostly the remainder had been obtained by trade or gift within the Jimi, from settlements downstream or cross-Jimi. Many of these had probably been obtained in the Port Moresby area. Charmosyna is a popular species brought home by returning indentured labourers as gifts for kin.

Charmosyna skins are also imported from the Wahgi. Some come in bride-prices to Narak and Kandawo of the study area. One informant from Olna stated that some men travel to Kundiawa, Chuave, and Goroka in search of plumes. Charmosyna are sometimes bought by these traders.

It is the coloured phases of Charmosyna that are particularly favoured. Perhaps an indication of the importance of the Port Moresby area as a source of skins of this species is that informants state that predominantly red Charmosyna are "Papuan", while the melanistic phase is "New Guinean". Certainly the majority of coloured phase

skins examined had originally been obtained from the Port Moresby area. It has been noted in section 4.2.15 that some coloured Charmosyna are present in the study area, though melanistic specimens seem to be more common.

9.2.1.2 Psittrichas fulgidus

Only 5 (3.7%) of the feathers of this species were obtained in land claimed by people of the study area; 35 (38%) had been obtained direct from Simbai Valley groups, in whose territory the species seems common. Nearly all other collections of feathers of Psittrichas have moved upstream. This trend is shown most clearly in the Outgoing column in Appendix 3. Although all settlements have obtained the species from the Simbai Valley, Kwima and the settlements surrounding the Pint Basin obtain the greatest proportion of their Psittrichas plumes relative to other Jimi groups from this source. This assertion is born out by informants' statements of general trading patterns. In this connection it is to be noted that these Jimi groups have traditionally maintained ties of intermarriage and mutual aid in hostilities with a number of Simbai local populations. Ties of settlements upstream of Kwima with Simbai groups seem to be mainly a post-contact development. The major incentive for such ties seems to be for the purpose of acquiring the plumes of lower altitude birds, especially Psittrichas. The cross-Jimi transfer of Psittrichas to Koriom and Kwiop were, in both cases, a single transaction in the form of gifts from affines.

Kamam are said to travel to Kundiawa on occasion and buy Psittrichas in the market there. It is said these plumes came originally from Lae, but some are no doubt traded in from the Gende of the Bundi area, with whom the Chimbu traditionally maintained trade links (Brookfield and Brown, 1963:65; Nilles, 1943:11).[1]

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1. These authors do not list Psittrichas among plumes obtained from the Ramu fall, although these are liekly imports.

Visiting Chimbu traders themselves buy Psittrichas feathers when they visit the Jimi.

Simbai Valley groups sometimes travel up the Jimi to exchange their Psittrichas feathers for pigs, kina, or money. Some Jimi people, for instance from Tabibuga and Koriom, sometimes journey to the Simbai Valley to trade for Psittrichas and other plumes.

9.2.1.3 Tanysiptera galatea

As with Charmosyna, the greatest single source of Tanysiptera is Port Moresby (43% of incoming plumes). This species is also a favoured gift of returning labourers to kinsmen. Within the study area the overall pattern of flow of skins of this species is upstream. Many of these skins have probably been obtained in the lowland forests downstream of Kompiai. The Simbai Valley is also an important source of plumes of this species.

9.2.1.4 Epimachus fastosus

The total of 38 cases is a rather small figure upon which to base valid generalizations. The figures suggest a general flow of Epimachus plumes upstream, some originating in the Simbai. Informants' statements on trading patterns, however, support the inferences of the statistics.

9.2.1.5 Epinachus meyeri

In the absence of more data on this species, one cannot argue from the statistics available. The species appears to be only infrequently transferred. Because of its rarity throughout the study area it is seldom shot. The indications are, however, that the patterns of transfer of meyeri is primarily upstream.

The one specimen seen in Kwiop had come from Banz as part of a bride-price, while the Togban specimen had been bought in Port Moresby for $4. In addition, a Tabibuga man had bought what appears to be from his description,

meyeri plumes for $2 in the Kaironk Valley.

9.2.1.6 Astrapia stephaniae

The plumes of this highly valued species are transferred over a considerable area. Of plumes censused, 16.9% (32) had been shot in the montane forest by their present owners. Within the study area, the flow of Astrapia plumes shows a definite break in the Togban area. In Togban, while most Astrapia plumes are obtained from downstream and the Simbai (34% and 4% respectively), a fairly large proportion (26%) also come from upstream. Below Togban, the dominant direction of flow is upstream. Many of these plumes have originally come from the Simbai, but probably a larger proportion are obtained in the forests surrounding the Pint Basin, where Astrapia appears to be fairly common (see section 4.2.4). Upstream from Togban the predominant direction of flow is downriver. While some of these plumes enter the Jimi from the Wahgi, the majority seem to be obtained in the forests around Kol and Manz.

It is interesting to note that the break in plume transfer at about Togban corresponds with the boundary between Narak and Maring speakers. Upstream, and cross-Jimi from Togban, the Narak and Kandawo include bird plumes in bride-price payments, while, for the most part, the Maring do not. Many Astrapia plumes in Narak and Kandawo areas are transferred in bride-price payments. It is possible that one of the reasons for the changing direction of Astrapia transfer at Togban is because plumes of this species are less often used in bride-prices paid to Maring groups. The fact that Astrapia plumes are employed for bride-price payments in addition to purposes of decoration and trade among the Narak and Kandawo, may in part explain the transfer of these plumes to a greater distance from their source of supply in the upper Jimi. Since Astrapia plumes are seldom required for bride-price payments among

the Maring, there is no need to retain a stock of plumes in the event of demands being made on an individual to contribute some plumes towards a bride-price. Thus there are more plumes available for trade. This is borne out by informants' statements in Pint Basin settlements. It was explained that once festivities were over, plumes which were readily obtained locally (including those of Astrapia) were traded out of the Jimi, mostly to the Wahgi people through Tabibuga, Kwima, and Togban. In Pint Basin settlements I was told that no particular efforts were made to obtain long-tailed species until another festival, (usually now associated with Christmas), was drawing near.

Where Astrapia plumes are used in bride-price, the flow of plumes as bride-price payments upriver and cross-Jimi somewhat obscures the dominant trend of downriver movement. There does, however, seem to be a tendency for more Astrapia plumes to be passed downriver, and cross-Jimi from the north bank in bride-price payments than in the opposite direction.

According to some informants from Wum, people west of the Tsau River obtain Astrapia from Karap. It is likely that many of these plumes have originated in the Manz-Kol area. These plumes are then traded from the Wum-Maegmol area to the Melpa of the Wahgi.

9.2.1.7 Lophorina superba

Of incoming plumes of this species 47.4% (27) had been shot in the Jimi by their present owners. Of those transferred, the great majority move upstream. Half of these have originated in settlements bordering on the Pint Basin, while some were obtained by Tugumenga and Manambar from Simbai groups. The small number transferred downstream or cross-Jimi (6) have gone as bridal decorations or gifts to affines, and (one case) in an exchange for a kina shell.

From the Bubgile area, Lophorina are transferred on to the Wahgi via Kol and Manz. On the whole, however, Lophorina

is plentiful in the territories of most clan clusters, and most local populations seem to be able to provide for their needs of this species from their own bush. The people of the Jimi do not seem to consider Lophorina as an important trade plume.

9.2.1.8 Paradisaea raggiana

The flow of raggiana plumes is unequivocably predominantly downstream or cross-Jimi from the Tsau-Jimi divide to the north bank of the Jimi. From Kwima on downstream, additional information supports the inference of Appendix 3 that raggiana plumes are transferred on to the Simbai. Some of the plumes viewed in Tsuwenkai had been bought in Mt. Hagen and Port Moresby.

It has been noted in section 7.1.1 that raggiana plumes are largely scorned by younger men now. This is particularly so of Kandawo and Narak. The species still seems quite popular among the Maring groups around the Pint Basin, and, by accounts, in the Simbai Valley. Practically all plumes entering the Pint Basin have come from the Tabibuga-Kwibun area. These are passed on to Simbai Valley populations.

Mr. Jack Edwards, A.D.C. Tabibuga, (personal communication) states that a major incentive for Jimi people contracting to work on plantations in the Port Moresby and Galley Reach areas is to obtain raggiana plumes. I found no such enthusiasm evinced. It is possible that Mr. Edwards was referring primarily to Melpa people to the west of the Tsau River. Plumes of raggiana are considered the most appropriate plumes for certain Melpa decoration sets (Strathern 1971:65).

9.2.1.9 Paradisaea minor

Of incoming plumes 30% (40) had been shot in the Jimi or Ramu fall lands of their present owners. Many more have been recorded as shot in the Jimi and subsequently

transferred. A further 24% (32) have been obtained from Simbai Valley Maring, who have almost certainly shot the birds in the Simbai. 42% (57) have been recounted as moving upstream. The remaining 4% (5) had come to the north bank of the Jimi from Tabibuga, or from the south (Bubgile to Kwiop, 1 case; Kol to Koriom, 1 case). One minor plume had been bought in Madang by a man from Togban. A large proportion of those plumes moving upstream have probably been acquired in the Jimi, the rest having been obtained from the Simbai. Most extensive links with Simbai groups for purposes of acquiring minor plumes are maintained by Kwima, Kupeng, Kompiai, and Tsuwenkai. In Tsuwenkai I was told that almost all of their minor plumes are obtained from the Simbai, since plumes from nearby Jimi populations are invariably passed upstream or across the Jimi to the people of Kwibun and Tabibuga. The upstream flow of plumes is particularly born out by the "outgoing" column in Appendix 3. This movement is well recognized by the people of the study area. Major outlet points are through Bubgile and Kol, and from Tabibuga. From these points, minor plumes are transferred to the Wahgi, especially to Minj, Banz, and Nondugl, and to visiting parties of traders coming to the Jimi from these Wahgi centres and from the Chimbu District.

One informant from Olna declared that "Hagen" people journey to Olna to obtain minor and other plumes. In the Jimi "Hagen" generally denotes the Melpa speaking people living to the west of the Tsau River. From the Wum area, the general flow of minor plumes, according to informants from Wum, is to Melpa speakers of the Wahgi. Kimil, Mala, and Mt. Hagen were among places mentioned. Some minor plumes from Wum also flow towards Banz. Many of these plumes are obtained initially from lower down the Jimi in the Timbunki area.

The general flow of minor plumes, then, is upriver towards the Wahgi, and cross-Jimi to the Tabibuga area, from where the plumes continue on to the Wahgi. Plumes shot

locally are added to the flow from all settlements of the study area except Tsuwenkai. Settlements making the greatest contribution appear to be those in the western part of the study area, the Togban-Koriom area, and Bubgile. An extensive area of the Simbai, from Kinimbong in the west to Popaikump in the east, and Bank to the north is tapped by the Maring of Bokapai, Tsuwenkai, Kompiai, Kupeng, Kwima, and Ndega for minor and other plumes. People of some settlements further upstream occasionally make trading expeditions to the Simbai Valley to obtain plumes. Informants tend to give the impression that such expeditions are more frequent than seems to be the actual case. The fact that such expeditions are relatively uncommon, but notable occurrences, probably serves to call them to mind when informants are asked to outline the directions of transfer of minor.

9.2.1.10 Pteridophora alberti

Tables in Appendix 3 and 4 show that the dominant direction of transfer of Pteridophora plumes is upstream. Of incoming plumes 31% (19) have been shot and retained by their present owners. 23% have come from Simbai settlements to Kwima (9 cases) Kupeng (2 cases) and Kwiop (1 case). One case of down-stream movement has been recorded (Kosap to Kwiop). The "outgoing" column in Appendix 4 confirms the upriver trend of flow.

Informants' statements confirm these conclusions drawn from statistics. It seems that some Pteridophora plumes are obtained by the Morkai of Tabibuga from the Wahgi.

9.2.2 Flow of Plumes to and from Census Settlements.

In this section the predominant directions from which plumes come and in which directions they are sent out are discussed. Data on the ten plume species discussed above will be incorporated. The species transferred will not be discriminated here, as the different directions of flow of

these have been examined above. Table 11 gives the percentage volume of the directions of plume flow to and from the nine settlements where consuses were made.

Table 11

Percentage Volume of Plume Transfer to and from Settlements

Settlement	Total	% Incoming from: Shot and retained in home territory	Downstream	Upstream	Simbai	Cross-Jimi	Other	Total	% Outgoing to: Downstream	Upstream	Simbai	Cross-Jimi	Other
Bubgile	309	24.3	23	9.7	10.4		32.6	35	88.6	11.4			
Koriom	121	23.1	46.3	18.2		3.3	9.1	11	36.4	63.6			
Kwiop	229	5.2	16.6	31.8	11.3	18	17	100	20	49	1	28	2
Togban	86	30.2	38.4	7	2.3	3.5	18.6	24		100			
Kwima	69	5.8	10.1	24.6	55.1	3	1.4	36		77.8	8.3	13.9	
Kupeng	62	1.6	9.7		22.6	3.2	62.9	53		100			
Kompiai	16		50	25	25			23	4.3	78.3		17.4	
Bokapai	13	53.8	15.2		30.8			20		90		10	
Tsuwenkai	31	25.8	3.2	22.6	29		19.3	11		90.9	9.1		

The majority of plumes entering the nine census settlements from centres listed in the "other" column of Table 11 are Charmosyna and Tanysiptera skins obtained by indentured labourers in the Port Moresby areas. As was shown in sections 9.2.1.1 and 9.2.1.3 there is only a relatively minor flow of these plumes within the Jimi. It is plumes obtained within the Jimi, and elsewhere with whom at least some of the local populations of the study area maintain ties that are traded most extensively within the study area.

Local populations can generally provide only relatively small amounts of their local needs of plumes at any one time. Figures for Kompiai (0%) and Bokapai (53.8%) have little meaning, since few plume collections were consused in these settlements (see Table 10). The Yomban of Togban have provided the largest number of plumes of their present collections from their own bush. In this connection it is of note that plume collections owned by the Yomban tend to be made up of fewer species than, for instance collections of the Manga or Tugumenga, and that the quality of plumes held is somewhat inferior. That is, there appears to be a correlation between the gross number of plumes held, the number of species represented, and the quality of these plumes, with the proportion of plumes obtained by trade. The greater the proportion of plumes obtained by trade, the larger and more varied are plume collections, and the better quality are most of these plumes.

A considerable proportion of plumes reach Kwiop, Koriom, and Bubgile from downstream. Plumes also come to these settlements from upstream. Given that the Kol-Manz area was said to be a major source area of Astrapia plumes the downriver flow of plumes may exceed the volumes suggested by the figures in Table 11. Census and case history material, however, has not illuminated such a flow to any extent. A fairly significant quantity of plumes have

entered these settlements from the Simbai Valley, mostly from Bank. Plumes entering the Kwiop-Bubgile area from the region between Kwibun and Korediu constitute only a minor proportion of the total flow. The "outgoing" columns of Table 11 show a very definite downriver movement of plumes from Bubgile, and an upriver movement from Koriom and Kwiop. From Kwiop, a number of plumes are transferred cross-Jimi to Tabibuga and Wanku to the south.

