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No. 49

BISMARCK - SCHRADER REPORTS : No. I

PATROL OF CONTACT. 1965

William C. Clarke

MAY 1977



The material contained in these Working Papers constitutes a series of progress reports on work being carried out in the Anthropology Department of the University of Auckland. The Working Papers are not intended for public circulation because of their tentative and preliminary status, but are being privately circulated on a limited basis, for the purpose of inviting comments and suggestions from interested workers on the ideas set out in them. These papers are not finished products embodying the final views of their authors, and readers should note that they are not to be cited without clear reference to their tentative and preliminary character. No Working Paper is to be reproduced without the consent of its author.

The first thing I noticed when I stepped
out of the plane was the fresh air. It was
so different from the stale air of the city.
I had heard that the mountains were beautiful,
but I didn't realize how beautiful they would be.
The view from the top of the mountain was
incredible. I had never seen anything like it
before. The sun was shining brightly, and
the clouds were so low that they looked like
a sea of white. I felt like I was on top of
the world. It was a truly amazing experience.
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PATROL OF CONTACT, 1965

William C. Clarke
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EDITOR'S NOTE

Since early 1960 the Department of Anthropology at the University of Auckland has had staff and graduate students conducting research in the Kaironk Valley and adjacent areas of the Bismarck and Schrader Ranges of the Madang and Western Highlands Provinces of Papua New Guinea. Much of this work has been undertaken when the peoples of that region were at early stages of contact with Australian Administration, Missions and other external agencies.

We have realised that not only we but a number of others have kept journals or drafted unpublished or semi-published reports on early patrols and surveys, and that though these are in most cases unsuitable for extended publication in scholarly journals they are nevertheless historical documents of some interest which could appropriately be made more widely available to anthropologists, geographers and historians of Papua New Guinea, both Papua New Guinean and expatriate.

Our intention is to present a series of these journals and reports in our Working Papers. We are very pleased that the first in this series is Professor Bill Clarke's very interesting account of the 1965 Administration Patrol in the Jimi Valley and Schrader Range which he accompanied. His report is now printed exactly as drafted in 1965-66, apart from the omission of a concluding section in which he related his experiences on the patrol to problems of development in Papua New Guinea as they then appeared.

Since 1974 Dr Clarke has been Professor of Geography at the University of Papua New Guinea. He commenced fieldwork in Papua New Guinea in 1964-65 as a member of the National Science Foundation Project on "Human Ecology of the New

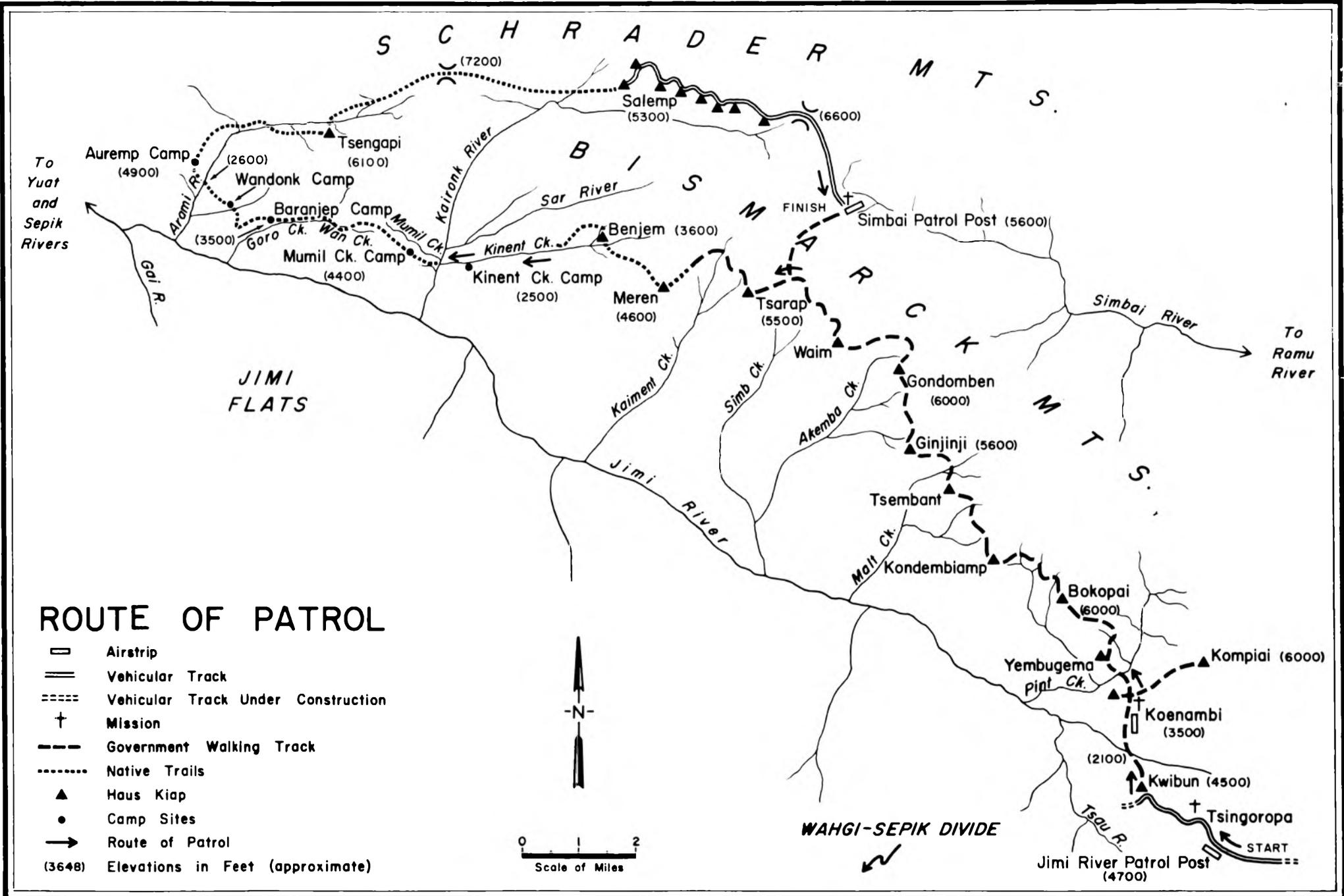
Guinea Rainforest", directed by Professor A.P. Vayda. From this resulted his book on the ecology of a Maring community in the Simbai Valley, Place and People (Berkeley, University of California Press, and Canberra, ANU Press, 1971).

Other of his publications relating to Papua New Guinea include:-

- 1966 From Extensive to Intensive Shifting Cultivation: A Succession from New Guinea. Ethnology, 5:347-359.
- 1967 Soil Fertility and Cultivation Practices in New Guinea. Journal of Tropical Geography, 24:7-11. (With John M. Street).
- 1970 Two Stone Spear or Dagger Heads from the Bismarck Mountains, Australian New Guinea. Records of the Papua and New Guinea Museum 1:42-46. (With Susan Bulmer)
- 1971 Road Development in the Territory of Papua and New Guinea. The Geographical Review, 61:302-303.
- 1973 Temporary Madness as Theatre: Wild-Man Behaviour in New Guinea. Oceania, 43:193-214.
- 1973 Social Scientists.; assumptions and alternatives. New Guinea, 7(4):41-62. (With Eugene Ogan). (Also published as "Assumptions and Alternatives: Recent Research by Social Scientists in Papua New Guinea" in J. Fischer (ed.) Foreign Values and Southeast Asian Scholarship. Berkeley: Center for South and Southeast Asia Studies, University of California. pp.264-290.)
- 1973 The Dilemma of Development. In H.C. Brookfield (ed.), The Pacific in Transition: Geographical Perspectives on Adaptation and Change. London: Edward Arnold. pp.275-298.
- 1974 "Traditional House Types" and "Location of Places". In E. Ford (ed.), Papua New Guinea Resource Atlas. Milton, Queensland: Jacaranda Press,. pp.54-55.
- 1975 Man, Land, and Poetry: Geography in Poetic Expression. Inaugural Lecture, University of Papua New Guinea. 29pp.
- 1976 The Maintenance of Agriculture and Human Habitats within the Tropical Forest Ecosystem. Human Ecology, 4, 3. (Also appears in slightly altered form in Report of Symposium on Ecological Effects of Increasing Human Activities on Tropical and Subtropical Forest Ecosystems, Pub. No.3, Australian UNESCO Committee for Man and the Biosphere, 1976
- 1976 Wabag and Wapenamanda. In R. Jackson (ed.), An Introduction to the Urban Geography of Papua New Guinea. University of Papua New Guinea, Dept. of Geography, Occasional Paper No.13: 209-232.
- 1977(i) (in press). The Structure of Permanence. In T. Bayliss-Smith and R. Feachem (eds.), Human Ecology in the Pacific. London: Academic Press.

- 1977(ii) (in press). A Change of Subsistence Staple in Prehistoric New Guinea. Proceedings of the Third International Symposium on Tropical Root and Tuber Crops. Ibadan: International Institute of Tropical Agriculture.
- 1977(iii) (in press). Wabag and Wapenamanda. Encyclopaedia of Papua New Guinea, supplement. Melbourne University Press.







PATROL OF CONTACT, 1965

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INTRODUCTION

For the past four to five decades it has been the policy of the Australian government of the Territory of Papua and New Guinea to expand progressively the area under administrative control. Since the end of the second World War this 'Europeanization' has been accelerated; in 1952 about 50,000 square miles of the Territory were classed as 'Restricted', that is, areas whose inhabitants were subject to little or no government influence and into which entry was usually prohibited to all white men except members of official armed patrols; by 1962 only about 4,500 square miles remained restricted -- all in isolated, rugged, and sparsely settled regions, notably the dissected upland near the border with West Irian and the mountainous barriers that ring the populated and developing Central Highlands. Probably by the end of 1966 all of the Territory will be officially under control. Mostly, this persistent, if not always coherent, extension of European influence into previously uncontacted areas has been achieved by the penetration of the Administration's exploratory patrols either on foot or at times by canoe and raft. A few of these expeditions are relatively well known;¹ but usually, the job done, the Patrol Officer's diary of a journey is filed, and the accomplishments of the expedition -- one link in the aggregate process of extending western ways -- are forgotten. In this paper, in an attempt to convey the character of such exploratory and pacificatory patrols, to show their significance

to the modern development of New Guinea, and to record some of the natural and human features of a little known area. I shall describe and discuss a 'Patrol of Contact' made in 1965 in the Bismarck and Schrader Mountains of the Trust Territory of New Guinea.

The patrol was organised and led by the kiap (the Pidgin-English term for Patrol Officer) of the Jimi River Patrol Post, one of the scattered network of isolated outstations through which New Guinea's 'government by patrol' (Mair, 1948) is executed. The Jimi River Post was established in the late 1950's following a few preliminary sallies into the rugged Jimi River Valley by patrols from the previously established stations in the Central Highlands to the south. . . . As is true of most of the government outstations in New Guinea, the dominant feature of the Jimi River Post is an airstrip, which is grass-covered and about 1,500 feet in length. Trailing up the steep ridge that rises above the airstrip is the patrol post settlement, which includes a small trade store, a government school, a chapel, warehouses and sleeping quarters for native labourers and prisoners, gardens, a medical aid post, and, near the top of the ridge set among attractive lawns and decorative plantings, the government office, a small saw mill, and the Patrol Officer's home.

From this headquarters the kiap, sometimes assisted by a Cadet Patrol Officer, administers many hundreds of square miles and about 26,000 people. The intensity of Administration influence upon any part of the population naturally depends upon distance from the Patrol Post and length of time since initial contact, but, by the efforts of several successive kiaps, all of the territory within two to three days' walk from the Patrol Post is now under effective government control and is linked to the Patrol Post with narrow earthen vehicular roads or good walking tracks. The only part of the area belonging in the Jimi River kiap's jurisdiction that is still to some extent uncontrolled lies on

the westernmost side of his territory several days' walk down the Jimi River Valley. Occasional patrols penetrated this area before 1965, but many of the inhabitants remained uncontacted, and, because of the distance from the Patrol Post, government authority remained tenuous even among the people that had been seen. In order to extend government control and to augment the effects of the past expeditions, the patrol described in this paper walked into this region in April of 1965. Map I shows the route followed.

THE DIARY OF THE PATROL

April 8: Jimi River Patrol Post (4,700') across the Jimi River (2,100') to the Anglican Mission at Koenambi (3,500').