Below Togban the most important single source of plumes is the Simbai Valley. In addition somewhat lesser quantities of plumes come to these settlements from downriver. Plumes transferred out of these settlements move predominantly upstream. There is little flow of plumes from this area into the Simbai except for Paradisaea raggiana. A number of plumes recorded as originating in the Simbai may have in fact been originally obtained from the Kaironk and Schraders (Professor Ralph Bulmer, personal communication).

9.3 Comparison of Contemporary with Pre-contact Patterns.

In this section the dominant flow of plumes as outlined in section 9.2 above are compared with pre-contact trading patterns (see section 8). Contemporary transfer of plumes will be dealt with in relation to the four trade areas delineated for pre-contact trade. This does not presuppose any similarities between contemporary and pre-contact transfers, but rather, the approach is adopted to facilitate comparison and to throw light upon any similarities and differences that might exist.

9.3.1 Eastern Area

Substantial quantities of Paradisaea minor are contributed to the flow of plumes in this area (see Appendix 4). The majority of these are transferred upstream through the Kol area to the Wahgi. Astrapia stephaniae plumes are

also obtained in this area, although some are transferred from the Central area downstream. All Astrapia plumes recorded as leaving the various settlements of the Eastern area (see Appendix 3) have been transferred downstream. Most of these have gone to the Central area although one transfer has been recorded to Kwima in the Northern area. Other plumes recorded as moving downstream from this area are a few Charmosyna, to Togban in the Central area, and several Tanysiptera skins and Lophorina plumes to Kwiop, Central area. Paradisaea minor, Pteridophora, and Psittrichas plumes are occasionally transferred to the Central area. All Paradisaea raggiana plumes leaving this area have gone to settlements of the Central and Northern areas.

Most feathers of Psittrichas have come from the Central and Northern areas, and from the Simbai. These Simbai plumes were all obtained either by trading parties to the Simbai, or from visiting Simbai traders. Such expeditions are a post contact development of relations between these two areas.

While a small proportion of Paradisaea minor plumes are obtained from the Simbai, the majority come from the Central and Northern areas. The greatest number of minor plumes have been transferred from settlements of the Central area (see Appendix 3).

Centres beyond the normal range of foot travellers are the major source for Charmosyna and Tanysiptera skins, most of which have been obtained in or near Port Moresby. A number of Astrapia plumes have been obtained in Lae and Port Moresby.

Contemporary transfer of plumes, then, appears to be following pre-contact trade routes of plumes and other items. The principal links are downstream with the Central area. While plumes are passed on to the Central area, the majority are obtained from the Central area. Many of these are passed on to the Wahgi. Post contact

developments have been an extension of plume transfer from source areas in the Northern and Simbai areas, and transfer to areas of consumption in the main Highland valleys; notably to visiting Chimbu traders, to the Minj and Banz area, and to a lesser extent, the Melpa speaking area in the Wahgi to the west.

9.3.2 Southern Area

No censuses were carried out in this area, and few case histories were recorded. Most of the data on transfer of plumes to and from this area was gathered in other Jimi settlements, and from general statements of informants in Tabibuga, Tsinggoropa, and Waramis near Tabibuga.

The most important movement of plumes out of this area into other parts of the study area are of Paradisaea raggiana. Many of these have been obtained direct from the Wahgi. Two collections of Psittrichas plumes have been recorded as transferred from Tabibuga to Koriom, and seven collections from Wanku (south east of Tabibuga) to Kwiop. A number of Tanysiptera skins have been recorded as moving from Tabibuga to Kwiop. Twelve Astrapia plumes from Tabibuga and one from Wanku have been passed to Kwiop, and two Paradisaea minor plumes from Tabibuga to Kwiop. These are the only transfers of plumes noted as having passed from the southern area to settlements on the north bank of the Jimi. Aside from plumes of P. raggiana all these transfers have been to the Central area. A few raggiana plumes have also been recorded as transferred to the Northern area.

Plumes of all species listed in Appendix 3 have been transferred from elsewhere in the study area to this area, except Charmosyna and Epimachus meyeri. It is of note, however, that no transfers of plumes have been documented in case histories as moving from the Eastern to the Southern area. Informants in Tabibuga did assert that such transfers

do take place. For instance, P. minor is sent to Bubgile in exchange for Astrapia plumes. Such transfers, however, appear to be post-contact developments. While the Eastern area has its links with the people of the Wahgi primarily through Nondugl to the south, and Karap towards the headwaters of the Tsau River, people of the Southern area have always maintained these links with Banz. Those species not easily obtained in the forests of the Southern region, notably the long-tailed Paradisaeidae and certain of the lower altitude species, are mostly obtained from the Northern and Central areas, which are not only closer, but where many of the species involved are relatively common. Since pacification trade links have been opened up with the Simbai Valley, from where Psittrichas feathers are occasionally obtained. According to informants' statements, a considerable quantity of plumes entering this area have come from the lower Jimi. Timbunki, Tsendiap, Tsalip, and Kandambiamp appear to be a source of P. minor and Psittrichas plumes, as well as some high altitude species.

Tabibuga appears to be a major trade centre for plumes, particularly after Christmas, when people of the Northern area are willing to part with their plumes. However, much of this trade does not appear to be mediated by the people of the Southern area. Rather, people of the Northern area and the Simbai come to Tabibuga and sell or barter their plumes direct to visitors from the Wahgi and Chimbu areas. Plumes were said to be sold in the market, held weekly at the Tabibuga Patrol Post, until quite recently. According to informants, this seldom occurs now, and I saw no evidence of the sale of plumes at the one market I attended.

Contemporary patterns of plume transfer, then, appear to be basically the same as pre-contact patterns. The major direction of flow is from the Northern and Central areas, with some counter movement in return,

primarily of Paradisaea raggiana. From this area, plumes move south to the Wahgi. Alongside this flow of plumes according to traditional patterns, new links have been established with people of the Simbai and Eastern area.

9.3.3 Central Area

In pre-contact times, Paradisaea minor was the most important plume species contributed to the overall flow of plumes in the Jimi by the Central area. This is still the case, and most minor plumes are transferred, not only within the Central area in a general upstream movement, but also to the Eastern and Southern areas. Many of these minor plumes have come from the Northern area, and a few also from the Simbai.

Astrapia plumes enter the Central area from the Eastern, Southern, and Northern areas. Most of these have come from the Eastern area, although a number also appear to be taken in the forests in the Koriom area. The Northern area is also a source of many Astrapia plumes, although most are obtained from settlements with whom the people of the Central area did not maintain relations prior to contact. Many of the Astrapia plumes from the Southern area have probably originated in the Northern area, although some, no doubt, have entered the Northern area by trade or in bride-price from the Central area before being returned through similar transactions.

Nearly all Psittrichas plumes have entered this area from the Northern area, while a small proportion have been obtained at Bank in the Simbai, or from traders from Bank. Several Psittrichas plumes have come from the Eastern and Southern areas. It is most likely that these plumes came originally from the Simbai via the Northern or Central areas.

In most recorded cases, Paradisaea raggiana plumes have been obtained from the Eastern and Southern areas, whilst the remainder have been obtained from Minj and Banz.

All other plume species have come from the Northern area, and are passed on to both the Eastern and Southern areas. As in other areas, most Charmosyna and Tanysiptera skins have been obtained in the Port Moresby area, although some enter the Central area from the three other trade areas of the study region.

As seems to have been the case in pre-contact times, the people of the Central area continue to act as intermediaries in the upriver flow of plumes. Plumes obtained from the Northern area are transferred on to the Eastern and Southern areas. The only plumes that appear to be passed on to the Northern area in any quantity are of Paradisaea raggiana. Plumes of Astrapia entering from the Eastern and Southern areas do not appear to be passed on to the Northern area to any great extent, but are cycled back through the Southern and Eastern areas. Some also are transferred on to the Wahgi.

9.3.4 Northern Area

In section 4 it was noted that Astrapia and Paradisaea minor are fairly common in much of this area. Plumes of these species are transferred within the area (predominantly in an upstream direction), and to the Central area. Beyond Togban, the flow of Astrapia plumes slackens off in the face of the volume of these plumes originating in the Eastern area. Some Astrapia plumes are also transferred to the Southern area.

Considerable quantities of Paradisaea minor are shot in the Northern area, while other plumes of this species are obtained from the Simbai. These, along with other locally occuring species, notably Epimachus, Lophorina, and Pteridophora are passed on to the Central and Southern areas, and occasionally the Eastern area. Some plumes of these species are obtained from groups lower down the Jimi.

It is through the Northern area that the great majority of Psittrichas plumes find their way into the Jimi. Certain other plumes, especially of Paradisaea minor and other lowland species such as Aceros and Domicella also enter the Jimi from this area.

As in pre-contact times, then, the Northern area, by virtue of its extensive ties with Simbai Valley Maring, is a major point of entry of lower altitude bird plumes into the Jimi. It is also an important source area for higher altitude species. According to informants, some of the plumes of low altitude birds are originally obtained by Simbai populations from the Ramu lowlands in the vicinity of Aiome and the Asai River. Some plumes also come to the Simbai from the Kaironk Valley.

9.3.5 Centres of Supply and Consumption

Most of the less valued bird species occur in the territories of all clan clusters. Those which are of somewhat restricted distribution, such as Diphyllodes magnificus or Paradisaea rudolphi are, however, seldom traded. Indeed, many informants remarked that most men do not preserve the skins or ornamental plumes of Diphyllodes, nor of more common Paradisaeidae such as the Parotia. Paradisaea rudolphi is rare, and largely unknown beyond its range of occurence. Thus, not only are very few plumed specimens shot, but there is little, if any demand for its plumes in areas lacking access to wild populations. Similarly, lack of demand mitigates the trading of Diphyllodes, Parotia and Cincinncurus plumes.

A high cultural value is placed on bird plumes throughout the study area. It seems, however, that there is a greater demand for plumes, especially for Psittrichas, Astrapia, and Paradisaea minor among the Narak and Kandawo speakers. In part, this higher demand may be because plumes are included in bride-price payments. Men, therefore wish not only to possess plumes for self-decoration,

but also for contribution to bride-price payments.

As in pre-contact times, most valued items other than plumes, enter the Jimi through the Eastern and Southern areas. While returning contract labourers bring money to all settlements, the Eastern and Southern areas are again the most important sources of money. Both these areas are relatively close to markets for coffee (at Tabibuga and Kol), and both are now linked to Banz by vehicular roads. Settlements in these areas and those of the Central area closest to Tabibuga grow more coffee than most other settlements of the study area, and hence average cash incomes are no doubt higher.

The demand for plumes seems unlimited. At any rate, it seems that for some time to come the demand for plumes will exceed the supply. Moreover, as perishable items, easily discoloured or damaged, there is a continual need for re-supply of plumes. A man loses plumes not only through their damage, but also through contributing them to a bride-price payment; by giving them to kinsmen as a token of his good faith and acceptance of future obligations; and by trade or sale. It is true that a man also receives plumes by the same means, but not necessarily at such times as to maintain the quantity or quality of plumes that he may desire. However, even when the quantity of plumes desired is approached, a better quality of plumes may be desired. These factors appear to operate within the study area. Plume collections viewed from Kwiop upstream were generally composed of greater numbers of plumes of a higher quality than in settlements downstream of Kwiop. In these downstream settlements the demand for more and better plumes is certainly present. Informants explain their inability to acquire better plume collections by saying that they cannot afford to buy, or acquire plumes by exchange.

People of the Eastern and Southern areas, and some from the Central area, commanding larger amounts of cash

and resources of traditionally valued items, by virtue of their advantageous proximity and connections with the Wahgi Valley groups also possessing such wealth, can better afford the cash, wealth items and other valued articles to acquire plumes. These settlements are also intermediaries in the transfer of plumes up to the Wahgi where a higher return in cash or wealth items is often received.

Plumes, then, in the Jimi tend to flow in the directions of greatest demand. Where demand is higher, returns for plumes tend to be somewhat higher. This trend is not so noticeable in the Jimi itself, but it appears that, for instance Paradisaea minor are sold for slightly higher prices in the Eastern, Central and Southern areas than they are in the Northern area. Plumes of minor can be obtained in return for even less cash in the Simbai.[1] While minor plumes are seldom exchanged for steel axes within the Jimi these days, such exchanges still take place between Jimi and Simbai groups.

In section 9.2.1.6 it was suggested that one reason for the falling off of the transfer of Astrapia plumes from Togban downstream is that there is less demand for quantity since these plumes are seldom used in bride-prices, and therefore men do not seek to have supplies of the plumes in addition to their requirement for self-decoration. However, even though a greater demand for plumes does exist in these downstream settlements (and even though this demand may be less than further upstream), lesser resources of cash and wealth items and other valuables may mean that fewer individuals can meet the value of plumes set by their vendors. Proximity to areas of supply of Astrapia plumes in the Northern area may also explain the changing direction of the flow of Astrapia plumes.

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1. Of the few records I have of the purchase of plumes in the Kaironk, the amounts of cash are even less: e.g. a Tabibuga man buying Epimachus meyeri plumes for $2.

Informants stated that plume collections are very much larger and more varied in the present than they were before pacification. Their explanation for their better collections is that they can now travel as far as they wish in search of plumes. It has already been noted that a number of settlements have extended their range to settlements with whom few if any contacts were previously maintained. Nonetheless, a strong tendency is still evident of avoidance of trade with formerly hostile groups. Between many groups taboos on sleeping in one another's houses, cooking over the same fire, or eating food grown on one another's land still operate although these taboos are not adhered to quite so strictly among younger people.

These extensions of range have occurred not only in the Jimi, but into the Simbai and Wahgi as well. It has already been noted that some men of the Eastern area travel as far as Goroka in the Eastern Highlands. In addition, many Wahgi Valley people now come to the Jimi on trading expeditions, obtaining cassowaries and plumes for money, kina, and pigs. Occasionally these traders also sell plumes, usually of Charmosyna papou. Parties of up to ten Chimbu traders also enter the Jimi to buy plumes and cassowaries. Their visits seem to be not uncommon in the Eastern, Central and Southern areas of the study area, although they seem to penetrate less often to the Northern area. The last remembered visit of Chimbu traders to Bokapai occurred about three years ago. On the whole, such visiting traders are welcome, especially by the people of the Northern area who consider themselves to be in rather a backwater, and are pleased with the money Chimbu traders bring. In the June 1970 meeting of the Jimi Local Government Council, however (Minutes, L.G.C.), a councillor reported complaints about visiting Kerowagis and Wahgi plume traders who depleted local food supplies without due reciprocity and made the Jimis feel "ashamed". The nature of this shame is not clear from the Council records, but it may

be that an overbearing attitude, which some Chimbu may adopt towards people deemed to lack their own level of sophistication, may contribute to this feeling of shame.

The amount of plumes leaving the Jimi for the Wahgi and Chimbu areas is not known, but the indications from informants' accounts are that it is substantial. The Jimi, then, is an important source area of plumes for the major Highland valleys. Coupled with this drain upon its local resources, demand for plumes within the Jimi exceeds the available supply. Moreover, some of the species in demand, such as Psittrichas and Domicella are either rare or absent from the study area. These and other plumes are imported mostly from the Simbai or coastal areas.

It can be seen then, that while plumes are transferred both north and south and east and west within the study area, the predominant direction of flow is towards the south. The following section examines the mediums by which the transfer of plumes are effected, and the items of exchange transferred in return for plumes.