Early in the morning the local natives' yodelling cries sounded through the valleys around the Patrol Post, announcing the day's unusual event and calling for men to assemble to carry the patrol's supplies to the first haus kiap² along the route. When the confusion of the gathering of the carriers, the arrangement of supplies, and the tying of two-man loads to carrying poles had ended, there were present about eighty men -- sixty local natives serving as temporary carriers and twenty permanent members of the patrol, the latter group including three white men (the kiap, a Cadet Patrol Officer, and myself), six native policemen chosen from the eighteen or nineteen who make up the police force of the Patrol Post, a native Medical Assistant, and several cooks, interpreters, and miscellaneous auxiliaries. After leaving the Patrol Post -- the native carriers initially yelling and moving with their excited stamping dance -- the party walked toward Kwibun haus kiap on a vehicular track suitable for four-wheel drive vehicles. This stretch of road, which is only a few miles long but, of necessity, deeply cut into the slopes that lead down to the Jimi River, took over

a year to build. The entire construction was done with government-supplied handtools by drafts of native labourers, who at first worked with reluctance but have since come to appreciate the present and potential uses of the road, which is only a small section of a vehicular road that will eventually lead southward over the Wahgi-Sepik Divide and vastly expand the Jimi Valley's connections -- now almost entirely by air -- with the outside world as represented by the economically advanced Central Highlands. In effect, such levies for labour on roads, airstrips, or as carriers, are the taxes of recently contacted New Guineans; subsequently, after they have at least partially entered a commercial economy, a monetary tax is imposed.

The landscape along the road to Kwibun is typical of that surrounding the Patrol Post. The course of the road, which follows in an undulating way the 4,500-foot contour line, leads the walker through the most densely settled part of the inhabited zone, which in this vicinity extends from an elevation of about 3,000 feet to 6,000 feet. Within this area is a mosaic of native gardens and secondary vegetation in various stages of regrowth. The gardens are of two principal types. One, the Pandanus garden, or orchard, consists of clusters of the twisted Pandanus trees (P. conoideus Lamarck, sensu Merrill and Perry), which produce a long, heavy fruit -- sometimes over two feet in length and as much as fourteen to fifteen pounds in weight -- with a multitude of seeds, the steamed mesocarp of which is made into a highly esteemed oily sauce. Because the Pandanus trees probably live for at least fifty years, the orchards are, in effect, permanent, and a producing group of trees may be inherited through two or three generations. In contrast are the more temporary swiddens, themselves of several sub-types but all planted in part with sweet potatoes. Aside from this ubiquitous crop, one garden may be dominated by a combination of sugar cane, bananas, and Saccharum edule (a cane grown for its edible inflorescence), while

another garden is planted with a mixture of manioc, the Old- and New-World taros (Colocasia and Xanthosoma), and a variety of yams (Dioscorea spp.). Other food crops include the greens, Hibiscus manihot and Rungia klossii, pumpkins, cucumbers, and a variety of beans. The people here practice none of the elaborate methods of tillage or drainage that have so impressed travellers in the highland valleys to the south.³ Rather, their agriculture is the typically lowland 'messy' shifting cultivation: stumps and charred logs litter the gardens, the intermingling of the many crops appears random,⁴ the ground is prepared for planting simply by burning some of the rubbish and by dibbling holes for the planting of stock or seeds. Scattered through the swiddens, as well as in the secondary growth and Pandanus orchards, are two other food-producing trees: the breadfruit (the seeds, but not the flesh, of which are eaten) and Gnetum gnemon (the seeds and leaves of which are eaten). All the producing swiddens are fenced to protect the crops from marauding pigs, wild and domestic; but the Pandanus orchards, which are not susceptible to damage by pigs, remain unfenced and to an eye unfamiliar with the local scene might appear to be a part of the spontaneous vegetation. Once abandoned to fallow -- about fifteen months after the initial planting -- the swiddens revert quickly to secondary regrowth. Depending on its age, the micro-environment of the site, and the accidents of seed dispersal, the secondary vegetation takes one of many forms: grassy patches on drier ridge crests; a jungle of saplings, grasses, and sprawling ferns; a woodland composed of tree ferns and a few species of weed trees, such as Dodonaea viscosa and Alphitonia incana; or a young mixed forest of many species reverting to the climax of montane rain forest.

Although the numerous gardens evince a sizeable population, few native habitations can be seen, because the people here -- as is true in all of the Australian part of highland New Guinea west of the area near

Goroka (Read, 1954:15) -- live not in villages but in scattered homesteads that form small hamlets or dispersed neighbourhoods. Moreover, the dwellings of this part of the Jimi Valley are only five to six feet high and are usually so concealed by decorative and economic plants as to be invisible, save from close at hand. But, though we could rarely see their houses, the people themselves were much in evidence along the road. Groups of women and young children passed between their homes and gardens; clusters of adolescent girls chattered, watched the passing patrol, and coquetted favoured young men of other clans; entire neighbourhood groups of men, women, and children worked at road maintenance and improvement.

Occasionally near the road we saw small, shaded plots of coffee trees grown from seedlings provided by the Department of Agriculture and distributed to the native gardeners by the kiap. This high-quality mountain coffee, which is the most important commercial crop of the Central Highlands, often spreads quickly into recently contacted areas; but because problems of marketing the over-abundant commodity will soon trouble producers in New Guinea, there is little official optimism about further expansion (Shand, 1966).

Another recent development in the Jimi Valley is the establishment of several missions, an activity always associated with the founding of patrol posts and the penetration of government expeditions into newly contacted areas. The neat grounds and corrugated metal buildings of the Nazarene Mission at Tsingoropa are visible midway on the road between the Patrol Post and Kwibun; several miles to the east of the Patrol Post is a Catholic Mission; several miles to the west is Anglican territory. This curious division of the region into contiguous 'parishes', each of a different religion, is typical of much of New Guinea and has often confused the native peoples, who on first seeing white men thought them to be all of one kind. In places, on learning

of the schisms in the missionaries' beliefs -- and perhaps encouraged by semi-literate native evangelists to renew their pre-contact habit of inter-clan warfare -- the people of one parish have battled those of another. It seems unfortunate in an incipient nation with seemingly so little to unify it that part of the process of expanding European influence should have such potentially divisive possibilities.

Many excited men of the area near Kwibun awaited the patrol's arrival at the grounds of the haus kiap. The transfer of supplies from the first group of carriers to this fresh contingent was accomplished quickly amid much yodelling and yelling. When the carriers were loaded, the patrol turned from the vehicular road to a narrower government walking track that led steeply down to the Jimi River over 2,000 feet below. From near Kwibun we could see clearly the distribution of settlement and types of vegetation in the distant view across the river to the south face of the Bismarck Range. Two continuous belts of primary forest occur: one covers the slopes of the valley below about 3,000 feet; the other extends from near 6,000 feet upwards for another 1,000 feet or more to the undulating crest of the mountains. Between these two belts of forest lies the settled, gardened zone already described. On its higher side agriculture is probably limited by the base of the row of cumulus cloud that frequently extends along the higher part of the range. The disappearance of agriculture on its lower side is less easily explained; most influential are biological and social detriments to human settlement. Malaria, scabies, bush typhus, and tinea all seem to be commoner at lower elevations. And before the Administration prohibited ambush and warfare, it was hazardous to garden or live in a place far isolated from the bulk of the population which was concentrated between 4,000 and 6,000 feet. Some native informants, in explaining the presence of a few gardens scattered in the lower belt of primary forest, said that such clearings are a recent

innovation and are planting gardens at lower elevations than they did before the kiap came. Brookfield (1964:34) suggests a tendency toward conditions favouring droughts as another possible deterrent to cultivation at the lower elevations, at least in some parts of New Guinea.

Several hundred feet below Kwibun the track passed a native house ringed by a fence of Heliconia and the omnipresent Cordyline, a ritual and decorative plant of great importance. From behind the fence came a loud wailing, which we were told was part of a funeral ceremony for a woman who had recently died. Sitting on the ground about the house, the crying relatives had symbolized their mourning by daubing their faces and bodies with earth in stripes and patches of grey, orange, and ochre. Nearby -- in accord with the pan-Melanesian custom of distributing pork on momentous occasions -- lay a butchered hog on the banana and Heliconia leaves that serve as a wrapping when the meat is cooked in the earth ovens. The house was representative of dwellings in this vicinity: shaped roughly like a snub-nosed bullet in plan, rounded at the back, squared at the front, about twenty feet long, eight feet wide, six feet high, roofed with Imperata grass, and sided with Pandanus leaves and rough planks set between upright stakes. Because in this area the men live apart from the women and pigs, this particular dwelling was recognizable as a men's house by its lack of a separate entrance and interior sleeping quarters for pigs -- elements that are present in almost all of the women's houses.

Continuing downslope toward the river, we passed through gardens and several types of secondary bush before emerging onto a long, sloping ridge grown with a variety of three-to-six foot high grasses including Themeda gigantea, Eulalia leptostachys, and Imperata cylindrica. There is little reason to doubt Robbins' (1962) belief that such grasslands are anthropogenic -- the result of clearing the forest, burning, and gardening. Once established, the grasses tend to be maintained by

recurrent fires that destroy the saplings of pioneer trees and shrubs which, in this area, include Melastoma malabathricum, Dodonaea viscosa, and Alphitonia sp. The people fire the grasses for many reasons: a several-acre burn along the track was said to have been ignited to gain freshly sprouting Imperata for thatch; other fires are set for an unprofitable kind of hunting; the majority are set for the fun of seeing the grasses burn. Although the grasslands are anthropogenic, their specific location within the matrix of primary and secondary vegetation is determined by environmental conditions: the grasslands are on ridges, not in valleys; and north-facing slopes are grassier than south-facing slopes.⁵ That is, in this part of the Jimi Valley the moister areas still revert quickly to forest when the garden clearings are abandoned; it is only in the areas of greatest drainage and insolation that the grasslands appear to be permanent. If population increases, it is to be expected that the forest on all types of slopes where cultivation is practiced will be transformed to grassland -- a process far advanced in many of the densely settled parts of the Central Highlands.

As we approached the Jimi River, the track led from grassland into primary forest. Soon we heard the roar of swiftly flowing water, and the track steepened to almost a ladder of tree roots, then emerged from the forest at an elevation of about 2,100 feet beside the thirty-to-forty wide torrent of the Jimi flowing in a bedrock cleft incised within a somewhat gentler inner gorge. This structure of rejuvenation, which is common to all the larger streams of this region, makes manifest in the landscape the fault movements that are frequently felt.

The permanent members of the patrol and the heavily burdened carriers crossed the river on a precarious bridge of poles and lianas, then climbed through the belt of primary forest and into the zone of secondary bush, gardens, and grassy ridges as far as Koenambi, the site of a new Anglican Mission and an airstrip under construction. In rugged

interior parts of New Guinea the full development of patrol posts and missions is always dependent on airstrips. All supplies from the outside world arrive by air, all travel to and from the rest of New Guinea is by air, and even the limited local export products, such as coffee or vegetables, are shipped on planes.

Because of the importance of air transport, almost no missions are located far from airstrips. In order to encourage the development of the area around Koenambi, the Jimi River kiap has assigned a policeman to help the Mission staff recruit and supervise the native labourers. As with road construction, all the excavation and filling necessary in building the 1,200- to 1,500-foot strip was done with hand tools, and the earth was moved on stretchers of burlap carried by four men. Such airstrips, which are suitable only for light planes, commonly take at least two years to complete.

The Administration's aid to the Mission at Koenambi is representative of the cooperation between the Government and the missions in all of New Guinea. In part, the Administration helps the missions, because one objective of Government policy is that '... in the absence of any indigenous body of religious faith, founded on native teaching or ritual, ...' there be a '... voluntary acceptance of Christianity by the native peoples.' (Hasluck, 1958:98) However, more mundane matters, such as pacification and the establishment of schools and clinics, are of greater concern to most local administrators. Because the Government lacks personnel and funds to provide as many medical and educational services as desired, aid from the missions has always been welcomed and is now encouraged by government subsidies to mission schools. In the Jimi Valley, as in most areas of mission influence, there are scattered many primary schools offering education to the level of Standard II or III. In theory, the schools develop literacy in English and prepare the native children for their changing future. In practice, much of the

teaching is done in Pidgin-English by often nearly illiterate native teachers, who may be more interested in evangelizing than in educating. Because of the inadequacy of such schools, it is often suggested in the Territory that funds for education would be more effectively used if restricted to fewer, but better, government and mission schools.

April 9: Koenambi (3,500') to Kondembiamp Haus Kiap (5,700').

The clear early morning sky -- rare here -- was welcomed as an augury of good weather. The kiap had waited until April to make the patrol, because the drier season often begins in that month; patrols made earlier in the year are likely to find the frequent stream crossings arduous and dangerous.⁶ As the patrol climbed the slope above the mission buildings and the almost completed airstrip, the native labourers stopped work to shout their yodelling cheer; almost all arrivals and departures of the still infrequent white visitors are so acclaimed. Indeed, any moment of excitement leads the native men to release their vibrating cry: oo-a-oo-a-oo-a

Standing out occasionally in the secondary bush along the track, and, because of their great height, visible in the belt of forest along the river below, were magnificent specimens of Araucaria, which in this vicinity seem to occur naturally only at elevations below about 4,000 feet; where individual trees or small stands are found above that altitude, they are always said to have been planted as markers or decorations at house sites or places for ritual slaughter of pigs. In some of the leveller and lower parts of the Jimi Valley there are sizeable stands of Araucaria, though of course a lumber industry could not be developed until linking roads are built.

This day's route lay along the government walking track that connects the series of haus kiap spotted on ridges along the south face of the Bismarck Range. Although the haus kiap are often quite close in

actual distance, deep stream valleys and steep tracks usually separate one from the next. Pint Creek was the first to be crossed of the many streams that have cut deeply into the 'wall' of the Bismarcks. From the Pint crossing at 2,900 feet, the track ascends through gardens and secondary forest to an elevation of near 6,000 feet. About halfway up this slope we reached the Yembugema haus kiap, where the patrol was met by an animated gathering of local people. Speaking in Pidgin-English, the kiap announced that he would soon return to take the annual census and to hear any court cases that the people of the tul tuls and luluais cared to present.⁷ After this message had been translated, and the patrol's cargo had been transferred to the men who 'line' at Yembugema (that is, who assemble there for the census), the patrol continued its ascent, eventually reaching primary forest at about 6,000 feet. Along the track an arched gateway of Cordyline shrubs marked the boundary between the clan cluster censused at Yembugema and the clan cluster censused at Bokopai, the next haus kiap. Enemies at the time warfare was prohibited by the kiap, the men of these two groups now easily transferred the patrol's supplies amid the usual yodelling and shouting. Six years ago when there was a carrier exchange here for one of the first patrols to enter this region, the police had to carry the cargo across the boundary, because neither native group would violate a taboo against entering the territory of an enemy. A strong sense of group territory is, of course, characteristic of all New Guinea, and usually one's neighbours are one's enemies. In this area, after groups who had been defeated in battle or routed by a surprise attack had fled their lands and taken refuge with friendly groups, their territory or parts of it might, after suitable ritual procedure, be incorporated into the territory of the victor. However, though the acquisition of territory may have resulted from warfare, such acquisition was seldom the motive for initiating hostilities. To judge from what the natives say, wars

usually grew out of fights between individuals of different groups; the fights in turn grew out of a variety of situations, including rape, sorcery, poaching of game, damage by one man's pigs to another man's garden, and taking a woman without what was felt to be ample payment or the permission of her male relatives. Once begun, enmity continued at least as long as homicides were not even between the two opposing groups, for there was an ideal of strict one-for-one reciprocity with regard to killing. The natives view the Administration's ban on further wars with mixed feelings. Certainly, in part, enemies found pleasure in their antagonistic relation with each other, and men often speak of pre-contact wars with excitement and glee. But they also frequently assert that life is better since the kiap came, because now people can walk about without fear. In this area a 'shrine' of Cordyline and other ritual plants marks the spot where the officer of one of the initial patrols, probably in 1956, announced the government's intention to prohibit fighting.

Near Bokopai haus kiap is an Anglican Mission outstation staffed by coastal Papuans who school about seventy local children and also offer religious instruction. Adjacent to the Mission establishment is a government medical aid post staffed by a native Aid Post Orderly. The system of aid posts and orderlies was established in New Guinea in 1946 as a means to provide regular medical service to outlying communities. The orderlies receive about two years' training and then are assigned to the field. Often their supplies are meagre, their salaries are low, and in the less developed part of the country their formal education is almost absent prior to induction as an orderly. Despite their lack of education and equipment, there is no doubt that the 'doctors' have improved the health of the people: yaws have been virtually eliminated, treatment has been made available for the prevalent and potentially lethal skin infections and respiratory

maladies, and some of the people may have learned new habits of sanitation from the orderly. Also, because he has spent at least two years at a training centre in one of the towns, the Aid Post Orderly serves as an educative link between the white man and the local community. The orderly's influence depends on his powers of persuasion, for he has no enforcing power; but if he has a strong personality, he may be one of the most important influences in a newly controlled area.

After we left Bokopai we proceeded westward along slopes grown with degraded secondary forest and grassland. Now that the patrol had left the wide vehicular track near the relatively long-contacted area around the Patrol Post, we encountered far fewer people along our route, although a crowd was always present at the haus kiap grounds.

Occasionally, however, we met people on the trail; beyond Bokopai we stopped for a talk and a cigarette with a grey-bearded warrior and his companions. Speaking through interpreters, he told us that his blinded left eye was the consequence of an old battle wound inflicted by an arrow when he failed to duck quickly enough behind his shield. As we passed on toward Kondemiamp haus kiap, the trail led us into an area that was largely grassland, with trees only in the valley bottoms and on the uppermost slopes. Here and there, outstanding on the long grassy ridges, were large clumps of bamboo marking an old house site or perhaps what was once a garden fence made with living bamboo stakes. Before reaching Kondemiamp, we left the area where the commonest language is Maring and entered an area where Karam predominates.⁸

Linguistic boundaries do not necessarily form sharp cultural boundaries in New Guinea; social relations that are based on enmity, reciprocal assistance, and inter-marriage often link clans across linguistic borders, and most people who live near the edge of a linguistic territory are bi-lingual. Agricultural methods and other elements of material and non-material culture also often cross linguistic boundaries.

April 10: Along the south slope of the Bismarck Range from Kondembiamp Haus Kiap (5,700') to Gondomben Haus Kiap (6,000').

The cloud that lay against the mountains abated the morning noises of departure, and the yodelling carriers quickly disappeared into the mist as they left the camp. By mid-morning, however, the cloud was gone from all but the highest parts of the range, and there were views from the trail southwestward to the Jimi Flats where large stretches of grassland appeared among the forest on the valley floor of the lower Jimi River. Were it not for the scattered small inselberge, the distant flats would seem an immense expanse of level land to the people accustomed to the complete dissection of the upper Jimi River Valley. The trail that we followed today included several entries deep into the valleys of streams tributary to the Jimi, then steep climbs out and around the intervening ridges. Except above an elevation of 5,000 to 6,000 feet, the ridges were grass, while the bottoms and lower slopes of the valleys were forested. Aside from one small terraced garden planted in the grassland, all the gardens had been cleared from the forested areas. In several places the usually earthen trail was covered with prismatic needles of grey shale, the products of the weathering of Cretaceous bedrock (Dow and Decker, 1963). Crops planted in this seeming stone pile were growing well; in fact, the local carriers praised this 'soil' as fertile. Such a stony texture would act to maintain a structural looseness in the ground and would also serve as a moisture-preserving mulch, which would hardly seem necessary where there is almost daily rainfall. Another agricultural feature of interest was the presence here on a small scale of a crude system of irrigation for taro (Colocasia esculenta). To my knowledge, no irrigation occurs in the Jimi Valley east of this spot, although there are instances of taro irrigation in other parts of New Guinea. In this

part of the Jimi Valley the feature is rare, and much Colocasia is grown mixed with other crops without irrigation.

Along the upper parts of the tributaries, waterfalls and rapids were common, and the falling or rushing water was a pleasant refreshment to us after the steep trails. Always -- except during, and for a short time after, rains -- the waters of the streams are clear, a manifestation that only a slight amount of accelerated erosion is present. Perhaps erosion by running water causes less denudation of the slopes than does the mass wasting so palpable in the scars of landslides, which are common in both grassland and forest and seem especially prevalent where the bedrock is shale.

The Gondomben haus kiap is perched on a narrow ridge at an elevation of 6,000 feet. In the early evening a squally downslope wind penetrated the walls of woven bamboo and threatened to blow off the roof of grass thatch. Shortly thereafter came thunder and rain. When the storm had lessened, it was possible to look far below toward the Jimi Flats, now completely hidden beneath a layer of cloud or fog, which was probably the result of the drainage of cool air from the mountain slopes. As usual, once it was dark our camp was quiet, for at night few local people stayed near the patrol, though during the day a crowd was assembled at each haus kiap to watch our passage. From Gondomben, messages were sent ahead to the vicinities of the haus kiap of Waim and Tsarap telling the people of our coming on the following day.

April 11: Gondomben Haus Kiap (6,000') to Tsarap Haus Kiap (5,500').

In the early morning the Jimi Flats were still hidden by a stratum of cloud a few hundred feet thick. During the two-hour walk to Waim haus kiap, the cloud gradually ascended the valley walls until by mid-morning the valleys were clear, and cloud remained only near the crest of the range. The sinuous trail continued to lead us alternately

from forest to grass as we moved from valley bottoms to mid-slopes and spur crests and back again. At one place we passed a neatly squared garden of peanuts planted by an enterprising tul tul who had obtained the seed at Kondembiam several months before when an agricultural officer had given a demonstration of the method of planting the new crop in squares drained by intersecting ditches -- an agricultural practice unknown here. In the past the Administration suggested peanuts as a commercial crop that might be grown by the natives, but the relatively low return for the labour discouraged the native planters; now the planting of peanuts is encouraged only to improve the protein-deficient native diet.

At Waim haus kiap about 120 men were present, some from nearby, some from Gondomben, and some from communities down-slope near the Jimi River. From this assembly the kiap selected sixty permanent carriers, because beyond the next haus kiap, the patrol would enter the relatively uncontrolled area where there would be little possibility of obtaining a new set of carriers for each day's journey. Moreover, if any of the peoples of the uncontrolled area were to be hostile, they would be unlikely to attack a patrol consisting of such a large body of aliens. Unlike the groups of men who had so far carried the patrol's supplies for the short distances between each haus kiap, the permanent carriers would be given payment: one Australian shilling a day, food, and a ration of tobacco.

West of Waim the lower spurs and the slopes of the tributary valleys were almost continuous grassland in which were scattered a few burned patches, an occasional terraced garden, or the remnants of the crude earthen terraces still visible beneath the colonizing grass. But most of the gardens were planted in the high forested part of the land. The extensive grasslands of this area would suggest a longer occupation and a more intense use of the land for agriculture than has occurred in

the more heavily forested areas of the upper Jimi Valley or the Simbai Valley to the north. Some of the characteristics of agriculture here are also different from those of these nearby areas: Colocasia is often planted almost alone with only a slight admixture of other crops; some gardens consist entirely of bananas and the two edible Saccharum species, S. edule and S. officinarum; terracing and irrigation are present, though far from universal; casuarina trees are widely planted as a fallow cover; and grasslands -- usually those that were dominated by Miscanthus -- are occasionally used for agriculture. The orderly quality of the gardens is suggestive of contact with the sophisticated horticulturalists of the Central Highlands; but, the people of the upper Jimi Valley have equal or better opportunities for such contact (Strathern, 1965:134) and are more closely related linguistically to the Central Highlanders (Wurm, 1964). Perhaps the similarities between the agriculture here and in the Central Highlands are the result not of ease of flow of information, but of a like intensity of population pressure and an extensiveness of grassland not present in the areas with a seemingly more casual agriculture. That is, the native horticulturalists utilize the land intensively and employ elaborate techniques only if necessary. For example, in the nearby Simbai Valley there are some groups with access to almost unlimited areas of forest who practice none of the methods mentioned above, but who nonetheless know of at least some of them, such as planting casuarinas in the abandoned gardens. 'But why', they ask, 'should we plant casuarinas when our ground is good without them.'

The patrol spent the night at Tsarap haus kiap, the last of the chain of recognized haus kiap along this slope of the Bismarcks. Beyond, to the west, there are no registered tul tuls or luluais, and there has been no permanent contact between the natives and the Administration or the Missions. Even at Tsarap there has been little

response as yet to the medical aid post, although the people requested that it be established and have helped the Aid Post Orderly to construct his small, but attractive, bamboo and grass buildings.⁹ Because they had known in advance of our coming, the local people had brought to the haus kiap considerable amounts of food, mostly sweet potatoes, pumpkins, sugar cane, and the edible leaves of Hibiscus manihot. This produce which the kiap purchased with salt, face paint, beads, and other trade goods, was distributed to the permanent carriers. Later in the journey where the local people were not expected to supply food in sufficient quantity to feed the patrol, the carriers would eat the rice and tinned meat that was included in the patrol's cargo.