9.4 Mediums of Transfer

Parties to a transaction fall into one of three categories: kinsmen; formal trade-partners; and informal, non-permanent trading relations. Plumes are transferred within each of these categories.

Brown (1970:99) has described a transaction as "the transmission of any action, object or statement, friendly or hostile, between individuals or groups...A transactional sequence can be reciprocal, equivalent, unequal, continuous, periodic, intermittent, progressive, or regressive." She goes on to define barter, trade or commerce as "a single transaction made and completed with the giving and receiving of goods, services or money. The participants have no continuing relationship with one another." This definition does not

satisfactorily cover the nature of trade effected through formal, enduring links of trade-partners.

Hughes (1971:foll.350) has listed the characteristics distinguishing trade from prestations. This is reproduced below in Table 12.

Table 12
Characteristics Distinguishing Trade from Prestations

Trade	Prestations
Goods always differ.	Goods often the same.
Goods always the product of specialized resources and/or labour.	Goods sometimes not the product of specialized resources and/or labour; usually not the specialized product of givers or receivers.
Return 'gift' usually immediate.	Return gift usually delayed.
Transaction often between non-relatives.	Transaction nearly always between relatives.
Transaction usually between individuals independent of any group exchange.	Transaction usually between individuals but usually as part of a group exchange, usually initiated by a leader and sometimes channelled through him.
Transfer itself rarely involves prestige or status.	Transfer itself always involves prestige and status.
Transfer usually private and unceremonial.	Transfer nearly always public and ceremonial.
Magic in support of a successful transaction rarely used.	Magic to ensure a successful outcome and a return of wealth often used.
Traders usually stress material benefit more than socio-political benefit.	Giver often stresses socio-political benefit more than material benefit.

Reference will be made to a number of these characteristics in the following discussion. It must be noted that Hughes (1971:359) regards these characteristics as defining the poles of a continuum. Not every transaction can therefore be expected to conform to one or other of the two forms of transactions dichotomized.

9.4.1 Individuals Involved in Transactions

9.4.1.1 Bride-price

The greatest volume of plumes incorporated in any single transaction seems invariably to be in exchange for women in the form of bride-price payments. Subsequent to such payments, the bride's kinsmen make a reciprocal payment, including plumes, to the groom's kinsmen. Cook (1969:106fn.) has indicated that among the Manga this payment may amount to 40-50% of the original bride-price, the percentage increasing further upriver. Such transactions are not, in fact, effected through individuals, but by and on behalf of groups. Bride-price payments bear the closest resemblance to the characteristics of prestations listed by Hughes of all transactions involving plumes. While the goods exchanged are not the same, items offered in exchange for women are not necessarily of specialized resources of the bride-price givers. Thus, for instance, Psittrichas plumes incorporated in a Jimi bride-price are not resources over which bride-price givers exercise specialized or localized means of exploitation. Similarly, most local populations including Paradisaea minor plumes in bride-price do have access, albeit unequal, to resources of wild birds. That is, Paradisaea plumes are not the specialized product of the givers or receivers of a bride-price. Astrapia, being rather more localized in its occurence, is to some degree a specialized product, although by virtue of bride-price payments, as well as other forms of transactions, plumes of Astrapia as well as other species, are circulated throughout that part of the

study area where plumes are included in bride-price payments.

Bride-price payments are generally delayed until a couple have produced at least two living children (Cook, 1969:106). While the transaction may not be between relatives, the transaction does initiate new kinship relationships.

A husband may contribute up to 50% of the total bride-price payment. Members of his own subclan contributing much of the rest (Cook, 1969:106). Contributors to a man's bride-price often receive recompense distributed from reciprocal payments from the bride's kinsmen or from bride-price payments paid to the husband's subclan.

Plumes most commonly used in bride-price payments are those of Astrapia. Paradisaea raggiana, P. minor, and Epimachus are employed to lesser degrees.

Plumes are also transferred in connection with marriages as bridal decorations, when the woman moves to her husband's settlement. Lophorina, Charmosyna, and Tanysiptera are commonly employed in such decorations.

9.4.1.2 Kinsmen

Brown (1970:110) has pointed out for the Chimbu that attendant upon the payment of bride-price "there is a continuing transactional relationship between affines and their offspring, and the continued intergroup exchanges between husband's and wife's subclans and clans make marriage the beginning of a transactional relationship between persons and groups, not a completed trade". similarly, in the study area minor prestations of plumes of most of the more common and more valued species are made between affines.

Gifts of plumes are also made to agnates. Returning indentured labourers often make small gifts of Domicella, Charmosyna, and Tanysiptera skins to fathers and brothers.

Such gifts, however, seldom involve the areal transfer of plumes, since agnatic kin are generally resident in the same settlement.

The mother's brother-sister's son relationship is an important relationship in terms of mutual exchanges of goods. Through such kinsmen a man may acquire plumes of species not locally available, or to which he has no access himself. On the death of the mother's brother the exchange relationship is often maintained with his son. Given the frequency of intermarriage between different clan clusters, the exchange relationship often operates between areas with access to different plume resources, such as the Simbai and the Northern area of the study area.

Where a man has no mother's brothers or sister's sons, or where such kin do not discharge their exchange obligations, a man is not entirely cut off from permanent relationships that can be manipulated for the purposes of acquiring plumes or other valued items. The trade-partner relationship can be exploited in addition to or as a substitute for the mother's brother-sister's son relationship.

9.4.1.3 Trade-partners

Many men retain ties with individuals for the express purpose of trade. Usually, but not always, these trade-partners belong to different clan clusters.

Such ties may be built up over a period of time. A man who, on a number of occasions, has engaged in trade with the same individual may suggest that they become trade-partners. One Manga man who in his youth often visited Bubgile for courting parties received hospitality from an older Kamam man. In recognition of this hospitality, the Manga man presented his host with a small gift of plumes. Since then, the two men have established formal ties as trade-partners. Again, a man may inherit such a relationship from his father.

Trade-partnerships are essentially maintained for their utility in securing items of value. By virtue of such ties a man is assured of hospitality when visiting the settlement of his partner. Frequently, the exchange of goods effected through trade-partners is not immediate. Men of the Simbai Valley, for instance, periodically visit trade-partners of the Northern area, bringing plumes of Psittrichas, Astrapia, or Paradisaea minor, and to a lesser extent, other plumes. These they leave with their Jimi trade-partners, specifying the goods they wish in return - usually pigs, kina, or money. At a later date, the Jimi partners exchange these plumes, sometimes having used them once or twice for decorations. Often these exchanges are made with other trade-partners upstream or cross-Jimi. Simbai trade-partners may then return to the Jimi to collect the goods they asked for in return, or Jimi partners may carry the goods into the Simbai, perhaps taking extra pigs, kina, or money, and asking for more plumes in return. Alternatively, exchanges between trade-partners may be effected immediately, if both parties possess the items asked for in exchange. It seems not unreasonable to describe such trade as commerce. Even though the completion of the transaction may be delayed, the initiator of each transaction can specify what he wishes to receive in return. That is, he sets his own price. There is some moral pressure to meet this price set. Moreover, it is in a man's own interests to honour his side of the transaction. If his trade-partner is not satisfied with the return he receives there is some indication that he might let the relationship lapse. Thus access to resources not easily obtained locally, may be deprived to those not honouring the demands placed upon them by their trade-partners.

Species most commonly transferred through the trade-partner medium are Psittrichas, Astrapia, Lophorina, Paradisaea raggiana, and P. minor. The general flow of

these plumes has been examined in section 9.2. In exchange for these plumes, pigs and money are the predominant items. Other items exchanged are plumes, kina, and steel tools. In all cases recorded for which pigs were the exchange item, pigs have been transferred downstream and from the Northern area to the Simbai. The same direction of flow was the case for the majority of transactions involving money.

9.4.1.4 Informal trading relations

The transfer of plumes through informal trading relations most closely corresponds the Brown's and Hughes' definitions of trade or barter.

Informal trading relations do not endure after the conclusion of a transaction which is effected immediately.

Of transactions for which full information is available concerning the parties to the transaction and the exchange items involved, 60% have involved trade between unrelated persons. The remaining 40% of transactions have been effected through kin, bride-price payments or bridal decorations, and trade-partners. Of these transactions effected through formal trading or exchange relations, 32% have involved trade-partners, 42% have involved kin, and 26% have been transferred in bride-price payments or bridal decorations.

54% of the transitory trade transactions have been conducted in Port Moresby, Rabaul, Lae, and other centres beyond the normal range of Jimi people. Since the indentured labourer from the Jimi can command few items of value other than money when in these centres, and since other items are unlikely to be acceptable to many traders, he can only acquire plumes with money.

If transactions made beyond the normal range of Jimi people are discounted, a different proportion of the mediums of transfer of plumes is revealed. The labourer in a strange place is, by and large, constrained by circumstance to transact for plumes with unrelated people who wish only

money in return. By disregarding transfers in such places we are left with circumstances in which the parties to a transaction not only have a choice in the exchange items involved, but a choice of the relationships through which the exchange is mediated. Proportions for the different mediums of transfer, then, are as follows.

Transfer through trade partners:		17.6%
Transfer through kin	:	23.1%
Transfer through bride-price and bridal decorations	:	13.9%
Transfer through informal, transitory trade links	:	45.4%

Transactions through informal trade links then, still outnumber transactions through any single other medium. Somewhat more than half transactions through transitory links involved money, the rest involving pigs, and occasionally steel tools, other plumes, shells, and in one instance coffee seedlings. Thus, within the Jimi where an individual has access to items of wealth and value other than money which can be exchanged for plumes, or where an individual is willing to receive such goods in exchange for plumes he wishes to sell, since he can subsequently use such items in further exchanges, then money will not always be offered or demanded.

9.4.2 Exchange Items for Plumes

Items exchanged for plumes have been mentioned in previous sections, and only a few general remarks need be made here.

It has been shown in sections 9.2 and 9.3 that the predominant flow of plumes moves upstream along the north bank of the Jimi entering the Wahgi in the region of Nondugl, and from the area bounded by Bokapai and Kelunga to the Tabibuga area. From here plumes are passed on to Banz and Minj. Some plumes enter the study area from the Wahgi, while considerable numbers are obtained from the Simbai.

Against this flow move pigs, kina, and money.

Of the 73 documented transactions involving pigs in exchange for plumes, only four of these pigs have been transferred upstream or cross-Jimi in the direction of the Wahgi. All other pigs have moved downstream along the north bank of the Jimi, cross-Jimi from the Kwibun-Tabibuga area, and into the Simbai.

Within the Narak and Kandawo areas available data suggests that women tend to be sent in marriage to populations in the upper Jimi and on the north slopes of the Sepik-Wahgi Divide, close to the crest. This trend may result from a desire of wife-receiving groups to establish ties with groups lower down the Jimi from whom, in future transactions, plumes may be obtained. Lowman-Vayda (1971:326) has noted for the Maring that some men offer their daughters in marriage to a specific clan noted for its ability to obtain plumes. A motive behind the marriage of women to the south may also be a desire on the part of the wife-givers to establish links with groups commanding greater pig and kina resources in the south. Desire to obtain certain plume species, such as Astrapia and Paradisaea raggiana may also be a motive. However, I have no data concerning motives for initiating marriage, and the above hypothesis can only remain speculative.

As with pigs, money and shells tends to flow from south to north along the Jimi, and eventually into the Simbai.

10. CONCLUSION

10.1 Trade and Ecological Zones

In an examination of the extra-territorial relations of the Tsembaga Maring of the Simbai Valley, Rappaport (1968:100) notes that "it is no doubt relevant that the trade routes generally run across the grain of the land. Commodities that are not provided in a group's own territory, or are provided in only insufficient quantities, are obtained from people living across the river or over the ridge in the next valley". He goes on to say that "it is not surprising, then, that friendly relations generally prevail between groups separated by mountain ridge or river. Their relationship is mutually advantageous in that they supply each other with needed or desired commodities, and they are noncompetitive because their lands are not of use to each other.

"Conversely, it is not surprising that relationships between groups living side by side on the same valley wall are frequently antagonistic. Such adjacent groups do not depend upon each other for commodities. They are not bound together by the material exchanges that characterise the relationships of people whose territories are separated by mountain ridge or river."

In other words, Rappaport sees thedominant directions of trade as crossing natural physiographic barriers which, he implies, ipso facto separate zones with some degree of ecological difference.

Hughes (1971:360-361) echoes this thesis when concluding his examination of pre-contact trade in the central Highlands. His study, he notes, "has shown that the linkages that made up the basic network as well as the flows of goods which passed through them not only extend across physiographic, ecological and cultural divisions but were most vigorous there, for that was where the potential for trade was greatest...Resource differences made it

possible for trade to develop. Only areally specialized products were traded."

Hughes' statement is applicable to the nature of trading relations, both contemporary and prior to contact, maintained by people of the study area with other regions. As has been demonstrated, extensive trading relationships are maintained with people to the north of the Bismark Crest, south of the Sepik-Wahgi Divide, and west of the Tsau River. While the flow of plumes was not equal in volume in both directions along these major lines of flow, other items, notably pigs, shells, and nowadays money, flow counter to the predominant directions of plume movement.

The relatively large expanses of level land in the Wahgi with swampy conditions near the river itself, and the lack of extensive areas of forest within much of the valley serve to differentiate the Wahgi from the ecological conditions of the Jimi. Those parts of the Simbai Valley with which Jimi Valley people maintain trade links, however, exhibit similar ecological conditions to those present in the Jimi. However, Simbai groups themselves maintain trade links with the ecologically dis-similar Ramu lowlands. Access to this ecological zone is limited for most groups of the study area except the Kaman of Bubgile. The Simbai, then, mediates in the flow of goods from the Ramu lowlands to the mid-altitude Jimi.

The area in which the present study was conducted constitutes one ecological and resource area in Hughes' terms (1971:134ff.). Information presented in section 2 of this study describes some of the ecological conditions operating throughout the study area. Nevertheless, within this single ecological zone, a considerable volume of trade in plumes and other valued items occurs, not across the grain of the country, but along lines of least physiographic and cultural difference; that is, parallel to the Jimi River and the Bismark Crest. In accordance with Hughes' and

Rappaport's theses one might expect the trade links of, for instance, the Manga to be predominantly with Maring groups across the Bismark Crest, and with the people of the Tsau-Jimi divide. While such trade with Simbai Valley groups has been occuring to a relatively minor extent since pacification, and trade with people of the Tsau-Jimi divide has always been of importance, the predominant trading links of the Manga were, and still are, with groups situated on the same valley wall. It is true, of course, that groups with which the Manga traded did maintain relations with the Simbai Valley and the Wahgi, and that therefore the Manga did have access, by way of intermediaries, with the specialized and localized resources which people of the Simbai and Wahgi could provide. The Manga, and other groups with similar trade relations, have not, then, followed the principle of trading along lines of greatest physiographic, ecological, and cultural differences, (that is, across the grain of the country), but have developed their major trade links along lines of least resistance, and within a single ecological zone. At least, such is the interpretation of their trade in terms of the hypotheses presented above.