April 12: Tsarap Haus Kiap (5,500') to Meren (4,600').

As we left Tsarap, we could see Meren, the day's destination, on a spur a few miles away directly westward. To reach it, we turned northward into the deeply re-entrant valley of Kaiment Creek and walked for three hours along the good government walking track, which was lined with decorative plantings of Cordyline, Cassia, and other shrubs with bright leaves or flowers. At one spot beside the track there was a device of Cordyline leaves tied to the stump of a tree fern; its purpose was said to be to frighten away ancestral spirits who had been throwing rocks at the roof of a nearby house. A little beyond this place the graded track, which extends here from the Jimi River Patrol Post, ended, to be replaced by a rough native trail cleared more by use than design. In the forest it consisted of mud and the roots of trees; at times it tunnelled through secondary thickets of sprawling ferns and a Piper species; beside it in place of the planted decoratives were occasional patches of trailside weeds, such as Paspalum conjugatum and a brightly flowering Impatiens species. Several taro gardens divided into log-lined terraces were present near the trail, and traces of terraces were

numerous in the grasslands. Only a few houses were seen, and these were of a style different from the dwellings to the east -- longer, higher, and with a turtle-back roof. One exceptionally large building, which had the humped roof but no walls, was said to be used for ritual dances, events that, to the east, occur in the open air.

While still at Tsarap, the kiap had sent a message to Meren, instructing the local people to assemble for a census and medical treatment. Reputedly, only two persons out of a group of 116 did not appear. On the kiap's previous visit only sixty-four people had shown themselves; the rest had remained hidden in the forest, afraid and angry. Always during the initial stages of contact, the natives are urged to appear for the censuses, but there is no penalty for absence; later, apprehended absentees may receive short jail sentences. When the patrol first arrived at Meren, many people, especially the women, remained sitting on the ground in clusters with their backs to us. But as the patrol members proceeded to establish camp, raise the Australian flag, and prepare the census books and medical equipment, the people warmed and seemed glad to come forward to greet us by shaking hands, yodelling, and stamping their feet.

These are a short people -- described as pygmies by the first patrol officer into the area -- but sturdy in appearance. Their dress is similar to that found throughout the Central Highlands and surrounding mountains. The women wear aprons of hanging strings made from the pithy underbark of several species of trees. Most of the men wear aprons of leaves or woven string held by a belt of bark or woven plant fibres. A few men have replaced the native apparel with loin-cloths of trade cloth. Many of the men and women completely cover their large growths of hair with bark cloth, coloured with a red dye made from the fruits of a Pandanus species or Bixa orellana. Often, adornments of flowers, leaves, feathers, or fur are added to the head-

dresses.

Since the kiap's last visit to Meren eight months before, the people there had built a bamboo and grass haus kiap and had cleared and fenced the area surrounding it -- work that made manifest the persuasiveness of the tul tul who was appointed provisionally on the earlier visit. Now the kiap asked this tul tul if he would accompany the patrol until its return to the Patrol Post. Then, if willing, he would be flown with other new appointees to the highland town of Mt Hagen, certified as a tul tul by the District Officer, returned to the Patrol Post, and -- escorted by a policeman trained to lay out roads -- sent home with several shovels and instructions to lead his people in the extension of the government tracks. His exposure to neighbouring groups, the Patrol Post, and Mt Hagen, is intended to lend him authority among his people and to give him a notion of the world outside his own part of the Jimi Valley. He will never before have made such a long journey, physically or spiritually; and we can never know its complete meaning to him, but because of his lack of knowledge of the western world and its means of production, he will unavoidably misinterpret some of what he sees. The resultant plexus of fragmentary knowledge, confused rationalizations, and unfulfilled desires have often, elsewhere in New Guinea, given rise to 'cargo cults'. To the present time such movements have not been pronounced in the Jimi Valley or the adjacent mountain valleys to the north, but there is evidence of their covert existence.¹⁰

With its arrival at Meren, the patrol had entered the region where its important work would begin. The pattern of contact would be the same for all the groups along our route: the kiap would tell of the Administration's goals and describe the benefits that would be available to the people following their acceptance of government and mission activity; a census would be conducted if enough local people appeared; all the people present would receive anti-yaws shots of penicillin; and

food brought to our camp by the local people would be purchased at what was hoped to be an endearing rate of exchange -- tubers, greens, fruits, and sugar cane for salt, matches, beads, face paint, mirrors, and the coveted bush knives and steel axe blades. At Meren, as elsewhere, once each family had appeared before the kiap for census enumeration, one record, or 'Village Register', was left in the care of the provisional tul tul, who was instructed to guard the 'book' well until the kiap's next visit. During the interval, the registers stay wrapped in leaves tucked somewhere under a smoke-darkened roof support, but they are rarely lost. Their existence in the community, which knows that somehow the register holds their names, provides a physical tie to the Administration.

When the tasks of the day were done, the kiap ordered the flag lowered, and while he and the husky native police stood at attention, the people of Meren watched in silence -- not knowing the meaning of the ritual but seeming to be respectful. As has often been noted by patrol officers engaged in establishing contact, it is surprising that the New Guineans, with the exception of a few notably pugnacious groups, such as the Kakukuku, so easily and quickly accept the authority of the Administration. At Meren, for example, one kiap who is usually three-to-four-days distant up the valley has, with a few visits, ended the generations-old custom of warfare and induced the people to build and care for a haus kiap, attend the census, and receive alien medical treatment. Many explanations have been given for this remarkable tractability. Some officials believe simply that the natives, as practical people, realize the superiority of rifles to bows. Others believe that the New Guineans, very frequently described as a materialistic people, think that they will obtain the desired goods more quickly by cooperation than by hostility. Another factor is the antagonism traditional between neighbouring populations, a facet of

social organization that made impossible the development of any united resistance to European penetration. Finally, it could be that the docility of the people is in part illusory: they may not feel as 'controlled' as the Administration would like to think. Most New Guinean groups are used to being temporarily subdued by superior force, but as R. Berndt (1957:413) suggests, it may be that they '... cannot envisage being completely and permanently under the control of an alien power, however strong it may appear at the moment.' Now, because they are a pragmatic people and are inferior in strength to the Administration, they obey but perhaps do not absorb the kiap's injunctions. What will happen in not-long-contacted areas if the Australians soon leave the Territory was perhaps foreshadowed by the ease with which the groups near Kainantu in the Highlands returned to their traditional ways when Administration control was withdrawn during World War II (C. Berndt, 1953:113).

April 13: Meren (4,600') to Benjem (3,600').

In the morning fog we departed from Meren on a rough trail, wet from a four-hour rain of the night before. After an initial descent through forest to a small stream, the trail led up a long slope covered with a variety of vegetation types: tall forest that might have been primary, groves of tree ferns half hidden by a tangled understorey of grasses, an untended orchard of Pandanus, and open grasslands that were in part the three-to-four-foot high Imperata cylindrica and Themeda maxima that grows in clumps ten to twelve feet high. By mid-morning the clouds were gone, and on the ridge-top grasslands the bright heat came both from the sun's rays directly and upwards from the ground and grass. All our bodies shone with perspiration, and whenever we stopped to rest, swarms of 'sweat bees' (a small, stingless bee) settled quickly to crawl on our wet skin. It was recurrently pleasant to pass into the

coolness of one of the forest groves that rose here and there in the grasslands. Once we heard the whistled note, abruptly repeated, of a bird-of-paradise and glimpsed a flash of yellow high in the foliage. So as not to offend the local people, the kiap quickly cautioned the patrol members not to try to shoot the bird, whose feathers are highly valued for use in ornamental headdresses. Even in an unoccupied area, a bordering people will usually feel that they have hunting rights, and in pre-contact times skirmishes were often fought between neighbouring groups because of what was considered trespass on the part of one into the hunting territory of the other. In another grove the native guides cautioned us to avoid a grass-covered, ten-foot-deep pit, which had been dug with wooden dibbles as a trap for wild pigs that also used the narrow path on which we walked.

At Benjem, the next provisional haus kiap west of Meren, the patrol officer was pleased to find that the tentative tul tul, who was called Wolibi, had successfully urged his people to maintain in good condition the rest house that had been built on the previous patrol eight months before. Fifty-four members of the Taun clan -- ten more than had appeared before -- greeted us with enthusiasm and accepted without protest the speech of the kiap, the census taking, and the penicillin injections. Wolibi said that all of the Taun clan were present except for one woman and her four children who had remained sick in their house. The Cadet Patrol Officer, a policeman, and the Medical Assistant were sent to investigate and discovered that all the missing group had yaws. None of the people present at the census had this marring disease, but some were suffering from tinea and infected scabies, which, while not serious maladies, are disturbing to the New Guineans, who consider the condition of the skin as an important criterion of beauty and well being. At dances young men and women are mutually admired for their shining oil- or grease-covered bodies; and internal illnesses may be

described as a state wherein the skin has turned bad. Because of this bias, the kiap, in his talks, always stressed as a benefit of the Administration's presence the medicines that would make the skin beautiful.

At Benjem the Taun told us of two other groups who had not yet appeared before the kiap. One, called the Gonjembain, lived between Meren and Benjem, but close to the Jimi River, far down the slope from the route followed by the patrol. As the Taun said that this group was small in number and had not recently attacked any of their neighbours, the kiap decided not to seek them out on this patrol. Probably when they learn of the medical treatment and the trade goods that the Taun received, they will show themselves of their own accord when the next patrol visits Benjem. If they do not, then their territory will be visited, for it is important to avoid leaving within a nominally controlled area any uncontacted peoples who might prey on their neighbours to whom warfare has been forbidden. The other group not yet contacted were said to live downstream from Benjem on Kinent Creek somewhere near its confluence with the Kaironk River, one of the Jimi's major tributaries. Tul tul Wolibi appointed a young Taun man to deliver to these people the kiap's message that on the next day the patrol would proceed down Kinent Creek to meet with them. The messenger set forth, but reluctantly -- perhaps because he hated to leave the excitement of our camp, perhaps because he was afraid of the people downstream. Wolibi said that the Taun neither fought nor intermarried with this group; but often during the kiap's earliest visits the people deny having battled or having any connection with other groups, probably because they fear that the kiap's proscription against future wars implies a punishment for past battles.

The Taun had collected from their gardens a considerable amount of food for the patrol. Colocasia of several varieties predominated:

some tubers were small and round, some were long and white and weighed several pounds, others, also large, had a pinkish flesh, ... Xanthosoma was next in abundance, followed by several varieties of sweet potatoes, and in lesser amounts, sharp-angled green bananas for cooking, and several kinds of edible leaves. After the food was purchased with trade goods and distributed to the carriers, the preparations for the evening meal began. Several holes were dug to make earth ovens; numerous fires were started to heat the rocks, which, when hot, were placed in the leaf-lined ovens together with the tubers and greens. The ovens were then sealed by weighting down with rocks the Heliconia and banana leaves that had been folded over the top of the food in the pit. After an hour or two the steamed food was ready and the ovens were opened, releasing their appetizing vapours. Around each pit squatted several carriers and local natives, but not at random, for the people here feel that it is important to use a different fire from that used by a member of a traditionally hostile group. To violate this taboo might lead to serious illness. After the meal was over, the coals of the many fires dimly lit the faces of the encircling men, who related -- sometimes talking, sometimes singing -- the events of the day or of days past or of what might be tomorrow.

April 14: Benjem (3,600') to a forest camp on Kinent Creek (2,500').

The morning meals were always hurriedly prepared and eaten. The carriers either roasted tubers and bananas in the fires or else ate food cooked the night before in earth ovens and stored overnight in gourds or segments of bamboo. After the noisy, but now fairly efficient, loading of supplies, we left Benjem on a trail that led westward along the north side of the valley of Kinent Creek. An hour's walk through old gardens and patches of secondary forest brought us to a fenced homestead of two rectangular houses and a small household garden of

bananas, the two kinds of taros, and a decorative Coleus with yellow leaves. Beside the garden was a circle of upright, ten-foot high planks supporting a platform on which lay a child's skull. Leaving the corpse to rot on a platform was the common practice throughout this region; now where the kiap and the Aid Post Orderlies have influence, burial shortly after death has become usual. Outside the fenced enclosure was a low, round shelter of wood where the family's larger pigs stayed at night, for here -- unlike the area to the east -- only the small pigs sleep inside the houses.

Beyond this settlement we followed a narrow, slippery trail into a jungle of sprawling ferns, grasses, and weedy trees of Piper and Alphitonia spp. After a short but difficult walk in this dense growth, we came to a small stream where the trail ended. From here, if they want to journey westward, the local people descend along this steep stream to the Kinent and follow the course of the river. But, as the stream bed was too boulder-strewn for our burdened carriers to manage, we began to cut a new trail through the old secondary forest that extended westward from the stream. After an hour's slow movement, we emerged beside a fenced clearing that contained a single house of a style quite unlike any seen before. It was circular in plan with a diameter of twenty-four feet and a centre pole about ten feet high from which the conical roof sloped down to a four-foot high outer wall made of horizontally placed planks and Pandanus leaves. Inside, the house was divided into a circular outer corridor with several openings to the out-of-doors and an inner round chamber built about the centre pole. These two parts were separated from each other by a wall of planks and Pandanus leaves; the single small passageway through the wall to the inner chamber was closed with an obstruction of short planks. No one was home to greet us, but according to the Taun tul tul and guides, the house was occupied by several men and women -- a residential association

of the sexes unlike the segregation usually practised to the east. Probably the house was occupied by several agnates and their associated women. The outer corridor was divided by planks into segments, each with a fire pit, sleeping mats on the earth floor, and a passageway to the outside. The dark inner chamber had a low platform but no fire pit. Although to my knowledge houses with a circular floor plan do not occur in the Jimi Valley to the east of Kinent Creek or in the adjacent Simbai Valley, they are present in other more distant parts of New Guinea. Meiser (1937) reports for the Mt Hagen area a circular men's house, which, however, lacked an inner room; and to judge from Blackwood's (1939) description, some of the Kukukuku houses in the far east of the Central Highlands were very similar to the house near Kinent Creek.

Shortly west of this house, we entered, still cutting our own trail, what looked like primary rainforest. For well over an hour we walked among the tall and often buttressed trees; occasional glimpses of the slope on the opposite side of the valley gave no indication of habitation. Suddenly word passed along the line of the patrol that the guides ahead had met a boy of the uncontacted group who said that other members of his family were coming toward the patrol. We waited and after twenty minutes heard a baby's crying, and down the slope came two women, a boy about seven, two younger children, and the baby in a string net bag on the back of one of the women. They all acted withdrawn but sat down on the forest floor where the kiap indicated. Two interpreters were needed to speak with them: one from the Patrol Post who translated from Pidgin-English into Wolibi's tongue, and Wolibi who could speak the language of the uncontacted people. Where were the women's husbands? Hunting, they said. Were there any other people who lived in this area? No, they said, just themselves. Then, to quiet the crying baby, the woman lifted it from the net bag and gave it her breast. The questioning continued. Had they ever before seen any outsiders like ourselves? No,

they had not. Where had they lived before they were married? They had always been here, they said. After asking a few more questions, the kiap gave the women a bush knife, spoke to them of the benefits and good intentions of the government, and urged them to come with their husbands to Benjem when next they heard that a kiap was there. Then the little group departed among the trees, and we proceeded on toward the west.

Along our route there were no gardens or any forest that appeared to be other than primary, but we did pass a water-filled pit, the purpose of which was said to be to soak the bitterness from the edible seeds of a forest tree. At an elevation of 2,800 feet we saw a sago palm, which is a staple food source in parts of lowland New Guinea but is not utilized here. As we moved westward, the valley's sides became ever steeper, so that we were finally forced to descend to Kinent Creek through a forest undergrown with thorny rattan palms and spiny bamboos. Although the creek had occasional rapids, its boulder-strewn floor provided a better passageway than the slopes above. We waded for two hours along its winding course before finding a suitable place to camp: a level meander neck twenty feet up a steep bank above the water. The decaying remnants of a small shelter and a pile of fire-blackened rocks gave evidence of past occupation, but probably these signs resulted from a temporary hunting camp, not a permanent habitation. The carriers, skilled with axes, quickly cleared a space in the forest and yodelled with delight at the tearing fall of each vine-encumbered tree. As it was raining heavily, the tents and the shelters of poles and leaves were quickly erected, and in the wet dusk the carriers were given sticks of tobacco and a ration of rice, margarine, and tinned meat for their evening and morning meals.

April 15: Kinent Creek Camp (2,500') to Mumil Creek Camp (4,400').

In the morning we could see only a deeply overcast sky in the clearing above our camp. Because it had rained much of the night before and Kinent Creek was running too high to walk in, there was much talk about the trouble that we might have in trying to cross the Kaironk River later in the day. As we began our walk toward the river, a man whose home place was never clearly determined, appeared out of the forest and indicated that he would guide us. Following him, we clambered along the steep south side of the valley of Kinent Creek where there were still no indications of habitation, an emptiness that was not surprising at this low elevation. The canopy of the forest was almost continuous; many of the trees were over 100 feet high; lianas, climbing palms, and sprawling bamboo were common; herbs and lycopods covered much of the ground.

After an hour we descended from the valley side and crossed Kinent Creek at a broad sandy ford where the water was thigh-deep and swift; then we turned northwestward toward the Kaironk River. Before long we saw its roaring flow, some sixty to seventy feet wide and obviously unfordable. We followed the bank of the river upstream in the hope of getting above some of the heavily flowing tributaries or of finding a spot suitable for a bridge. After half an hour we saw rising from near the middle of the river a boulder that offered a substantial base for a bridge. The first trees felled were swept away by the torrent, but after two hours of work mostly by the policemen, a V-shaped but passable causeway of logs and lianas spanned the river.

The elevation where we crossed the Kaironk was about 2,300 feet. Beyond the river, after climbing a steep slope through primary forest in which were scattered some emergent Araucaria, we entered secondary forest at an elevation of about 3,000 feet and soon came to a recently planted garden where a man was pulling out Blumea balsamifera D.C., a

common weed that appears in extensive masses in young gardens. He greeted us with a smile and shook hands in the fashion here: one person puts his closed forefinger between the closed first two fingers of the other person's hand, then the two hands are jerked apart in an attempt to make a loud and satisfying snap. From the front of this man's fibre belt hung the common woven string apron, but his buttocks were bare, an exposure that the police and the carriers from the east thought an indication of true savagery. Near the garden in the shadow of a lean-to shelter sat two other people and a small, prick-eared native dog; they watched our passage but did not come forward.

We continued climbing through secondary forest until we reached a grassy ridge from which we could look back and see that the valley of lower Kinent Creek was almost all forest, while the higher valleys to the north -- both east and west of the Kaironk River -- had many gardens, houses, and patches of grassland. At an elevation of about 4,400 feet we came to a small level area suitable for a camp. After the tents were put up and shelters of poles and grass were built by the carriers, a few local people appeared; the kiap told them that he would spend the following day in this place and would like to see all the inhabitants of the locality, which, in the census books, is named for nearby Mumil Creek.

April 16: In camp, Mumil Creek (4,400').

The presence of a kiap and the procedures of a census were not completely strange to the people here, for a previous kiap -- arriving by a route different from the one that we had followed -- had camped here a year and a half before and conducted the initial census. He had also arrested two adolescent boys charged with killing a woman because they wanted -- or so the intricate story was told -- to avenge another woman's murder, the cause of which was related to still another death

that was the result of sorcery. The boys had spent several months at the Patrol Post, and as they had learned there the language of one of the patrol's interpreters, they were now called upon to serve as part of the chain of translation between the kiap and the people of Mumil Creek. Because the people here were somewhat accustomed to a kiap's invasion of their territory, they appeared today in greater numbers than before -- about 180 in all, apparently divided into three exogamous groups. The census and the injections of penicillin took much of the day, because small family groups continued to arrive at the camp until nearly evening. When a large crowd was present, the kiap iterated his remarks about the benefits to be obtained from the government's presence. Then -- because after the kiap's visit of a year and a half before there had been a battle as a result of a skirmish that had developed from the series of killings already described -- the kiap stressed the Administration's power and determination to end warfare. Even if the people understood the first kiap's injunctions against war, they probably considered that his patrol was no more than a group of strange men passing through, never to return. Moreover, they felt isolated from the Patrol Post by the barriers of space and several languages and thought that the kiap would never hear of the war. At the end of his talk the kiap told the people that he or another kiap would return soon, and that the people should build a haus kiap on the site of the present camp -- permission to use that ground having been obtained from the avowed owner. The job of supervising the construction was given to the two young murderers, who had become familiar with the structure of haus kiap while they were prisoners at the Patrol Post.

Grassland, which was uncultivated, covered twenty to thirty percent of the area in the vicinity of Mumil Creek. Mostly it was on the north-facing slopes; common grass species were Ophiurus exaltatus, Themeda australia, Imperata cylindrica, and an Eulalia sp.; a few

scattered trees of Cassia bartoni rose above the grasses, and also present were many seedlings of the pioneering shrub Melastoma malabathricum and several species of ferns and forbs, including Pouzolzia hirta. Most of the houses and gardens were on the south-facing slopes, which were mostly forested. On some old garden sites among the diversified secondary vegetation there were strikingly uniform growths of Albizzia sp., a pioneering leguminous tree that the natives say enriches the soil. Compared with those near the Patrol Post, most of the gardens here had a limited intermixture of crops. One garden visited was dominated by Colocasia and bananas with only a sparse scattering of a few other crops. Colocasia predominated among the food brought into our camp; bananas were second in importance; sweet potatoes, manioc, yams, and Xanthosoma were present but not abundant. The taro tubers were all large but of two distinct forms; one was globular with a six-inch diameter, the other was ten to twelve inches long. None of the sweet potatoes weighed more than a few ounces, unlike those grown in some places in the upper Jimi Valley where the weights of single roots commonly exceed a pound. Probably this difference of size of sweet potatoes in the two places is the result not of a difference in the soil or climate but of a difference in the varieties of the crop.

Here, as is true throughout the Jimi River Valley, the gardens were often located on slopes as steep as thirty-five to forty degrees, but the houses were built on the small, gently sloping benches that occurred intermittently on most of the spurs. The houses were of the same circular form as the house on Kinent Creek. One that was visited was twenty-six feet in diameter and had a centre pole fourteen feet tall. The outer corridor was divided into four segments, one occupied by a single man, another by two men, another by a man and his wife, and the fourth by two pigs. The interior round room was used as a sleeping

place by a single man. The walls of the house were made of planks and Pandanus leaves, the roof was thatched with large bamboo leaves, and the top of the centre pole was capped with a decorative series of the large white egg shells of a bush fowl (Aepyodius or Talegalla sp.). On the interior walls and the roof were hung more decorations and belongings, including a collection of jaws of phalangers or bandicoots, bows of palm wood, arrows with shafts of Miscanthus culms and blades of bamboo or points of hardwood, leaf-wrapped bundles of tobacco, and a small wooden drum of hour-glass form.

The clothing and adornments of the people were not unusual. Both men and women wore string aprons in front; all of the women wore a covering of strips of bark over their buttocks, while some of the men wore leaves and other men went bare. Many of the people wore hair coverings of bark cloth, and many of the men wore armbands woven of strands of fibre from the Calamus palm. One man had marked a pattern on his face with Bixa orellana, and had daubed grey clay on his arms and thighs so as to form a series of chevrons-decorations that were said to have no meaning other than self-beautification.

April 17: Mumil Creek Camp (4,400') to Barenjep Camp (3,500').

During the census at Mumil Creek the kiap had appointed a fully bearded man of at least forty years of age as provisional tul tul. At the time, the appointee seemed quite disconcerted at the thought of accompanying the patrol back to the Patrol Post. There was soon to be a ritual dance, he said, and it was not right that he should miss it. But after a night of thought and what appeared to be the persistent urging of several younger clansmen, he agreed to go, along with three of the younger men, who, over the night, had discarded their turbans of bark and cut their hair quite short. Such adoptions of new styles are common with the coming of the police and the kiaps, whether the changes have been suggested or not. Often the men and women of a

community will cut their hair after initial contact because 'short hair is the kiap's way' and because they may believe that imitation of the kiap is a quick route to the new goods and the 'new life' that they are beginning to hear so much about. Whatever their reasons, their willingness to adopt new ways is -- at least on the surface of things -- of help to missionaries and administrators whose intent is to change the life of the natives. However, as elsewhere, the young may be more eager to change than the old; and the new tul tul, though willing to go with us, still retained his hair in the traditional style and carried with him a large stalk of bananas because he feared that the evening's camp would be in enemy territory where the local food would be taboo to him.