The problem, however, can be thought of as one of scale. The Jimi, in contrast to, say, the Wahgi, can be viewed as a single ecological zone. However, if one's scale of reference is the Jimi itself, rather than a broader region, ecological differences can be identified. Hughes (1971:134ff.) points out a number of regional differences. In section 2.5 it was shown that the three major ecological divisons, the boundaries of which though perhaps not determined by human activity are nonetheless the product of human activity, run in broad belts parallel to the Jimi River and the Bismark Crest. In section 4 it was demonstrated that the distribution of valued bird species within these ecological zones is not always even. A number of the more important and valued plume-bearing

species are localized in their occurence within the study area.

Ecological differences and areas of resource differences, then, do occur within the study area. The numerous side valleys in the Jimi also produce a rugged topography, and looked at in microcosm, the trade routes along the Jimi are crossing physiographic boundaries that in places tax the energy of even those accustomed to the terrain. Yet, the whole study area is characterized by such terrain, and therefore these topographic features are of little significance in local resource differences.

Perhaps an explanation for the tendency of goods to be traded along lines of least resistance in the study area is that routes have developed so as to minimize the crossing of obstacles in the form of large rivers and high, rugged mountain ranges. The fact that each settlement had some contribution to make to the overall flow of goods[1] may have been an added factor leading to the development of trade routes incorporating each settlement and crossing barriers at the fewest possible points.

Plumes, then, might have travelled south to the Wahgi from the Gunts region of the Simbai through the Kubgile-Kosap area, and on to the Kol region, entering the Wahgi via Nondugl.

Practically all trade with the Simbai, however, is conducted by settlements between, and including Tsuwenkai and Kwima. From informants' accounts there are indications that the flow of plumes in the Simbai tends to be upstream, rather than direct to Jimi groups from each settlement. That is, the number of points at which the Bismark Crest must be crossed in the trade has been minimized. Upstream from Togban, subsiduary valleys and ridges must be crossed before gaining access to the main slopes of the Bismark Crest. From Kwima downstream, access to the Crest is made relatively easy by spurs extending from the main range down to the Jimi. The number of trade links with the Simbai,

1. Nearly every settlement in the study area adds, for instance, Paradisaea minor plumes to the flow.

then, have not only been minimized, but they occur along topographic features posing least difficulties to the trader. Much the same processes seem to be operating in the flow of plumes from the study area to the Wahgi, such that the predominant lines of trade follow the Tsau-Jimi divide up through Karap to Banz, and the Walne River up through Kol to Nondugl.

Because within the study area trade routes follow lines of least topographic and ecological difference, Rappaport's assertion that groups adjacent to one another in the same valley are not dependent upon one another for commodities is not applicable. It is true that generally hostile groups adjacent to one another were not interdependent, but ties of trade were maintained with friendly groups in the valley. These could be reached by moving hastily and stealthily through the forested zones of hostile groups, or by crossing the Jimi to the territory of friendly groups to circumnavigate enemy territory.

10.2 Plumes and Bisnis

Many informants describe the sale of plumes as p.e. bisnis bilong mipela (our business, economic enterprise). But their concept of bisnis does not appear to necessarily involve the production or extraction of items specifically for cash sale. The trade in plumes, some say, was also the p.e. bisnis bilong tumbuna (our ancestor's business). Pigs and coffee are also bisnis. Traditional trading activities, then, are regarded as belonging to the category of activities they describe as bisnis, along with post contact developments, such as the cash cropping of coffee.

In trading activities between kin, trade-partners, and unrelated persons, as opposed to prestations, money enters into transactions involving plumes in little more than half the number of transactions recorded. Other transactions involve traditionally valued items which are

still of significance in the contemporary economy. At the present time, money appears to be an addition to the category of traditional wealth items, rather than a substitute for it. While there is a great desire for money, and while the people are by no means satisfied with their present means of earning money, it is not essential to subsistence.

There are no traditional markets in the Jimi. A weekly market is held at the Tabibuga Patrol Post now, and plumes are occasionally sold there. It appears that the use of Tabibuga as a market centre for plumes increases after Christmas when many men of the Northern area travel to the Patrol Post to sell or barter plumes to visitors from the Wahgi. However, there appears to be no exploitation of plume-bearing birds for a market. Exploitation is, rather, geared to the wants of the individual. When he wants plumes for decorations he shoots birds in the bush, or obtains them by gift or trade from others. When he wants money to pay his council tax, to buy some item for which he does not have enough cash in reserve, or to pay a debt or meet an obligation to a kinsman he may sell his plumes. Or if he wants to acquire a pig or more kina he may trade plumes for these.

The exploitation of birds and the trade in their plumes, then, is not organized towards markets, and demands operating elsewhere, but rather to the demands of the individual.

Given the apparently great demand for plumes in the Wahgi and Chimbu regions there is little doubt that traders might be able to organize their exploitation and trade of plumes into a profitable business enterprise. For the present, at any rate, those seeking to earn money prefer to do so through the establishment of coffee groves, running trade-stores, and recently, by establishing piggeries where the services of stud boars are hired out. At the moment then, those with entrepreneurial aspirations are not seeking to engage in exploitative enterprises. It seems likely that

for a long time to come the Jimi will remain economically depressed. Its somewhat fringe location in relation to the major Highland centres, coupled with the very rugged terrain has made the development of communications difficult. Should mineral resources be discovered in the Jimi that can be economically exploited, it is doubtful that the local inhabitants will derive much in the way of lasting benefits. Certainly the locals would have little control over the means and regulation of exploitation.

The Jimi, however, is rich in birds valued locally and elsewhere for their plumes. These are a resource over which the people do exercise exclusive rights. There appears to be very little hunting of birds by non-local people, and certainly the informal Council rules appear to be sufficient to exercise control of such poaching, even if these rules are not recognized by law. There are no professional traders in the Jimi, and no professional hunters.[1] There seems little doubt that the plume trade could be organized on professional, economic lines, with traders buying plumes in the Simbai and Jimi, and transporting them to the Wahgi and Chimbu areas where they could be sold.[2] The profits from these sales might well be enough to cover costs incured in the Simbai and Jimi, in the form of purchase of plumes, hire of transport from Tabibuga to Banz and beyond, and, perhaps payment of hunters. Such traders would of course, have to contend with the law which forbids the sale of plumes of Birds of Paradise. Few, if any, Jimi people are aware of this law at present.

In sections 4 and 5.6 it was stated that under present rates of exploitation most of the more highly valued plume-bearing birds do not appear to be declining in

1. There is at least one man who works for a gun-owner as his hunter. I am unclear on the precise relationship involved, but he does not appear to work for a wage.
2. Trade in live cassowaries could be organized along similar lines to the advantage of Jimi people.

numbers. For the organization of plume-trade on profitable economic lines, it would be essential that the rate of exploitation does not exceed the rate of development of adult, plumed birds. These rates appear to be nearing equilibrium in the present, although in the absence of further data on the birds' ecology, this statement can only be tentative. Should professional traders emerge, however, it is quite likely that their activities would stimulate intensification of exploitation of the birds with adverse effects upon the bird populations, and hence the trade in their plumes, which may never be able to be rectified. The problem of conservation of Birds of Paradise in the Jimi is examined in the next section.

10.3 Conservation of Birds of Paradise.

In a recent review of the problems involved in the conservation of Birds of Paradise Schultze-Westrum (1969) lists five factors which he considers have led to an increase in hunting of Birds of Paradise. Briefly, these factors are:

1. While formerly display trees were owned by individuals or clans, where mature male birds were selectively shot, "the rapidly increasing breakdown of traditional life, the loss of biological knowledge and of a close relationship to nature...[have] led to a widespread abandonment of this method which formerly guaranteed the preservation of the females and the management of the males".
2. With pacification and Governmental activity the individual can now roam at will, with no risk to his safety. Hunting, then, has been extended into areas where it was formerly unsafe to go.
3. Labourers and other workers, recruited from different linguistic and cultural areas to the areas in which they work "usually have few if any traditional ties with the new environment and they do not exercise particular restraint in the shooting of game".

4. An increase in the number of shotguns owned. Shotguns make the killing of birds, in any part of their habitat, much more easy.

5. The increase in demand for cash has provided an incentive to hunt birds for the sale of their plumes. On this point Schultze-Westrum seems mainly concerned with the relatively infrequent and illegal sale of plumes to Europeans. He feels that with increasing tourism, incentives to make such sales may increase.

Schultze-Westrum has commented on the problems of conservation for the country as a whole. Inevitably, then, his remarks have had to be somewhat general. The points summarized above, however, provide a useful framework for examining problems of conservation of Birds of Paradise in the Jimi.

It would not be true to say that there is a rapid increase in the breakdown of traditional life among people of the study area. It is true that many younger men no longer know the various rituals associated with, say, the pig feast cycle (Dr. E.A. Cook, personal communication). Yet the social organization of Jimi people seems still strongly embedded in tradition. Informants, both old and young, still possess a wealth of biological knowledge about their environment, contrary to Schultze-Westrum's statement. As has been demonstrated in section 6, traditional rights and restrictions continue to operate. Indeed, some informants suggested that hunting activities are even more circumscribed by restrictions, or at least that infringment of rights are more assiduously prosecuted now than previously. Similarly, traditionally adopted voluntary restraints on the number of birds shot still operate. The Jimi Local Government Council has adopted traditional territorial and hunting rights and restrictions, and lends the sanction of the local kot to ensure compliance with these rights and restrictions. The Council has also

instituted a lo forbidding the shooting of females of Paradisaea minor. It has been noted in section 5.6.3 that Council los have been deliberately employed to regulate the rate of exploitation of valued resources, and to ensure that all individuals and groups retain the rights of exploitation of valued resources that they enjoyed in the past. It was noted in section 6 that these Council los have, for the most part, been adhered to. Despite increased freedom of movement, restrictions still deter a man, whether he is from the Jimi or a Government or mission worker recruited elsewhere, from infringing upon the territorial and hunting rights of local groups.

There can be little doubt that the acquisition of shotguns has led to an increase in the number of Birds of Paradise killed. The majority of birds killed, however, are still taken by traditional means. The Administration Officers currently posted to the Jimi are reluctant to issue any more shotgun licences for fear of accelerating the destruction of wildlife. Future Officers, however, may not share the same objections to the issue of licences, and while many Jimi people are aware of the threat that the indiscriminate use of shotguns poses to bird populations, there will no doubt be those who do not share these reservations. The threat of legal action against those who shoot Birds of Paradise with a gun has not proved a deterent, and, unless policing of the law is more effective, this threat is unlikely to be so in the future.

With pacification and the freedom of movement that followed, trade in bird plumes received impetus. An increase in hunting has followed the increase in trade. Present rates of exploitation do not appear to be in excess of the rate of natural increase of certain of the more valued Paradisaeidae, particularly Astrapia and Paradisaea minor. The value of plumes as a means of earning cash through sales has not been fully realized. As the economy of the Jimi becomes more reliant on cash, two things may follow. Trade in plumes may

become more monetized and professional traders appear, or the people may become oriented to small scale, intensive primary production. These are not mutually exclusive possibilities.

While at present Jimi people exhibit some concern over the future of Birds of Paradise, and have instituted Local Government los aimed at ensuring the preservation of the birds to allow for continued exploitation, the future of the birds is unclear. Increasing population, and a greater reliance upon cash in the future are likely to lead to the clearing of more forest for gardens and cash crops. But such developments need not necessarily lead to the inevitable extinction of Birds of Paradise in the Jimi, especially since the most desirable land for these purposes is in the middle altitudinal ranges. Most of the Paradisaeidae depend on the montane and lowland forests, not all parts of which are suitable to agriculturalists. Paradisaea minor, moreover, exhibits an ability to survive within the zone of human habitation. Should traditional decoration styles still be desired, and hence the birds still be valued, there seems no reason to suppose that currently operating rights and restrictions will necessarily be relaxed in the process of economic development and social change. The development of roads, however, may make it easier for non-locals to poach birds in the Jimi forests undetected. Possible future mining and forestry operations may further disturb the habitat. These are problems over which the people of the study area will be able to exercise only limited controls.

It is difficult to predict the future of Birds of Paradise, and the hunting of them and the trade in their plumes in the Jimi. The above comments are some of the factors which may have some bearing on this future. The present study has shown that the Jimi people exercise controls over the exploitation of Birds of Paradise and

have developed trading links ensuring the supply of plumes of locally restricted birds to those with little or no access to wild populations. The present indications are that while the future of the birds may not be secure, their future will be a matter of concern for the people of the Jimi. As long as existing trade networks are important for the supply of plumes, some measure of local control over the exploitation of resources of the land may persist to regulate and ensure the continued supply of plumes.

APPENDIX 1

Selected Altitudinal Readings in Metres and Feel A.S.L.

Readings in settlements were taken at Government Rest Houses, unless otherwise stated. Readings were taken with a barometric altimeter, calibrated in 50 foot intervals. Metric measurements have been calculated by conversion. The altimeter was set at Mount Hagen airstrip, and re-checked at Koinambe airstrip from a light aircraft altimeter, and at the gazetted altitude of the Tabibuga airstrip. Gross vairations recorded near sea level on the altimeter were up to $\pm$150 feet. Recorded variations in the Jimi were of a lesser order.

	Metres	Feet
Koinambe: at airstrip	914	3,000
Kompiai	1,720	5,650
Tsuwenbai	1,736	5,700
Bokapai	1,729	5,675
Kupeng	1,537	5,050
Kupeng Konmongwai: at ridge crest	1,828+	6,000+
Kwima	1,263	4,150
Togban	1,432	4,700
Togban Anggoma: at ridge crest	1,614	5,300
Kwiop	1,523	5,000
: at ridge crest	1,600	5,250
Koriom	1,509	4,950
Mogine	1,645	5,400
Kelunga	1,600	5,250
Kosap	1,707	5,600
Bubgile	1,676	5,500
Agemba: at approx centre of settlement	1,451	4,750
Tabibuga: at airstrip	1,310	4,300
Jimi River: at Koinambe crossing	518	1,700
: at Kwiop crossing	609	2,000
Nam River: at Kwiop-Koriom crossing	823	2,700
: at Kwiop-Agemba crossing	1,144	3,250
Koriom-Mogine crossing	1,218	4,000
Mogine-Kelunga crossing	1,508	4,950
Range heights: above Tsuwenkai-Bokapai	2,333+	7,600+
: above Kwiop-Agemba	2,073	6,800+
Estimates: Jimi River at Bubgile-Bubulsunga crossing	761	2,500
Bismark Crest at Tsuwenkai Pass	2,042	6,700
at Bubgile Ramu Pass	1,828	6,000
above Tsuwenkai-Bokapai	2,430	8,000
above Kwiop-Koriom	2,140	7,000

APPENDIX 2

Vernacular Terms for Species Exploited for Plumage

Listed below in systematic arrangement are the vernacular terms recorded for the various species noted in Table 4 and the accompanying text in section 4.1 as being exploited for their plumes.

The list records those terms most commonly used by informants when referring to particular species. The majority of terms are "specific" terms. A few are "generic" but are frequently used in reference to a "type species" by informants.

A dash in a column indicates that there is probably no vernacular to a species. A blank space indicates where a vernacular term was not recorded for the species in question, while a question mark preceding a term indicates that the term recorded most probably refers to the relevant species listed.