After we left camp we climbed up a grassy ridge and into the forest that covered the drainage divide between Mumil Creek and the next stream to the west. On the other side of the col, which had an elevation of about 4,600 feet, we descended from the forest and found ourselves again in a settled area. The houses that we passed were still of the circular type with the conical roof; at one homestead the house was set idyllically in a small grove of breadfruit trees. The gardens too were similar to those near Mumil Creek. In one well fenced plot the surface was covered with Colocasia interspersed with Saccharum edule. In another, older garden, whose fence had rotted, there were now only weeds and a few banana plants, a crop that may still be harvested long after the other garden plants have been abandoned. One variety of banana with fruit fourteen inches long excited comment from the carriers, who said that none of the many varieties of Musa at their homes were so large. As we continued to descend, following and often walking in a stream, we passed into an area with little population. Fallen trees, landslides, and steep slopes made passage difficult: to move a distance of less than two miles took six hours. Finally we left

the valley bottom, ascended a narrow spur, and established camp in the forest at a place called Barenjep.

From Barenjep there was an extensive view to the south of the Jimi Flats. Some eight miles away in a large grassy area near the middle of the Flats we could see a cleared rectangle that is to be an airstrip large enough for DC-3's. This strip, which is being built at a place called Ruti, is intended to serve a large tract of land that the Administration plans to buy from the native claimants, a small group of about sixty people who are the only occupants of a vast expanse of level land. After the land has been obtained and the Ruti people have resettled with an allied group in the mountains, the Administration plans to open some of the Flats to Europeans for the development of stock raising and plantations of tropical crops, perhaps sugar or rubber.¹¹ Other parts of the Flats may be used to settle colonies of natives from the crowded highland valleys near Mt Hagen and Wabag. The project is an ambitious one and in accord with Australia's efforts to develop New Guinea, but the conditions -- whatever they may be -- that have limited native use of these invitingly empty lowlands may also affect the Europeans and natives from other areas. Because the rivers are deeply incised below the surface of the Flats, there would appear to be little rejuvenating alluviation of the soil. And, as the Flats are at an elevation of about 1,500 feet, the diseases, insects, and poisonous reptiles of the lowlands are present. Reputedly, Ruti's inhabitants are an unhealthy people; certainly the mountain people are united in their opinion that the Flats are an unhealthy place to visit.

At Barenjep the kiap talked with two provisional tul tuls, one from the small group who lived downslope from Barenjep, the other from Wandonk, a place in the territory of the next people to the west. There had been, they said, no battles since the kiap's last visit seven months before when they had been appointed tul tuls. They said further

that a new haus kiap had not been built at Wandonk, because for one thing, there was no thatching material available, and for another, the people refused to help -- a situation that illustrates the unenviable position of the provisional tul tuls. They may convey the kiap's instructions to their people, but until communications are such that the kiap can offer support by sending a policeman, the people may well ignore the tul tuls' directions; and the egalitarianism of most New Guinean societies prohibits persuasion other than rhetoric.

The two tul tuls also brought the news that some of the men near Auremp -- a place that is two days' walk beyond Barenjep -- said that they were waiting to kill the kiap when he came to their territory. Resistance to patrols does occur at times during the initial stages of penetration, but more often than not, threatening declarations prove to be no more than bombastic oratory. Nonetheless, the kiaps must stay alert to potential attacks and also use all diplomacy possible to prevent them. Often, on a first visit to a people, the patrol officer may, as a kind of precautionary illustration, fire a rifle bullet through several shields of planks; but he must be wary of using his rifle against the people, and is officially cautioned to remember always that there is a strict government ordinance against '... resort to force except in cases of necessity when all other means have failed, and that it by no means follows that because an officer has a good defence on a charge of manslaughter that his conduct will, therefore, escape censure.' (Territory of Papua and New Guinea, 1947) And that censure can include criminal liability. As one kiap explained the ordinance: 'It's all right to shoot after you have been killed.'

Punitive expeditions are also against government policy; if a European or native policeman is killed during an attack by a native group, the action is considered as a crime on the part of the individual killer, not as an act of hostility on the part of his people. It is

hardly surprising that during initial penetrations in New Guinea there have been violations of these ideals, but to a remarkable degree they have been observed, and loss of life has been small, both among the invaders and the invaded.

April 18: Barenjep (3,500') to Wandonk (3,000').

After we left the camp at Barenjep, we climbed over the high ridge that separates the streams near Barenjep from the extensive drainage system of the Arami River. All the higher part of the ridge was covered with primary forest. Where we walked, mostly in the deep shade past heavily buttressed trees, there was only a sparse growth of ferns and soft-leafed forbs on the ground; in a few places where the canopy was broken, there was a denser growth of low vegetation, including spiny bamboo, Impatiens sp., Paspalum conjugatum, and Laportea decumana, which is a stinging nettle widely used as medicine in New Guinea. While passing one Laportea plant, the reluctant tul tul from Mumil Creek seized a handful of the attractive white and green leaves and pressed them against his chest. Quite painful, this sensation is said to relieve many psychic and physical ills. Near the top of the ridge we came on another useful plant: a tall palm that had been felled to obtain the edible bud and the spathe, which is used as a protective wrapping for feather decorations and as a container in the making of the sauce from Pandanus seeds.

After crossing the drainage divide we descended from the forest onto a grassy ridge from which we could see much of the route that we would follow for the next several days. The complex form of the land indicated an active and irregular geological history: the total Arami drainage system is made up of several valleys, some broad with gentle slopes, some narrow and deep, and some a combination of gently inclined terraces and steep slopes. Our immediate destination by Wandonk Creek seemed almost directly beneath us at the bottom of a slot at least a

thousand feet below. As elsewhere, the valley bottoms and mountain crests were forested; in between were the gardens, secondary bush, grasslands, and houses -- the last like mushrooms scattered on the distant terraces.

When we reached our camp site at Wandonk Creek, we found that the clearing made during a patrol's visit the previous September had disappeared under a thicket of twelve-foot-high tree saplings and wild bananas. After the police and carriers had removed this growth and set up the camp, a group of eight men and three women appeared. Most of the men were bearded and wore bark turbans; the women wore small caps of bark. All seemed unresponsive or indifferent to our presence. While the kiap talked to them through two interpreters, they sat in a tight group, many with their backs to him, smoked leaf-wrapped cigarettes or chewed betel nut, and talked softly to each other. When the kiap asked where the other people of this area lived, they said that only they lived here. When he said that he had seen forty people before, they replied that the others were in the forest or at home. Some bush knives and other trade goods were distributed, but no census was attempted.

April 19: Wandonk (3,000') to Auremp (4,900').

The only signs of human habitation seen on the two-hour walk from Wandonk Creek to the crossing of the Arami River were a few Pandanus orchards in moist gullies and one small garden. One might have thought that the declivity of this inner valley was too steep even for most New Guinean gardeners, or that the elevation below 3,000 feet deterred use, but on some of the north-facing slopes were patches of grass in the forest, an indication of fairly intensive gardening in the past. At about 2,600 feet we crossed on a slender bridge of poles the swiftly descending Arami River and then from the river's western bank began a

steep ascent. The only dwelling that we passed on the long climb from the river was an abandoned house set in an orchard of Pandanus and breadfruit trees. Sweet potato vines from the household garden covered the surrounding ground, and several stalks of ripe bananas remained unharvested on their plants. The cause of abandonment might have been sickness, either of a person or a pig; when such illness is attributed to sorcery, it is considered wise to move. The form of the house was different from that described for Kinent and Mumil Creeks and the regions to the east. The straight and nearly parallel side walls were about twenty feet long, both ends were rounded. Connected to the outside by a single door at one end, the inside was divided into two chambers by a long wall that stretched almost the length of the house.

Climbing beyond this house we continued through secondary forest and a few old gardens. At one place we had to scramble across a wide jumble of boulders that had fallen from the cliffs above. Spots of permanent seepage among the rocks had been utilized to plant Xanthosoma, which was growing luxuriantly -- seven feet high with leaves two feet wide. Almost 2,000 feet above the river we reached a grassy terrace dotted with fluted outcrops and pedestals of limestone. On the other side of the valley the mountain dome that dominates the Arami drainage system is said to be of the same rock, which is the source for the lime used with the betel nuts. As we walked along this dissected terrace, we passed through a garden that contained a few Areca palms, the source of the betel nuts. The occurrence in this vicinity of betel-chewing is curious, for it is found nowhere else in the Jimi Valley or the adjacent Simbai and Kaironk Valleys, although it is a common custom in parts of the highlands and along much of the coast.

The Auremp camp site was at an elevation of about 4,900 feet. To the east the terrace on which the camp was located fell off steeply into the gorge of the Arami River; to the west and north the terrace ended

against steep ridges. The same site had been used by a patrol the previous September, and the framework of a shelter built then was still standing. Although on the last patrol the kiap had asked the people to complete the house, no further work had been done; but on the other hand, neither had the framework been set afire -- a sign that the threats of an attack were probably not serious. During our first few hours at Auremp, none of the local people appeared, although we could see figures watching us from the ridge top to the north of the camp. Finally, near dusk, three men and a woman appeared. All wore string aprons hanging from belts woven of fibre from a Calamus palm. One of the men, who had been appointed provisional tul tul during the visit of the previous patrol, had reddened his cheeks and nose with Bixa orellana and blackened his forehead with a paste of ashes. His bark turban was adorned with fur from one of the many small, forest-dwelling marsupials, and as a further decoration he had tucked orange-coloured flowers all around his head under the turban. Because three interpreters were necessary for the kiap to speak with the people of Auremp, conversation was slow and communication dubious; but it did seem that the people here were neither hostile to, nor afraid of, the patrol. Rather, they appeared to be impassive or indifferent. As near as could be understood, if anyone had threatened to attack the kiap, it was a man who was considered somewhat crazy and who was now said to have gone into the forest. When the kiap asked why the house had not been completed, the tul tul said that he had been sick. Despite repeated questioning, he would say no more. At the end of the interview -- after the kiap had told the tul tul that tomorrow he would like to see all of the local people -- the three men and the woman disappeared into dark, walking single file on a narrow trail through the grass.

April 20: In camp, Auremp (4,900').

Early in the grey morning the tul tul and two other men presented themselves to the kiap and said that the people were in their gardens collecting food to bring to our camp; we waited for them until early afternoon when a band of fifteen men and women approached across the grassy terrace from the settlements to the north and west. Most of the men were bearded and, except for one old patriarch who wore a net covering on his head, had pounded bark turbans over their large heads of hair. The women wore bark hair coverings too but kept their hair cut much shorter than the men's. Both sexes carried net bags of string. The men, who hung their bags about their necks, used them to hold such personal belongings as tobacco, lime containers made of gourds, betel nuts, small bone tools, and recently acquired steel knives. The women's bags, which lay against their backs suspended from their foreheads, were used to carry heavy loads of food as well as babies. No one had the facial tattoos now common to the east; apparently this type of adornment is learned from the native police and from men who have worked as labourers on coastal plantations. But all the people had decorated themselves somehow: most men had armbands woven of fibre from ferns or Calamus palms; some people had necklaces of trade shells, or segments of the yellow stem of a Dendrobium orchid; a few men had chains of fern-fibre ringlets hanging beside their ears; and, as is common in the parts of New Guinea with little contact, several men and women wore strung about their necks the dried fingers or hands of beloved dead. All the men had steel axes, which passed into this region along native trade routes several years before the first white men entered the area. The older men said that when young they had possessed only stone axes and that one old man who had recently died had never used a steel blade. As near as could be judged, maize -- a common, though recently introduced, crop to the east -- was not present here; but Xanthosoma and tobacco, which are

also New World crops, were grown, although the Xanthosoma had entered the area within the lifetimes of the older men. As food for the patrol, the people brought only sweet potatoes, bananas, and several varieties of sugar cane. Colocasia was present in the gardens, but was less plentiful than at the lower elevations near Mumlil and Kinent Creeks.

As noted on April 12, we saw at some distance in the vicinity of Meren, imposing building with long hump-backed roofs. Now at Auremp there was an opportunity to examine closely what appeared to be similar structures. One dwelling near the patrol's campsite was, in plan, a rectangle with slightly bulging sides about sixty feet long and twenty feet apart. The roof of Pandanus leaves reached a height at its centre of nine feet above the earthen floor and looked like a giant overdeepened tray placed upside down over the low walls, which were also made of Pandanus leaves. The several small doors along the sides and at both ends of the house were closed with planks. When open, these entrances led into the dim interior, which was divided into eight rooms, five of which were segments of a hollow rectangle that enclosed in its centre three rooms completely insulated from the outside. On the floor of each room were planks for sitting and sleeping and at least one fire pit; just visible about the walls and suspended from the roof were a variety of belongings: bananas and taros in loosely woven containers of split bamboo, bows and arrows, wooden shields, a 'bowl' made of a bent-up palm spathe, water containers of the culms of a large bamboo, packages of tobacco leaves, and an eel trap woven of bamboo.

The tenement dwelling house and the adjacent grounds were surrounded by a fence of planks. Part of the enclosure was bare earth, which was littered with rocks used in the earth ovens, discarded Pandanus seeds, chewed quids of betel nut, and dark red splotches of betel chewers' spittle. Also within the enclosure were many plants: Cordyline, Coleus, and several flowering forbs provided decoration and

may have served ritual purposes; food plants included bananas at all stages of development, sugar cane, Colocasia, yams, and an unknown forb with edible leaves. A small tree (Ficus sp.) that had come up spontaneously in the enclosure had been left unweeded because it too had edible leaves. Tobacco plants and four Areca palms provided stimulants. Thus, if necessary because of bad weather or sickness, the needs of the house's occupants could be met for at least a few days without trips to gardens distant from home.

When the group of fifteen people had first arrived at the patrol's camp, they were quiet and withdrawn, but as the kiap talked to them through the cumbersome chain of interpreters and gave out trade goods in exchange for the food they had brought, they became more animated and soon were laughing and talking. Because the day had remained cloudy and cool, they build several small fires so that each person had a place to squat in the warmth. By late afternoon about twenty-four people had gathered at the camp, but the kiap decided that there were still too few for a census. The anti-yaws injections of penicillin were given, although no one was suffering from that disease. All the people who came to the camp seemed in good health; a few had mild cases of tinea, but this condition was less common than at Wandonk or Mumil Creek, probably because of the cooler climate at Auremp's higher elevation. The people remained in the camp until after the flag-lowering ceremony at sunset. As they left for their homes, several of the men promised to go with the patrol the next morning and to accompany the kiap back to the Patrol Post.

April 21: Auremp (4,900') to Tsengapi (6,100').

We walked northward from Auremp along the gently sloping surface into which the Arami River has cut its deep inner valley, which, on this morning, was half filled with fog. The terrace that we were on and its

counterpart across the river were mostly covered with grass and were not cultivated. All the gardens visible had been planted on the steep, forested slopes that rose from the back edge of the terraces; one garden adjacent to a massive landslip was on a slope that approached forty-five degrees. Such sites are selected because the forest soil is held to be better than the soil under grass, the forest is easier to clear than the grass, the good drainage on the slope may benefit crop growth, and the steepness of the slope obviates bending while doing garden work -- a convenience especially favoured by the women, who do most of the weeding and harvesting.

Soon after leaving Auremp, we reached the base of the high resistant ridge that forms the upper end of the lower Arami Valley. At the top of the ridge we found one of the large hump-backed houses, and soon afterwards we passed a pig shed made of planks and Pandanus leaves and divided into four stalls. Moving into the upper Arami Valley, we entered a large zone of primary or old secondary forest in which we passed a circle of short stakes stuck into the ground so as to form a kind of barrel, which was filled with betel nuts. The local men who accompanied the patrol would explain the presence of this container isolated in the forest only by saying that it was the custom to leave the betel nuts there; conceivably the nuts were for the use of forest-dwelling ancestral spirits.

The upper Arami drainage system is an expansive basin with gentler slopes than most of those of the lower valley. The crests of the 6,500-to-7,500-foot-high ridges that ring the basin are covered with montane rainforest in which the useful wild Pandanus trees are common. Primary forest also occurs in places along the river, which flows on a broad bed near the centre of the basin. The zone of cultivation lies between the crest forest and the river, which flows from the basin at an elevation of about 5,000 feet. Only a small part of the relatively sunny centre of the basin has been turned to grassland; but it does seem from edaphic and

botanical evidence that the land is under pressure: much of the secondary forest is of floristically simple types, such as almost pure stands of the weed tree Dodonaea viscosa; and in many of the gardens the dark brown humic layer is gone leaving the reddish clay subsoil exposed at the surface. The frequency of the large houses indicated too that the population of the upper Arami Basin was denser than that of the lower Arami Valley. To judge from aerial surveys and the statements of the Arami people, population density also falls off sharply beyond the Arami Basin to the west where the Schrader Mountains begin to descend toward the great floodplains of the Sepik and Ramu Rivers.

The route that we were following led along the mid-elevation slopes of the basin, then down to and across the river and up the slopes on the other side to our destination at Tsengapi. On the way we came to an abandoned dwelling with a roof that was half decayed. Several shields with incised decorations had been left about the house along with a small, worn steel axe blade of a style not now sold in New Guinea. Probably it was one of the earlier blades to come into this area, most likely from the upper Jimi Valley, whose inhabitants obtained their first steel axe blades from the Central Highlands two to three decades ago. A few yards from the house a skull lay on a funeral platform surrounded by tall Cordyline. Beyond the house, we passed into a natural amphitheatre the slopes of which were covered with gardens or young secondary growth. Some of the distant gardens looked as though they contained an intermixture of crops like many of the gardens to the east, but a one-to-two-acre plot adjacent to our route was distinctive for its homogeneity. Almost solidly planted with sweet potatoes, this garden was divided into several sections by low hedges of Coleus. Only a few widely spaced banana and Colocasia plants broke the regularity; and to western eyes even the fence looked unusually orderly -- it was strongly made of horizontally aligned poles set between upright stakes that were tightly lashed together with plant fibres.

Beyond this garden stood a new house in a clearing of bare red earth. Outside, except for an attached pigpen built of poles, the building looked very like the hump-backed structures already seen; inside, the rooms were fewer and arranged differently than those of the hump-backed houses inspected before, but the feeling of being in a dingy tenement remained the same. Only a few of the dwelling's inhabitants were home; one old man who sat inside by a dying fire acknowledged our attempt to greet him but otherwise remained impassive.

As we left the house, the carriers pointed out the native 'wireless' -- a white speck visible on a slope far across the basin. Later, on close inspection, the white material was seen to be the inner side of the broad base of a leaf of a Crinum sp., a member of the Amaryllis family. In order to signal distant friends or kin, a man fastens several pieces of this leaf to a wooden scaffold; when the white speck is seen, the friends or kin go to find out why the signal device was erected.

While the patrol's members were spread out along the trail down-slope from the new house, there occurred the only overtly hostile act of the entire expedition: a man with an arrow held to his drawn bow leaped from the bush onto the trail in front of some carriers, who dropped their burdens and ran away. When they looked back, the threatener had disappeared. Soon after this anticlimactic event we reached the Arami River, whose flow was shallow enough to ford but rapid enough to make the crossing difficult for the shorter carriers. Near the river were swampy natural grasslands and groves of casuarina trees on sandy flats. Beyond the river, as we climbed the slopes away from the basin's level centre, we entered again the zone of human habitation and passed another garden that was almost purely sweet potatoes. Blocking the entrances of the paths that branched from the trail we followed were strands of grass and small limbs of trees -- barriers that may have been put there to indicate what was the main trail to Tsengapi or may have symbolized 'No Trespassing'.

But no other evidences of unfriendliness occurred; and in the late afternoon after a full day's walk we reached Tsengapi.

April 22 and 23: In camp, Tsengapi (6,100').

Although the Arami Basin is only a two-day walk from the seven-year-old Simbai Patrol Post, it has been little contacted, partly because it lies within the jurisdiction of the distant Jimi River Patrol Post, and partly because it is insulated from Simbai by two high passes and an extensive stretch of high-elevation primary forest. Soon this isolation will end, for Tsengapi, which lies on a long ridge near the centre of the Basin, has been selected as the site of a government medical aid post and a Nazarene Mission settlement with an airstrip. In order to enhance or ensure Tsengapi's future, the patrol spent two days at the inchoate outpost of western influence. During this stay the police and carriers were to build a permanent haus kiap, and it was hoped that the people of the neighbourhood would show themselves.

The total population of the Arami Basin we estimated to be 500 people, divided into at least four named groups. On our first day about fifty people appeared; on the second day another 100 came. All received anti-yaws injections and heard the kiap speak of the Administration's goals and of Tsengapi's future development. Two of the tul tuls who had been provisionally appointed on a previous patrol brought their Village Registers to the kiap, but one of these officials had been unable to induce any of the people of his group to come with him. Caught between his people and the kiap, his situation again illustrates the unenviable position of a tul tul in so isolated an area. But soon a policeman will be stationed at Tsengapi along with the Aid Post Orderly; then the native officials can be backed by government authority, and the local 'big men', or men of influence, will be more disposed to reveal themselves and to accept a position as tul tul or luluai. Another tul tul who had been provisionally appointed never appeared; it was said that he was many

days' walk away to the north, somewhere near the Ramu River. He may have had the habit common to many New Guinean men of travelling extensively to hunt or trade or visit friends and kin; or he may have died since the last visit or have decided or been induced to avoid the kiap.

I measured the height of thirty of the inhabitants of the Arami Basin and found that on the average the men were five feet tall, the women four feet seven inches. The women wore string aprons in front and strips of bark behind; the men wore woven string aprons in front, but many of the older men wore no covering over their buttocks. Pounded bark caps or turbans were common on both sexes. Traditionally, slender bones, such as those from large bats, were used to scratch the scalp without disturbing the hair or bark covering. Where, because of contact, long hair and bark coverings have been forsaken, long-toothed combs carved from wood have become common. Here, as throughout this region, the men had pierced nasal septums, in which they often wore a plug of wood, bamboo, or cassowary quill. Many men and women had 'cat's whiskers' of small stems or straws stuck into the flare of their nostrils. Frequently, the skin over the people's abdomens was scarred from burns received while sleeping close to the fire so as to keep warm during the nightly chill of their high basin. In other ways the cool climate seemed advantageous -- mosquitoes and sweat bees were rare, and tinea was uncommon. As at Auremp, the afternoon cloudiness led the people to sit near a fire. There, or while standing in line awaiting injections, they seemed always to be touching their neighbours -- a foot against a leg, an elbow against a side, a hand on a shoulder -- as though it were important, albeit unconsciously, that a chain of contact run through the group. It seemed too that the sexes mixed here more than in places to the east, where it was my impression that men and women sat separately -- a division that might be a reflection of the residential segregation of

the sexes that is present to the east but is not found in the Arami Basin.

At the end of our two-day stay, a substantial haus kiap had been built, mostly by the carriers and the police, though some of the local people had helped by collecting grass for thatch. Others had co-operated by bringing food, some bananas, but mostly sweet potatoes, none of which weighed more than a few ounces, perhaps because of the cool climate, poor agricultural techniques, or the lack of high-yielding varieties. In the new house will live the Aid Post Orderly and a policeman, whose first task will be to direct the people in the construction of further buildings and the initial work on the airstrip that is to extend along the Tsengapi ridge top. Before long, native evangelists and white missionaries will come to aid in the completion of the airstrip and to establish the Nazarene Mission.

April 24: Tsengapi (6,100') to Salemp Haus Kiap (5,300').

When the patrol left Tsengapi, its work as a 'Patrol of Contact' was done; and the kiap and the Cadet Patrol Officer planned to return to the relatively long-controlled upper Jimi Valley to conduct the annual censuses. The quickest route there from the isolated Arami River Basin was a two-day walk to the Simbai Patrol Post, from where it was only a short distance across the crest of the Bismarck Mountains to the Jimi River Valley. On the first day there was a hard trip to Salemp, the westernmost of the Simbai Patrol Post's haus kiap and the terminus of a vehicular track that extends from Simbai through the eastern Kaironk Valley.

On first leaving, after descending from Tsengapi ridge to the Arami River, we began a long ascent on the eastern side of the Arami Basin to the divide between the drainage systems of the Arami and the Kaironk. Near the comparatively sunny centre of the basin we walked through both secondary forest and large grassy patches in which were few of the species,

such as Themeda, Ophiurus, Arundinella, and Eulalia, that were dominant in the extensive stabilized grasslands present in places to the southeast and that are thought by Robbins (1963:52-53) to compose the grassland communities of areas subject to long biotic interference by human activity. Instead, in the Arami Basin the common grasses were Imperata cylindrica, the gracefully pink-plumed Pennisetum macrothyrsum, and the tall sword grass Miscanthus floridulus, which Robbins (1963:52) believes to be a dominant in one stage of the succession that leads from cleared land back to a forest community. Thus, though the presence of the grasslands and the nature of the secondary forest (v. April 21) indicated some pressure on the land, so far this area has been less altered by man's occupation than some of the areas we had seen before.