Species	Maring	Narak	Kandawo
Casuarius ?unappendiculatus Single-wattled Cassowary	rangkɨrangk	rangkɨrangk	rangkɨrank
Casuarius bennetti Dwarf Cassowary	kombele yongge	miya	miya
Henicopernis longicauda Long-tailed Buzzard	tukump	nduka	dua
Harpyopsis novaequineae New Guinea Harpy Eagle	binàn		
Sterna sp. Tern	-	-	-
Ptilinopus superbus Superb Fruit Dove			
Ptilinopus rivoli White-breasted Fruit Dove	nggondɨmamp		
Goura sp. Crowned Pigeon	komben		
Pseudeos fuscata Dusk-orange Lorikeet	kiki	kolip kopɨropo	

Species	Maring	Narak	Kandawo
Trichoglossus haematodus Rainbow Lorikeet	giri	nggrisi	
Domicella hypoinochrous Eastern Black-capped Lory	yindama	renjama	renjama
Charmosyna papou Fairy Lory	nggoli warepo	warepo	warep
Charmosyna pulchella Little Red Lory		menjinomb	
Neopsittachus muschenbroekii Yellow-billed Mountain Lory	pendent	anjiginom ? apa	
Cacatua galerita White Cockatoo	akaka kuyame	keka kurame	keka
Psittrichas fulgidus Vulturine Parrot	yawendo kopil	kabal	kabal
Larius roratus Eclectus Parrot	gimda	gimanda	gulimai
Tyto alba Barn Owl		co	
Collocalia hirundinaceae Mountain Swiftlet	manyanep	sipsip	
Tanysiptera galatea Common Paradise King-fisher	joli toliroi	soliloi	soliloi kwanjil
Aceros plicatus Hornbill	kawiya	kaura	kaura
Pitta erythrogaster Blue-breasted Pitta	golimbeli	golimbali	
Artamus maximus Greater Woodswallow	karkar	kaskas	ngasingas
Manucodia ?chalybatus Green-breasted Manucode			mungdi

Species	Maring	Narak	Kandawo
Epimachus fastosus Black Sickle-billed Bird of Paradise	karanc	tumba	tumba
Epimachus meyeri Brown Sickle-billed Bird of Paradise	karanc	tumba njeng	tumba njeng
Astrapia stephaniae Princess Stephanie's Bird of Paradise	kombam	mego	meg
Parotia carolae Queen Carola's Parotia	kiawoi	kiawoi	kiawoi
?Parotia lawesi Lawe's Six-cured Parotia	kambai	?-	?-
Lophorina superba Superb Bird of Paradise	yenandiok	konggɨrari jolɨla	konggɨrarɨ
Kiphyllodes magnificus Magnificent Bird of Paradise	piengmai	cel	?cel
Cincinnurus regius King Bird of Paradise	cendɨmai	cendɨmai	aikaka
Paradisaea raggiana Raggiana Bird of Paradise	parka	raiyɨ	raiyɨ
Paradisaea minor Lesser Bird of Paradise	yambai	yambalɨ	yambal
Paradisaea rudolphi Blue Bird of Paradise	aweng	goi[1]	goi[1]
Pteridophora alberti King of Saxony Bird of Paradise	nomapunt balɨpan	kisɨpa	kisɨpa
Amblyornis macgregoriae Macgregor's Bowerbird	kombek	kombeko	

1. Apparently known by name only. Most informants ignorant of its actual appearance.

APPENDIX 3

Transfer of Plume Species

Listed below for the ten species most commonly transferred between settlements are the numbers of plumes transferred into and from each settlement where censuses of plumes were undertaken. The following lists are based upon data collected by means of censuses, where the settlements from which plumes had been obtained were recorded, and from collection of a number of case histories. Informants were asked to provide a history of their former plume possessions, listing settlements from where they had obtained plumes, and those to which they had transferred plumes. Some case histories were gathered in settlements where censuses of plumes were not carried out.

Transfer of Charmosyna Papou

Settlement	INCOMING[1] Total[2]	Origin	No.	OUTGOING Total	Destination	No.	No. shot by and retained by present owner[3]
Bubgile	81	Bank	3	1	Togban	1	5
		Koriom	1				
		Megilpol	5				
		Pt. Moresby	72				
Koriom	12	Kompiai	1	1	Bubgile	1	6
		Mt. Hagen	4				
		Pt. Moresby	7				
Kwiop	50	Bokapai	5	-			5
		Kupeng	2				
		Pt. Moresby	39				
		Tabibuga	4				
Togban	11	Bubgile	1	-			3
		Matsomph	1				
		Pt. Moresby	4				
		Rabaul	5				
Kwima	1	Pt. Moresby	1	-			-
Kupeng	12	Korendiu	2	2	Kwiop	2	-
		Pt. Moresby	10				
Kompiai	-			-			-
Bokapai	-			5	Kwiop	5	-
Tsuwenkai	-			-			-
	167			9			19

1. Excluding transfer within settlements.
2. Excluding number shot by and retained by present owners.
3. No shot in Jimi: 19; No shot near Port Moresby: 13.

Transfer of Psittrichas fulgidus.

INCOMING[1]					OUTGOING		
Settlement	Total[2]	Origin	No.	Total	Destination	No.	No. shot by and retained by present owner
Bubgile	26	Bank	13	1	Kwiop	1	3
		Koinambe	2				
		Kompiai	3				
		Kupeng	2				
		Kwiop	3				
		Lae	1				
		Omen	1				
		Pt. Moresby	1				
Koriom	20	Bokapai	3	-			-
		Koinambe	2				
		Kol	1				
		Kompiai	2				
		Kupeng	6				
		Kwiop	1				
		Tabibuga	2				
		Togban	3				
Kwiop	21	Bank	6	5	Banz	1	-
		Bubgile	1		Bubgile	3	-
		Kompiai	3		Koriom	1	
		Kupeng	1				
		Kwima	1				
		Mogine	1				
		Ndega	1				
		Wanku	7				

INCOMING[1]					OUTGOING		
Settlement	Total[2]	Origin	No.	Total	Destination	No.	No. shot by and retained by present owner
Togban	11	Bokapai	1	6	Bubgile	2	2
		Gunts	1		Koriom	4	
		Kandambiamp	1				
		Koinambe	1				
		Kompiai	1				
		Kupeng	6				
Kwima	8	Gai	3	2	Kwibun	1	-
		Nimbra	3		Kwiop	1	
		'Simbai'	1				
		Tebabe	1				
Kupeng	4	Ambiap	1	15	Bubgile	2	-
		Kenmongger	2		Koriom	6	
		Nimbra	1		Kwiop	1	
					Togban	6	
Kompiai	2	'Simbai'	2	6	Koriom	2	
					Kwiop	3	
					Togban	1	
Bokapai	-			4	Koriom	3	-
					Togban	1	
Tsuwenkai	1	'Simbai'	1	1	Bubgile	1	-
	93			40			5

1. 2. See note, Charmasyna papou

Transfer of Tanyspitera galatea

Settlement	INCOMING[1] Total[2]	Origin	No.	OUTGOING Total	Destination	No.	No. shot by and retained by present owner[3]
Bubgile	27	Bank	11	8	Kwiop	8	15
		Pt. Moresby	16				
Koriom	13	Koinambe	1	-			-
		Kwima	2				
		Togban	10				
Kwiop	26	Bokapai	2	-			-
		Bubgile	8				
		'Simbai'	6				
		Tabibuga	10				
Togban	4	Kupeng	2	10	Koriom	10	-
		Rabaul	1				
		Pt. Moresby	1				
Kwima	2	Ambiap	1	2	Koriom	2	-
		Nimbra	1				
Kupeng	33	Koinambe	4	2	Togban	2	
		Pt. Moresby	29				
Kompiai	-			-			-
Bokapai	-			2	Kwiop	2	-
Tsuwenkai	2	'Simbai'	2	-			-
	107			24			15

1. 2. See note, Charmosyna papou
3. No. shot in clan cluster territories: 15. No. shot near Pt. Moresby: 40 (These are in "Incoming" column).

Transfer of Epimachus fastosus

INCOMING[1] Settlement	Total[2]	Origin	No.	OUTGOING Total	Destination	No.	No. shot by and retained by present owner
Bubgile	5	Bank	1	1	Banz	1	-
		Kwima	2				
		Kwiop	2				
Koriom	4	Kupeng	2	-			-
		Kwibun	2				
Kwiop	9	Bank	5	6	Bubgile	2	-
		Karap	1		Kwima	2	
		Kupeng	1		Tabibuga	1	
		Kwima	1		Wahgi Valley	1	
		Ndega	1				
Togban	-			1	Mogine	1	
Kwima	2	Kwiop	2	3	Bubgile	2	1
					Kwiop	1	
Kupeng	1	Kenmongger	1	1	Koriom	1	-
Kompiai	1	Bokapai	1	-			-
Bokapai	-			2	Kompiai	1	-
					Kwibun	1	
Tsuwenkai	-			1	Gunts	1	-
	22			15			1

1.2 See note Charmosyna papou

Transfer of Epimachus meyeri

Settlement	INCOMING[1] Total[2]	Origin	OUTGOING No.	Total	Destination	No.	No. shot and retained by present owner
Bubgile	-			-			3
Kwiop	1	Banz	1	-			-
Togban	1	Pt. Moresby	1	-			-
	2			-			3

1.2. See note, Charmosyna papou

Transfer of Astrapia Stephaniae

Settlement	INCOMING[1] Total[2]	Origin	No.	Total	OUTGOING Destination	No.	No. shot by and retained by present owner
Bubgile	49	Bank	1	13	Kwima	1	14
		Banz	4		Kwiop	11	
		Kerowil	1		Togban	1	
		Kol	5				
		Kosap	7				
		Kwiop	7				
		Lae	5				
		Manz	1				
		Megilpol	1				
		Nondugl	3				
		Olna	8				
		Pt. Moresby	6				
Koriom	13	Bokapai	1	2	Togban	2	10
		Kosap	9				
		Kupeng	3				
Kwiop	62	Bank	2	26	Bubgile	8	-
		Banz	6		Kwima	3	
		Bubgile	11		Tabibuga	15	
		Karap	5				
		Kompiai	1				
		Kupeng	1				
		Magon	12				
		Mogine	10				
		Tabibuga	12				
		Tsuwenkai	1				
		Wanku	1				

Settlement	INCOMING[1] Total[2]	Origin	No.	Total	OUTGOING Destination	No.	No. shot by and retained by present owner
Togban	18	Bank	1	-			5
		Bubgile	1				
		Koriom	2				
		Kupeng	7				
		Matsomph	2				
		Mogine	1				
		Pt. Moresby	3				
		Tsuwenkai	1				
Kwima	11	Bank	1	1	Olna	1	1
		Bokapai	1				
		Bubgile	1				
		Kenmongger	2				
		Kinimbong	1				
		Kwiop	4				
		Nimbra	1				
Kupeng	3	Kenmongger	3	11	Koriom	3	-
					Kwiop	1	
					Togban	7	
Kompiai	-			1	Kwiop	1	-
Bokapai	-			2	Koriom	1	2
					Kwima	1	
Tsuwenkai	-			2	Kwiop	1	-
					Togban	1	
	157			58			32

1.2. See note, Charmosyna papou

Transfer of Lophorina superba

INCOMING[1]					OUTGOING		
Settlement	Total[2]	Origin	No.	Total	Destination	No.	No. shot by and retained by present owner
Bubgile	-			2	Kwiop	2	6
Koriom	6	Ginjinji	2	-			5
		Kupeng	1				
		Kwima	1				
		Togban	1				
		Tsuwenkai	1				
Kwiop	12	Bubgile	2	5	Ndega	2	1
		Kompiai	4		Tabibuga	3	
		Kosap	1				
		Kwima	5				
Togban	1	Tsuwenkai	1	1	Koriom	1	9
Kwima	10	Ambiap	2	6	Koriom	1	-
		Gai	1		Kwiop	5	
		Kompiai	4				
		Tsuwenkai	2				
		'Simbai'	1				
Kupeng	2	Ambiap	1	1	Koriom	1	1
		Tsuwenkai	1				
Kompiai	2	Tsuwenkai	2	9	Kwima	4	-
					Kwiop	4	
					'Lower Jimi'	1	
Bokapai	-			-			

	INCOMING[1]			OUTGOING		
Settlement	Total[2]	Origin	No.	Total	Destination	No.	No. shot by and retained by present owner
Tsuwenkai	-			7	Kompiai	2	3
					Koriom	1	
					Kupeng	1	
					Kwima	2	
					Togban	1	
	33			31			27

1.2. See note, Charmosyna papou

Transfer of Paradisaea raggiana

Settlement	INCOMING[1] Total[2]	Origin	No.	Total	OUTGOING Destination	No.	No. shot by and retained by present owner
Bubgile	1	Kol	1	5	Koriom	5	-
Koriom	11	Banz	4	1	Kwiop	1	-
		Bubgile	5				
		Kosap	2				
Kwiop	18	Karap	6	14	Bank	1	-
		Kol	5		Kompiai	4	
		Koriom	1		Kwima	9	
		Minj	1				
		Tabibuga	5				
Togban	3	Tabibuga	3	-			
Kwima	12	Kosap	1	2	Bank	2	-
		Kwiop	9				
		Tabibuga	1				
		Wanku	1				
Kupeng	-			-			-
Kompiai	4	Kwiop	4	-			-
Bokapai	-			-			-
Tsuwenkai	13	Banz	2	-			-
		Mt. Hagen	1				
		Pt. Moresby	5				
		Wahgi Valley	5				
	62			22			-

1. 2. See note, Charmosyna papou

Transfer of Paradisaea minor

Settlement	INCOMING[1] Total[2]	Origin	No.	Total	OUTGOING Destination	No.	No. shot by and retained by present owner
Bubgile	29	Bank	3	4	Kwiop	1	25
		Koriom	2		Megilpol	3	
		Kwima	4				
		Kwiop	18				
		Togban	2				
Koriom	9	Koinambe	1	2	Bubgile	2	-
		Kol	1				
		Kupeng	4				
		Kwiop	1				
		Togban	2				
Kwiop	16	Bank	3	42	Banz	2	5
		Bubgile	1		Bubgile	18	
		Kompiai	1		Kol	2	
		Kwima	8		Korendiu	4	
		Nimbra	1		Koriom	1	
		Tabibuga	2		Kosap	2	
					Mogine	7	
					Mt. Hagen	2	
					Tabibuga	3	
					Wanku	1	
Togban	6	Koinambe	2	4	Bubgile	2	5
		Kompiai	2		Koriom	2	
		Kupeng	1				
		Madang	1				

Settlement	INCOMING[1] Total[2]	Origin	No.	Total	OUTGOING Destination	No.	No. shot by and retained by present owner
Kwima	10	Ambiap	2	20	Bubgile	4	2
		Kebents	1		Kenmongger	1	
		Mengambant	4		Kol	1	
		Nimbra	2		Korendiu	1	
		Tenggenai	1		Kosap	1	
					Kwibun	1	
					Kwiop	8	
					Mongine	1	
					Tabibuga	2	
Kupeng	4	Bokapai	1	5	Koriom	4	-
		Kenmongger	1		Togban	1	
		Nimbra	2				
Kompiai	7	Bokapai	1	7	Kwiop	1	-
		'Lower Jimi'	4		Tabibuga	4	
		'Simbai'	2		Togban	2	
Bokapai	6	Kandambiamp	2	4	Koinambe	1	3
		'Simbai'	4		Kompiai	1	
					Kupeng	1	
					Kwibun	1	
Tsuwenkai	7	Ganz R.	1	-			-
		'Simbai'	4				
		Simbai P.P.	2				
	94			38			40

1. 2. See note, Charmosyna papou

Transfer of Pteridophora alberti

INCOMING[1] Settlement	Total[2]	Origin	No.	Total	OUTGOING Destination	No.	No. shot by and retained by present owner
Bubgile	16	Koriom	4	-			4
		Kupeng	10				
		Kwiop	1				
		Togban	1				
Koriom	5	Kupeng	4	5	Bubgile	4	7
		Togban	1		Togban	1	
Kwiop	5	Kosap	1	2	Bubgile	1	1
		Kwima	1		Tabiguba	1	
		'Simbai'	3				
Togban	5	Bokapai	1	2	Bubgile	1	2
		Koriom	1		Koriom	1	
		Kupeng	2				
		Matsomph	1				
Kwima	9	Ambiap	3	-			-
		'Kaironk'	4				
		Nimbra	2				
Kupeng	2	Ambiap	1	16	Bubgile	10	-
		Kimimbong	1		Koriom	4	
					Togban	2	
Kompiai	-			-			-
Bokapai	-			1	Togban	1	-
Tsuwenkai	-			-			5
	42			27			19

1.2. See note Charmosyna papou

APPENDIX 4

Directions of Plume Transfer

The following tables list for the ten species considered in Appendix 3 the directions of transfer of their plumes for each of the nine settlements where censuses were conducted. An explanation of the categories of direction can be found in section 9.2.

1. Charmosyna papou (195 cases)

Settlement	% Incoming From							% Outgoing to					
	Total	Shot in home territory	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]	Total	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]
Bubgile	86	5.8	1.2	5.8	3.4		83.7[3]	1	100				
Koriom	18	33.3	5.5			61.1		1		100			
Kwiop	55	9.9	12.7			7.27	70.8	-					
Togban	14	21.4		14.3			64.3	-					
Kwima	1						100	-					
Kupeng	12					16.6	83.3	2		100			
Kompiai	-							-					
Bokapai	-							5		100			
Tsuwenkai	-							-					

1. Includes Minj-Banz and Nondugl areas of Wahgi Valley.

2. Areas beyond range of foot traveller. Mostely coastal areas of Port Moresby, Rabaul and Lae.

3. Includes numbers shot in coastal areas by contract labourers.

2. Psittrichas ulgidus (138 cases)

Settlement	% Incoming from: Total	Shot in home territory	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other	% Outgoing to: Total	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]
Bubgile	29	10.3	28.6	2.8	37.1		5.7	1	100				
Koriom	20		85	5		10		-					
Kwiop	21		28.6	9.6	28.6	33.3		5		100			
Togban	13	15.4	69.2		15.4			6		100			
Kwima	8				100			2		50		50	
Kupeng	4				100			15		100			
Kompiai	2				100			6		100			
Bokapai	-							4		100			
Tsuwenkai	1				100			1		100			

3. Tanysiptera galatea (146 cases)

Bubgile	42	35.7			26.2		38.1[3]	8	100				
Koriom	13		100					-					
Kwiop	26		7.7	30.7	23.1	38.4		-					
Togban	4		50				50	10		100			
Kwima	2				100			2		100			
Kupeng	33		12.1				87.9	2		100			
Kompiai	-							-					
Bokapai	-							2		100			
Tsuwenkai	2				100			-					

4. Epimachus fastosus (38 cases)

Settlement	% Incoming from: Total	Shot in home territory	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other	% Outgoing to: Total	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]
Bubgile	5		80		20			1		100			
Koriom	4		50			50		-					
Kwiop	9		33.3		55.5	11.1		6		83.4		16.6	
Togban	-							1		100			
Kwima	3	33.3		66.6				3		100			
Kupeng	1				100			1		100			
Kompiai	1		100					-					
Bokapai	-							2		50		50	
Tsuwenkai	-							1			100		

5. Epimachus meyeri (5 cases)

Bubgile	-	100						-					
Koriom	-							-					
Kwiop	1			100				-					
Togban	1						100						
Kwima	-							-					
Kupeng	-							-					
Kompiai	-							-					
Bokapai	-							-					
Tsuwenkai	-							-					

6. Astrapeia stephaniae (247 cases)

Settlement	% Incoming from: Total	Shot in home territory	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other	% Outgoing to: Total	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]
Bubgile	63	21.9	21.9	36	1.6		17.2	13	100				
Koriom	23	43.5	17.4	39.1				2	100				
Kwiop	62	4.8		71	3.2	21		26	11.5	30.8		57.7	
Togban	23	21.7	34.3	26.1	4.3		13	-					
Kwima	12	8.3	8.3	41.6	41.6			1		100			
Kupeng	3				100			11		100			
Kompiai	-							1		100			
Bokapai	2	100						2		100			
Tsuwenkai	-							2		100			

7. Lophorina Superba (88 cases)

Bubgile	6	100						2	100				
Koriom	11	45.5	54.5					-					
Kwiop	13	7.6	69.1	23.7				5	40			60	
Togban	10	90	10					1		100			
Kwima	10		60		40			6		100			
Kupeng	3	33.3	33.3		33.3			1		100			
Kompiai	2		100					9	11.1	88.9			
Bokapai	2	100						-					
Tsuwenkai	3	100						7		100			

8. Paradisaea raggiana (84 cases)

Settlement	% Incoming from: Total	Shot in home Territory	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]	% Outgoing to: Total	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]
Bubgile	1			100				5	100				
Koriom	11			100				1	100				
Kwiop	18			72.3		27.7		14					
Togban	3					100		-					
Kwima	12			83.3		16.7		2			100		
Kupeng	-							-					
Kompiai	4			100				-					
Bokapai	-							-					
Tsuwenkai	13			53.8			46.2	-					

9. Paradisaea minor (222 cases)

Bubgile	54	46.3	48.2		5.5			4	25	75			
Koriom	9		88.9	11.1				2		100			
Kwiop	21	23.8	42.9	4.8	19.1	9.5		42		76.2		19	4.8
Togban	11	45.5	45.5				9	4		100			
Kwima	12	16.7			83.3			20		75	5	25	
Kupeng	4		25		75			5		100			
Kompiai	7		71.4		28.6			7		42.9		57.1	
Bokapai	9	33.3	22.2		44.4			4		75		25	
Tsuwenkai	7		14.3		85.7			-					

10. Petridophora alberti (87 cases)

Settlement	% Incoming from: Total	Shot in home territory	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]	% Outgoing to: Total	Downstream	Upstream[1]	Simbai	Cross-Jimi	Other[2]
Bubgile	20	20	80					1					
Koriom	12	58.3	41.7					5	20	80			
Kwiop	6	16.7	16.7	16.7	50			2		50		50	
Togban	7	28.6	42.8	28.6				2		100			
Kwima	9				100			-					
Kupeng	2				100			16		100			
Kompiai	-							-					
Bokapai	-							1		100			
Tsuwenkai	5	100						-					

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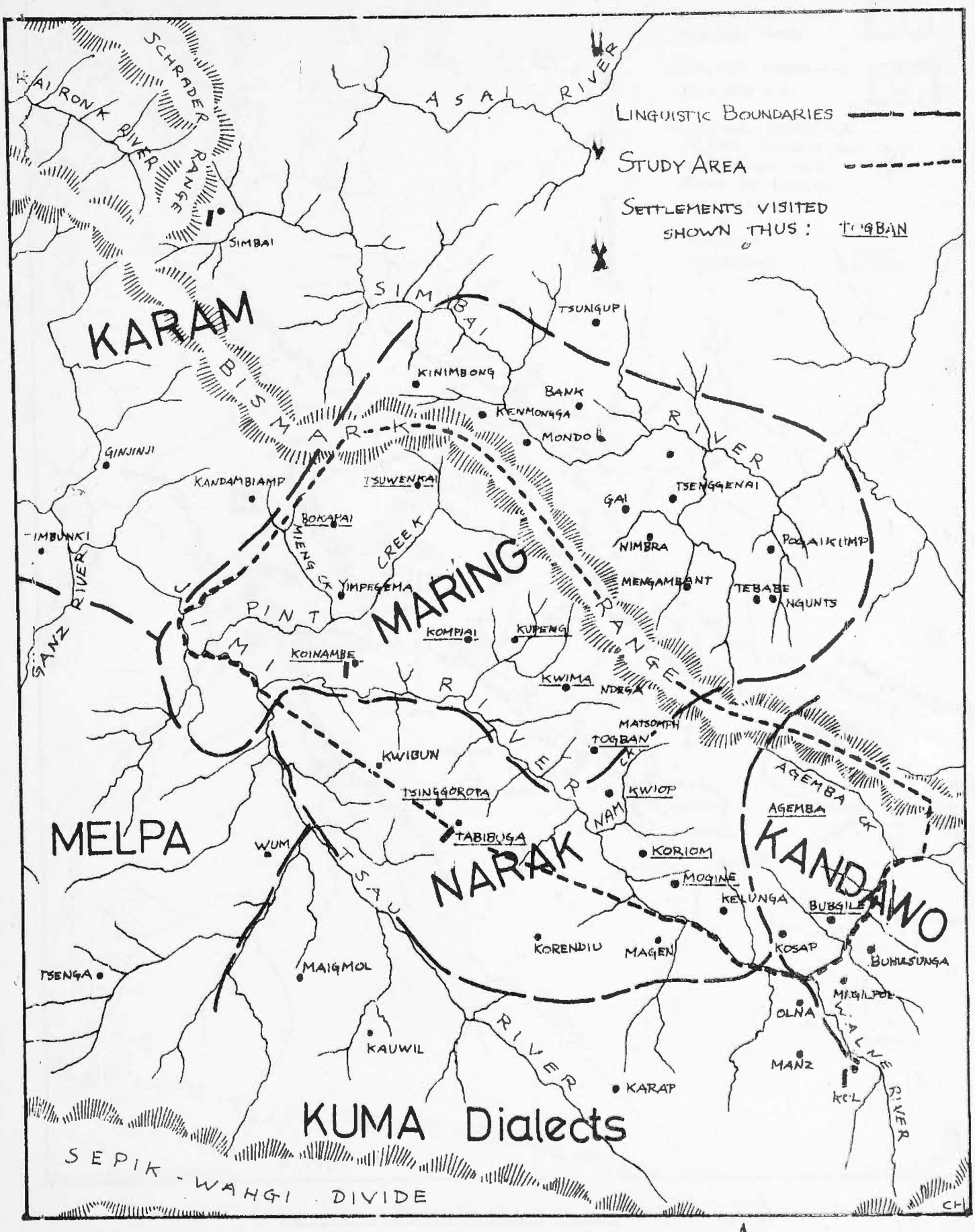
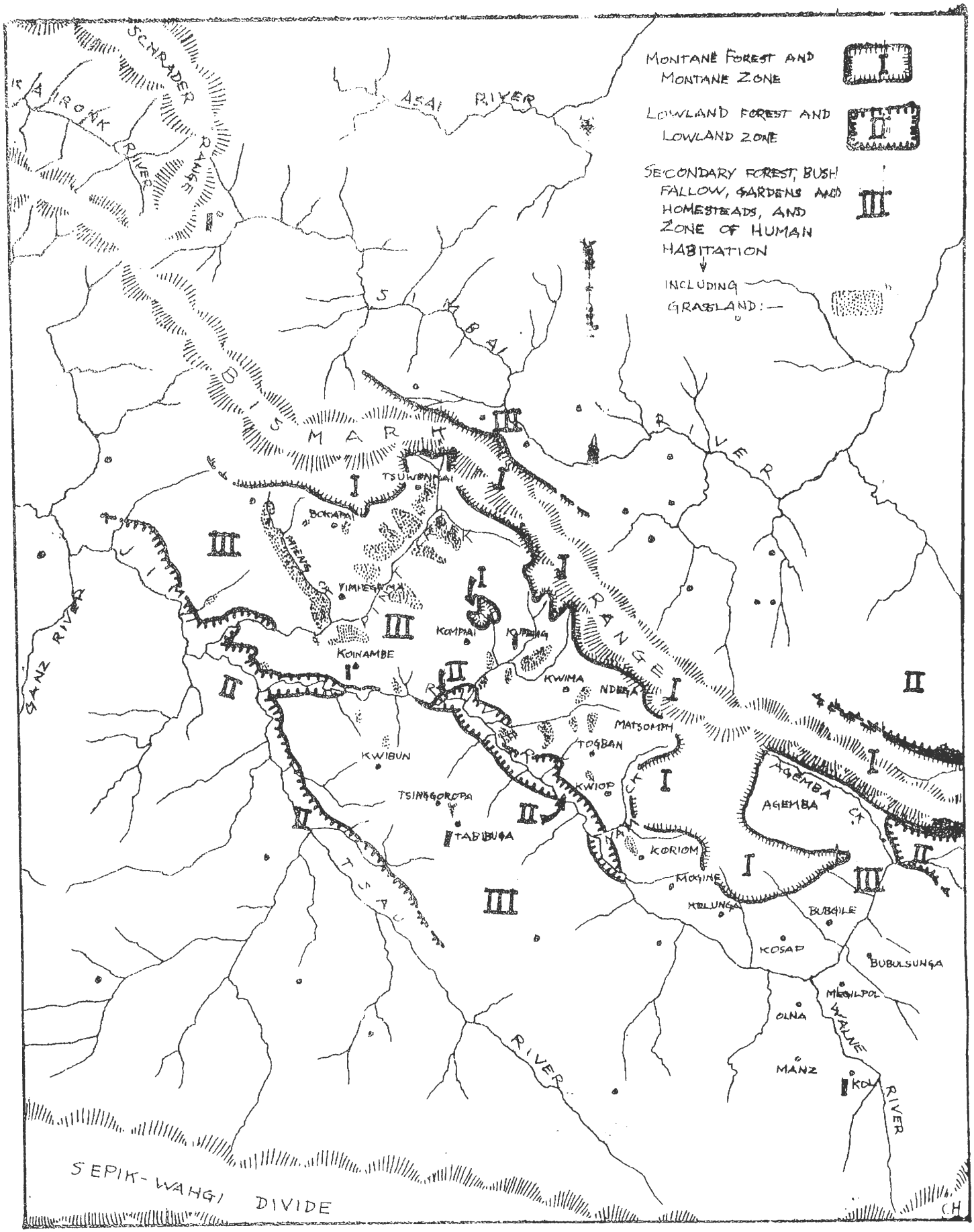
MAP 1

THE STUDY AREA AND LINGUISTIC BOUNDARIES



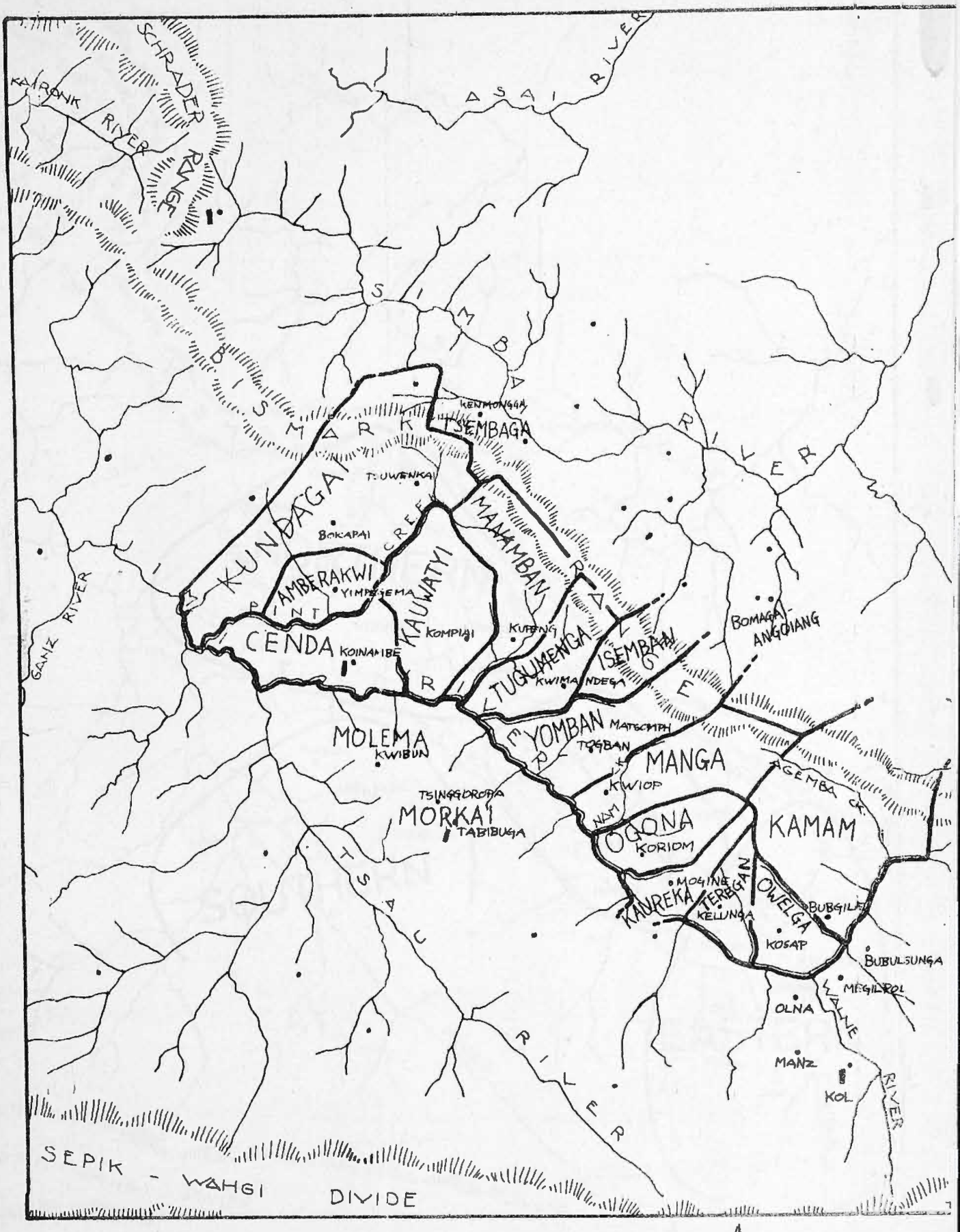
MAP 2

VEGETATION TYPES AND ECOLOGICAL ZONES



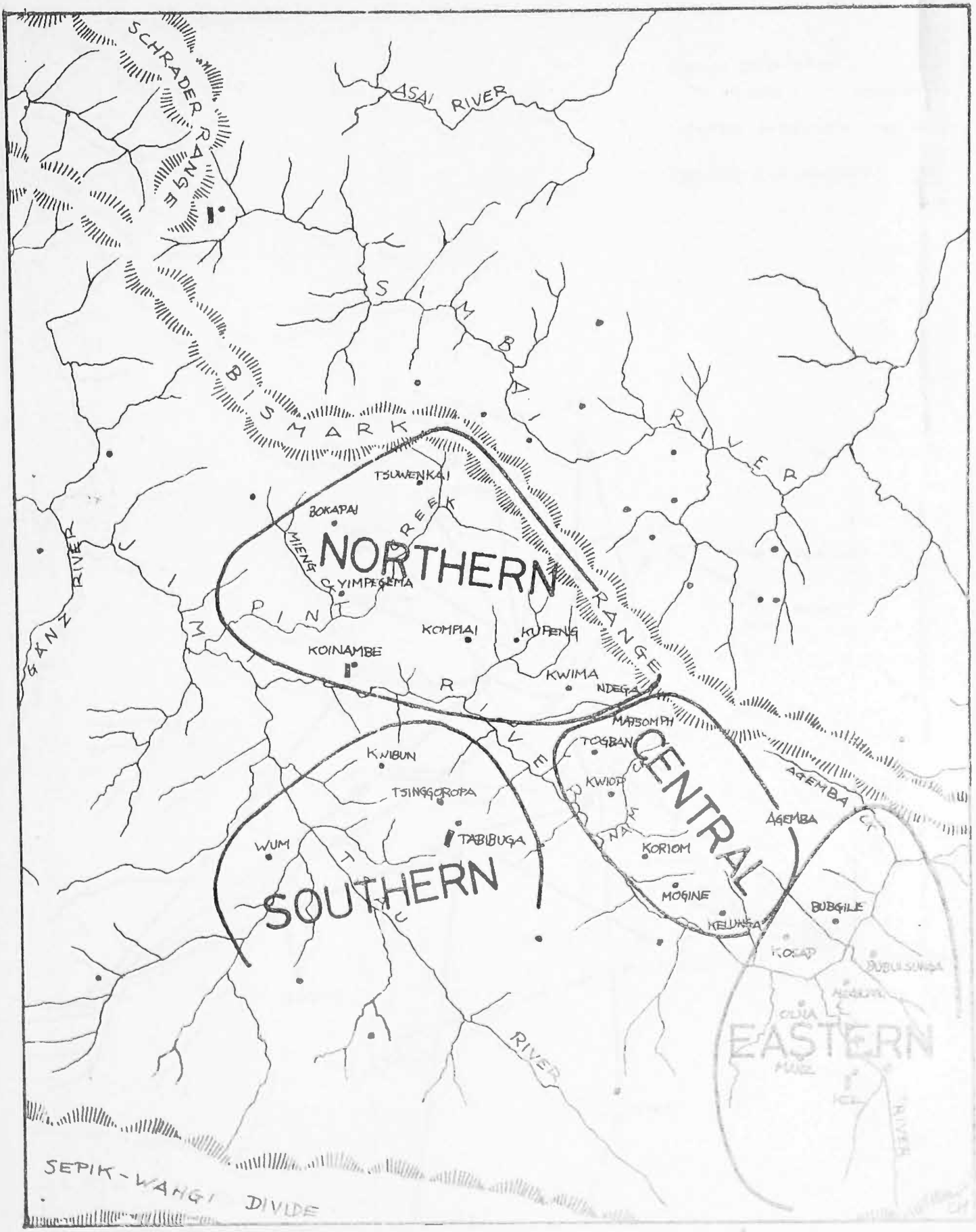
CLAN GROUP TERRITORIES

MAP 3



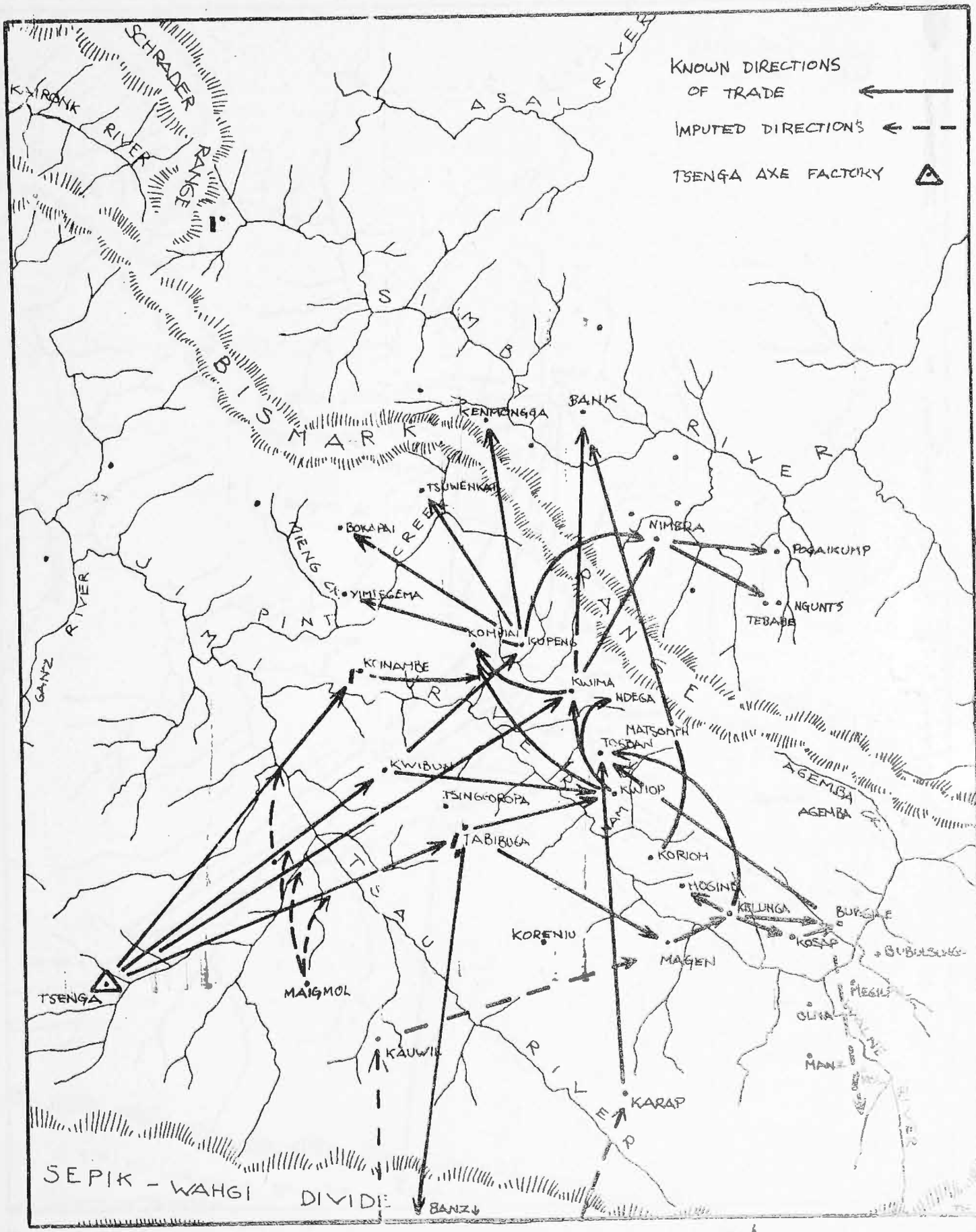
MAP 4

TRADE AREAS



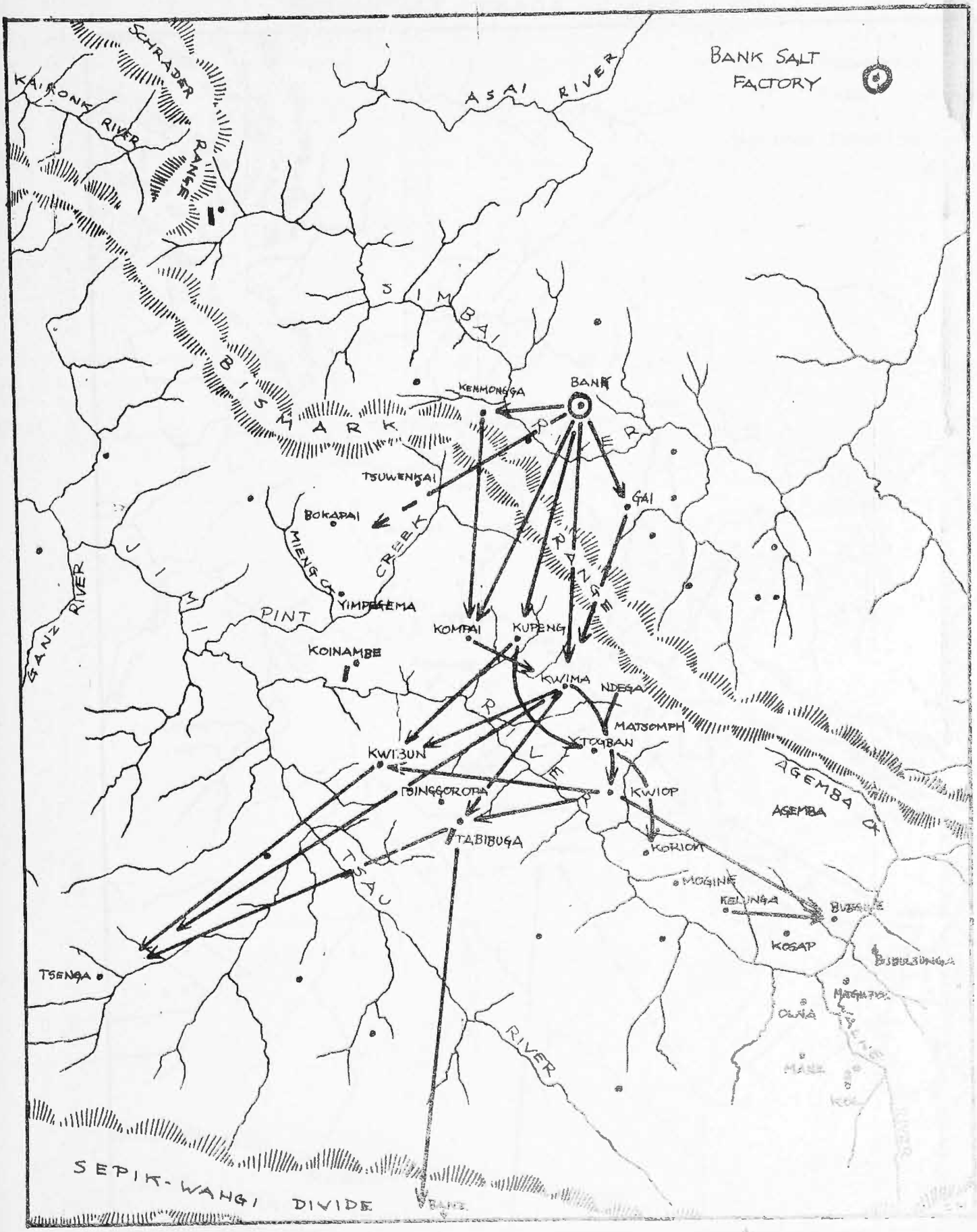
MAP 5

PRECONTACT TRADE IN STONE AXES



MAP 6

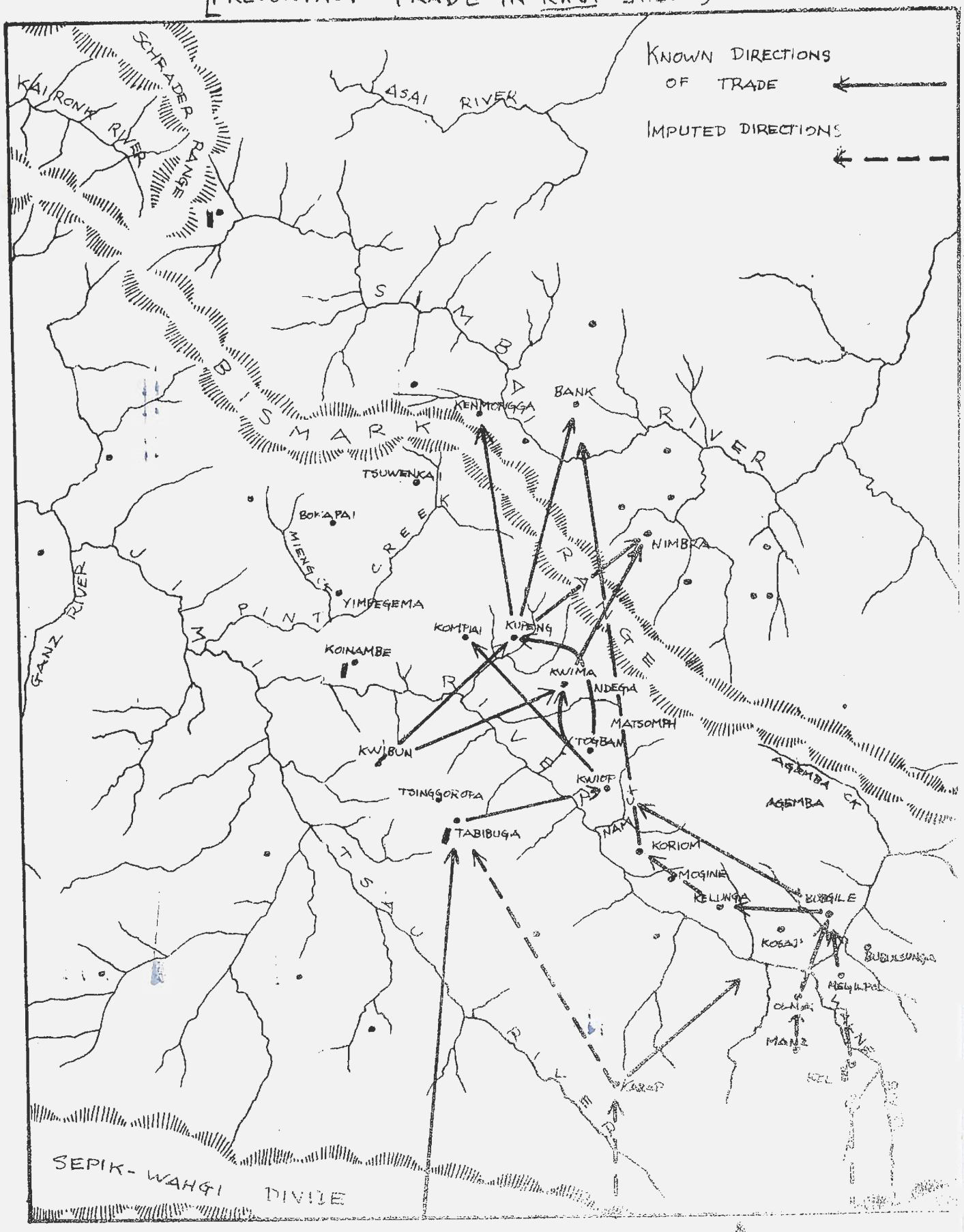
PRECONTACT TRADE IN SALT



- GOVERNMENT REST HOUSES

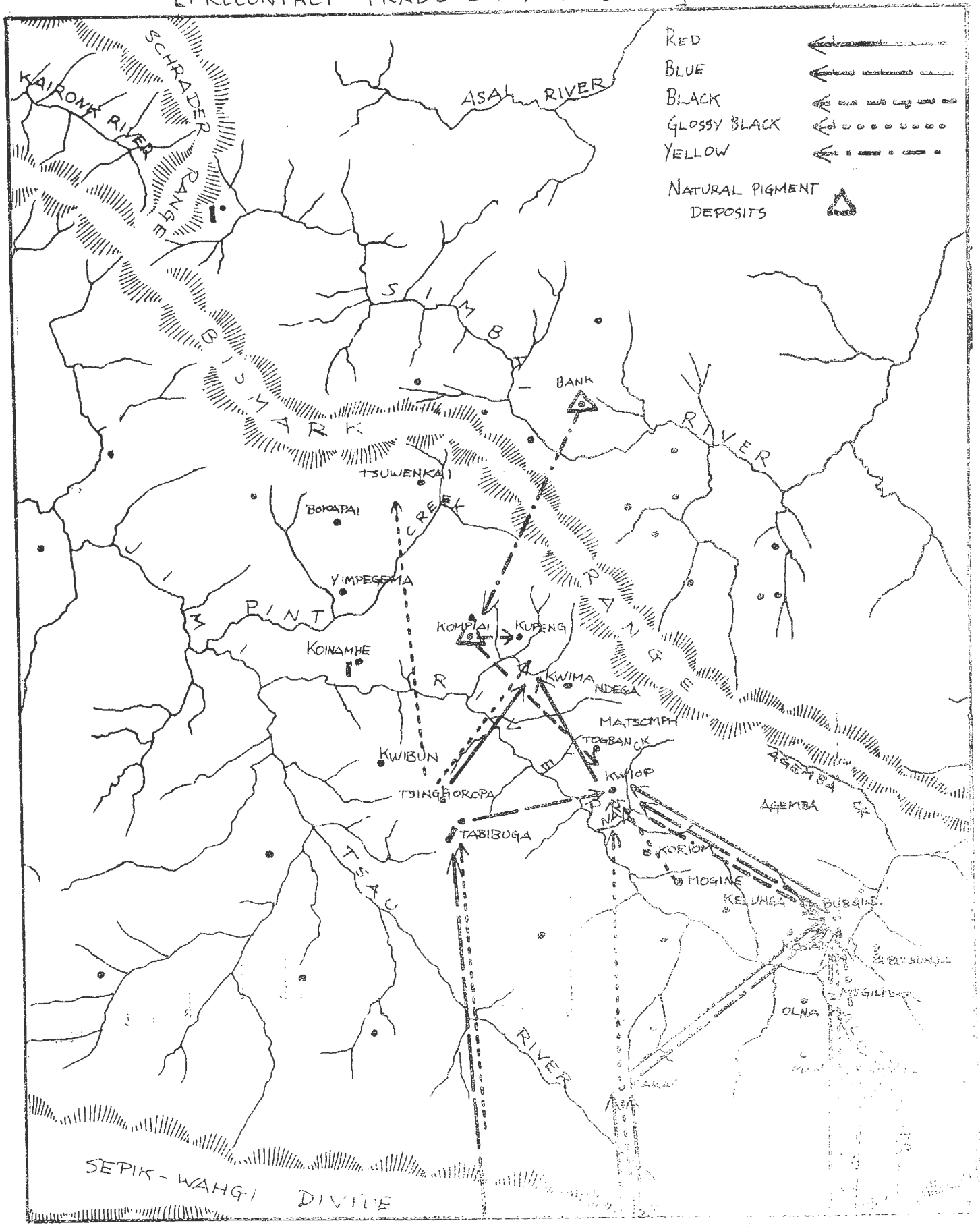
MAP 7

[PRECONTACT TRADE IN KINA SHELL]



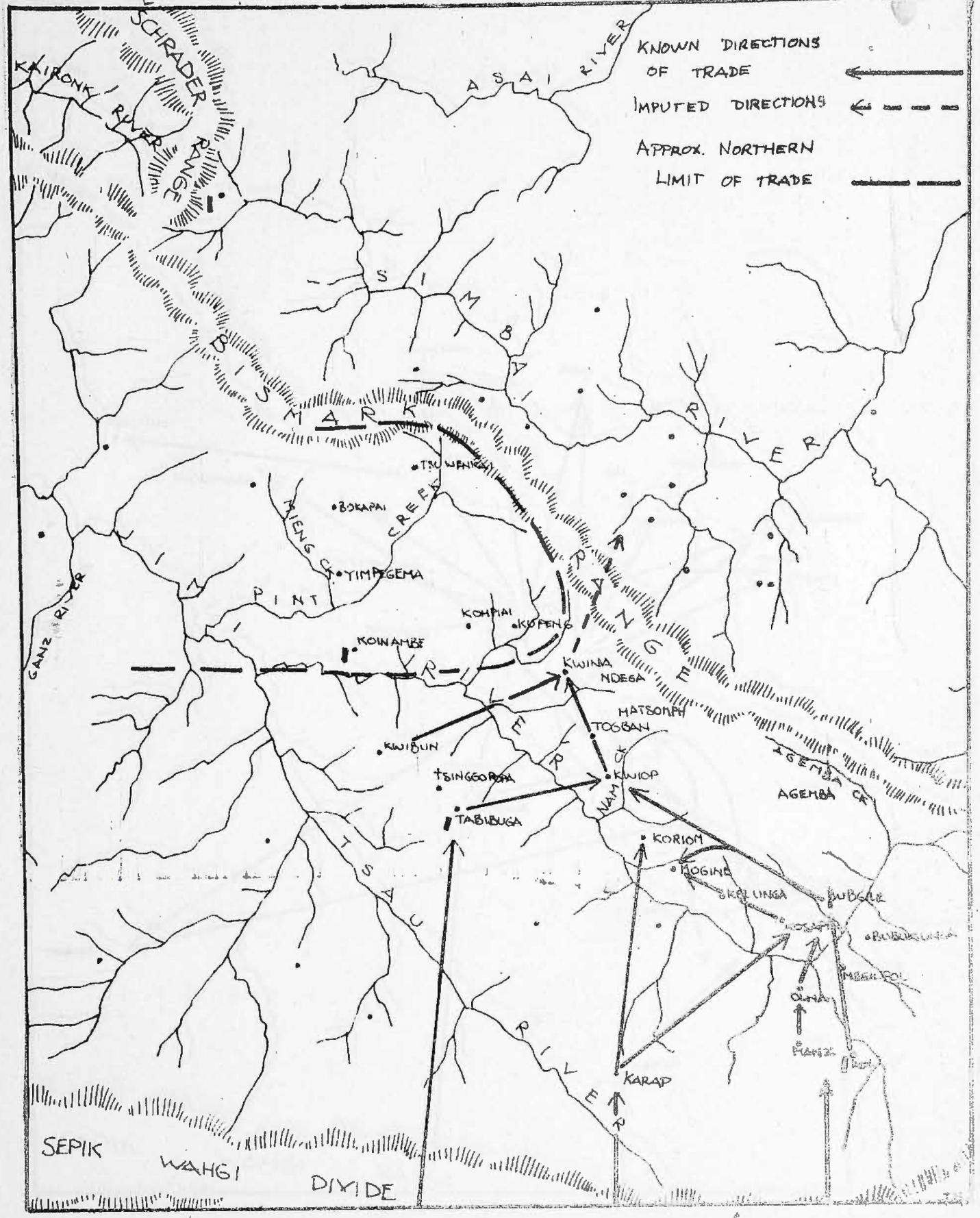
MAP 8

[PRECONTACT TRADE IN PIGMENTS]



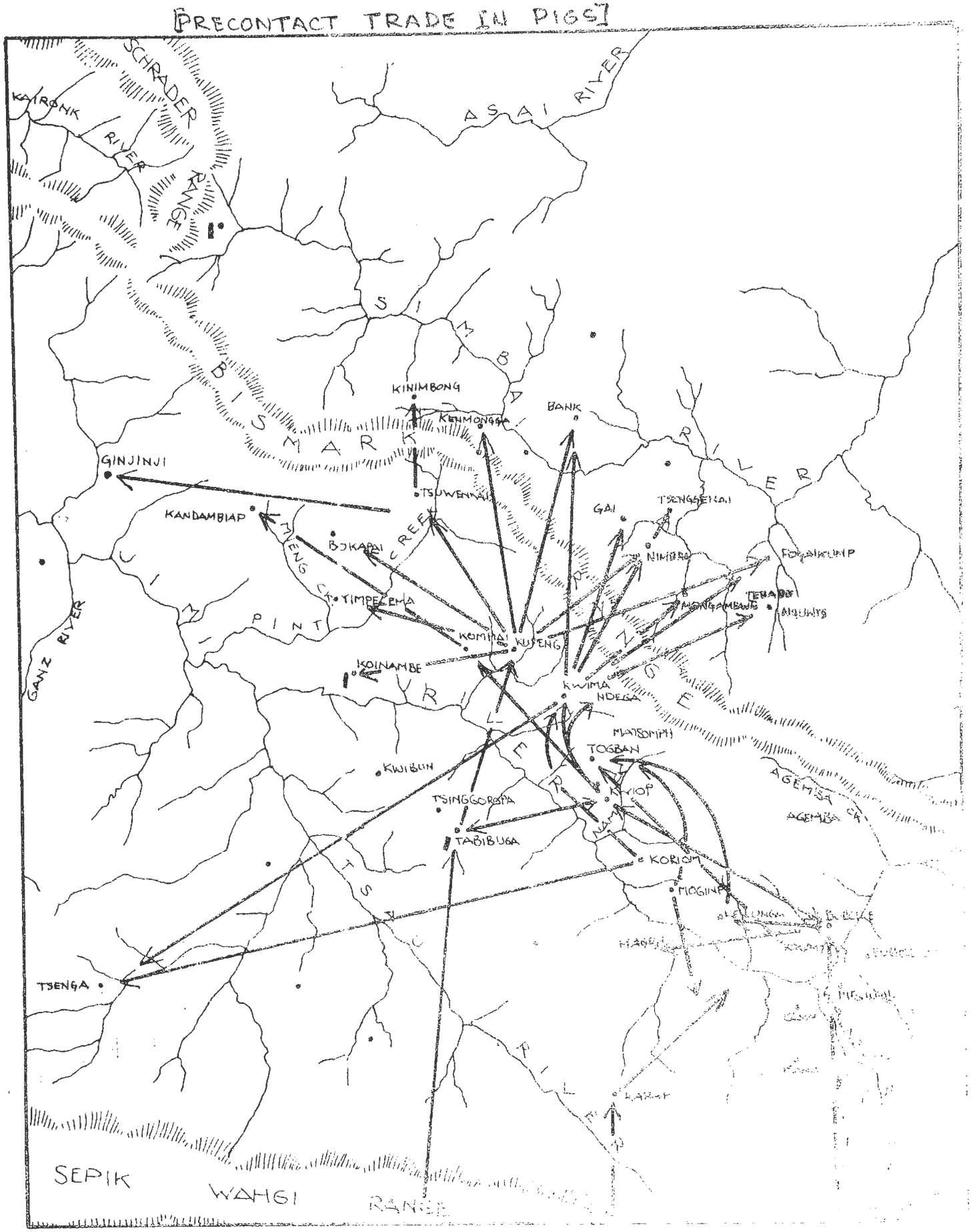
MAP 9

[PRECONTRACT TRADE IN PARADISAEA RAGGIANA]



MAP 10

[PRECONTACT TRADE IN PIGS]



• GOVERNMENT REST HOUSE