At an elevation of 6,500 feet we climbed by a garden that was purely sweet potatoes except for a few scattered stalks of sugar cane; however, because of the absence of terraces, drainage ditches, or turning or mounding of the soil, this garden seemed in some ways more related to the 'messy' intermixed gardens near the Jimi River Patrol Post (v. April 8) than to the turned, mounded, and drained plots of sweet potatoes in the Central Highlands. Above this high garden we entered the forest that extends for some distance on both sides of the pass into the Kaironk Valley. Although the land beneath it is not gardened, this forest has doubtlessly been modified by man on its lower margin. The canopy was only sixty to seventy feet above the ground, and trees with boles over twelve inches in diameter were suspiciously rare for the community to be an unaltered primary forest. And, perhaps because they are encouraged or conserved for their useful parts, several species of Pandanus (P. danckelmannianus K. Schum. and at least two other undetermined species) were so common as to form groves. One of the unidentified species was especially noticeable because of its emergent crown and its giant stilt roots that rose as much as thirty feet to the

main trunk, which ascended another thirty or more feet before beginning to branch. All the wild Pandanus leaves -- some of which are twelve feet long -- are used to wall and roof houses, while only certain species have leaves said to be suitable for weaving into sleeping mats. The stilt roots provide strong posts for house construction; and the natives here eat in a casual way the seeds that grow on some of the high-altitude species, but there is no evidence of the cultivation of any species of 'nut' Pandanus, such as the P. julianettii that is systematically planted in parts of highland New Guinea.

The low-canopied, altered primary forest extended almost to the summit of the pass. An apparent sub-canopy about thirty feet high consisted of saplings, small palms, and scrambling bamboos, which in places grew together thickly enough to make passage difficult. Beneath was a field stratum of scattered forbs and ferns, and on the ground an interrupted layer of moss and lycopods covered ten to twenty percent of the leaf-littered surface. Sporadically occurring lianas, noticeably Freycinetia, twisted up tree trunks, most of which were covered with wet moss. The pervasive colours of the forest were browns and dark greens that coalesced to a sombre mosaic, into which merged the similar hues of the skins and the leaf or string aprons of the native carriers and prospective tul tuls. Only occasionally were there brighter glints, as from the orange or red fruits fallen from Pandanus or Garcinia trees, or from the pale yellow-green leaves of a weedy bamboo that filled spaces opened by windfalls. At an elevation of 7,200 feet, near the summit of the pass, we encountered for the first time a grove of Nothofagus grandis, a giant southern-hemisphere beech that is cut commercially in some of the more accessible parts of highland New Guinea. We stopped to rest, but soon began the steep descent into the Kaironk Valley, for leeches were too numerous to make pleasant any but the shortest pause in the cloud-shaded, wet forest of the col.

About 700 feet below the col we passed from primary into secondary forest from which, after a few hours' walk, we emerged onto a grassy slope with a startling prospect. In the distance to the east lay the open, densely occupied upper Kaironk Valley, its grassy slopes hazy with smoke and dotted with groves of planted casuarinas -- a landscape of human activity and alteration of the earth that was in striking contrast with the forested lands to the west and the extensive, but relatively empty, grasslands of parts of the Jimi Valley to the south. To reach this different world we continued toward Salemp, which lies on its western edge. For more than an hour we crossed a succession of hills and vales, the latter grown with the tall Miscanthus grass and low secondary brush, the former covered with an intermixture of shorter grasses (Eulalia spp., Themeda australis, Sorghum nitidum, and others) that often characterize comparatively dry and degraded sites. Then, hip deep in silty water, we forded a large stream tributary to the Kaironk River and climbed a treeless, grassy slope for 2,000 feet to Salemp where we found what seemed to us an imposing haus kiap and several auxiliary buildings set in a large clearing of trimmed grass hedged by planted shrubs.

April 25: Salemp Haus Kiap (5,300') to Simbai Patrol Post (5,600').

From Salemp we could look down the Kaironk Valley toward our campsite of ten days before at Mumil Creek and beyond to the forested ridges that stretch to the Jimi Flats. Within the next decade or so this unfrequented lower valley, which provides a passageway through the wall of mountains on the north of the Jimi Flats, may be penetrated by a highway designed to connect the seaport of Madang with that part of the Central Highlands near to and west of Mt Hagen, an area that now has access to the coast only by air or by a long and narrow road to Lae over passes that are frequently closed. A study is under way of the feasibility of several alternative routes from the Highlands to Madang; the one through the Kaironk Valley has received consideration partly for topographic reasons

and partly because it could be incorporated with the scheme for the development of the Jimi Flats.

Turning away from these nearly vacant lands, we proceeded into the heavily occupied upper Kaironk Valley along what seemed to us the luxuriously smooth and wide vehicular track that connects Salemp with the Simbai Patrol Post. In the upper Kaironk Valley, primary forest is restricted to a narrow fringe that caps the mountain crests on either side of the valley. On its north-facing, sunnier side, the valley's slopes below the forest were mostly grassland in which were set a few gardens and some groves of casuarinas. The south-facing slopes, which looked somewhat less degraded than those opposite, had more gardens, and along with the planted casuarinas there were patches of spontaneous secondary forest, as well as grasslands. Accelerated erosion was manifest in the Kaironk Valley in gullied grasslands and in the frequent exposure on the surface of the ground of an orange-brown clay that in less populated areas nearby was overlain by dark brown humus.

The environmental evidences of pressure on the land, together with the large numbers of people seen along the road, made the upper Kaironk Valley reminiscent of the crowded Central Highlands -- an impression of similarity that was furthered by the presence of traits characteristic of highland agriculture.¹² Grassland was used for gardens far more than in any of the other territories along our route, and the effort given to tillage was unique: the heavy soil in the gardens was as if plowed, for after the grass was cut and burned, the sod beneath it was inverted by a process of loosening large clods with dibble sticks and then turning and breaking the clods by hand. We passed two garden plots being prepared in this way, one by two men, one by a man and his wife. It was a laborious task compared with the slash-and-burn clearing and dibbling of planting material into unturned soil that is practised by their forest-dwelling neighbours. When questioned about the technique, Kaironk

gardeners agreed that it was hard work, but necessary, because in their territory they had so little soil made fertile or friable by forest regrowth; without the turning and working, they said that the grassland soil would not be productive. They share this awareness of the value of tilling the sod with the 'grasslanders' of the Highlands who, however, also often neatly mound the turned soil -- a still more elaborate technique of garden preparation that is not employed in the Kaironk Valley. As in parts of the Highlands (for example, the Chimbu country described by Brookfield and Brown, 1963), the numerous planted groves of fast-growing casuarina trees help to maintain soil fertility, but the Kaironk natives' primary goal in planting the trees is to secure firewood and timber for houses and garden fences. Some Kaironk gardens contained an intermixture of many crops, but other gardens were all sweet potatoes except for a sparse scattering of Setaria palmifolia, a grass grown for its asparagus-like inner stem. Probably these nearly single-crop gardens were the final phase of a crop rotation that had begun with the intermixed gardens; that is, the same plot is gardened more than once in succession -- another trait of agriculture common in the Highlands but not practised elsewhere in this vicinity. Also present in the Kaironk Valley were crudely irrigated taro gardens and the rudimentary terraces made by placing poles transverse to the slope of the gardens.

That they are a reflection of the relatively high population density (at least 100 persons per square mile) is the simplest explanation for the presence here of the several techniques that permit the practise of a relatively intensive agriculture in an area that is mostly grassland (cf., April 11). If they only made swiddens in the forest, the 3,300-odd people of the upper Kaironk Valley could not feed themselves. But having seen parts of the Highlands, I felt in the Kaironk Valley a sense of déjà vu so strong as to arouse wonder about the nature of the connection between the two places. How recent and

direct could it have been? Some of the Kaironk Valley people say that it is only within the past few generations that they immigrated to their present home from the Simbai Valley to the east. Could they have come not too long before from the crowded Highlands? Because Karam and Kobon, the languages of the people of the upper Kaironk Valley, are believed (Wurm, 1964:79) to be only remotely related to the East New Guinea Highlands Stock (the linguistic stock of microphyllum common to almost all of the people of the Highlands of Australian New Guinea), such a recent movement seems unlikely. But, because they do share many cultural traits, as well as the Karam language, with the people of the upper Simbai Valley, the people of the Kaironk Valley may well have come from there; and now they do seem to be moving westward into sparsely settled lands.

On our few hours' walk from Salemp to the head of the Kaironk Valley, we passed seven substantial haus kiap, each the censusing place for at least 250 people, often many more. Usually some of these had gathered to greet us and to view a kiap other than their own accustomed one from Simbai. Other people were visible in the distance in their gardens or about their houses, which were of the long turtle-back style like those of Tsengapi and Auremp. The largest crowd that we met, a few hundred adults and children, cheered us on and walked briefly beside us along the road near an Anglican school and mission outpost where they had gathered to attend 'Lotu', or Sunday services, conducted by a native evangelist. Near the upper end of the valley the density of population declined, and when we had reached the pass that leads to the Simbai Valley, we were in an uninhabited zone near the lower edge of the primary forest. From there we hurried downward through fog and a steady rain to the Simbai Patrol Post, which lies at one of the few places in the rugged Simbai Valley where there is enough level land to build an airstrip.

Like the Jimi River Post, the Simbai station was founded in the late 1950's, but by forays southward from the lowlands of the Ramu River rather than northward from the Central Highlands. Initially, the station consisted of a few grass huts; now a network of graded paths lined with decorative plantings connect the several clusters of permanent buildings that belong to the Administration or the Anglican Mission or a private trader. Here, before the patrol departed southward across the Bismarck Range, a few days were spent in rest and reorganization of supplies. And here the kiap felt that his work as leader of a Patrol of Contact was over; now he would turn to other, more commonplace, tasks in the relatively long contacted parts of the Jimi Valley.

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FOOTNOTES

1. For example: the crossing of New Guinea at its widest part from the Fly to the Sepik River: in 1927-28 by Karius and Champion (Champion, 1932); the effective discovery by J. Taylor and the prospecting Leahy brothers in the early 1930's of the extensive and densely populated valleys of the Central Highlands (Leahy, 1936; Leahy and Crain, 1937); and the more than year-long march by Taylor and Black from Mt Hagen to the headwaters of the Sepik River in 1938-39 (Taylor, 1940).
2. Haus kiap (sing. and pl.): Pidgin-English for the rest houses built by the natives at the kiap's direction and located at intervals along the government tracks. Their principal purpose is to provide shelter for the kiap and other Administration personnel when they are on patrol; but the houses also act for the people of the surrounding area as a focus for governmental activities and existence.
3. See Brookfield, 1962, for a summary of the agricultural methods practiced in the highlands of New Guinea.
4. Close investigation of the gardens does reveal a tendency of the people to plant the revered yams and Colocasia in the ritually important heart of the garden rather than on the margins.
5. Because this area is slightly south of the equator, the north-facing slopes of course receive somewhat more annual insolation than those facing south; and because the drier season falls during the northern-hemisphere summer, this inequality in the reception of insolation is intensified.
6. The six years' record of rainfall at the Jimi River Patrol Post shows March as the wettest month (16.95 in. aver.) and June as the driest month (4.43 in. aver.); the average annual rainfall is 124.59 in. Most of the Trust Territory of New Guinea has a similar regimen, the drier season coming during the southern-hemisphere winter when southeasterly air movements predominate in New Guinea.
7. In the Trust Territory of New Guinea the tul tuls and luluais are the officials appointed from each community by the kiap. Lacking any real authority, their most important function is to act as intermediaries between the people and the government and to encourage obedience to the kiap's orders concerning such matters as building and maintaining tracks or assembling for a census. Once the people of an area become familiar with European ways and are producing a cash crop, a local government council of elected representatives is instituted. This body -- though still subject to the Administration -- has more autonomous authority than the tul tuls or luluais and is considered to be a step toward self determination and independence.
8. See Wurm (1964) for a recent survey of the languages of the highlands of New Guinea.

9. In order to assure some use and appreciation of the proffered medical facilities, it is the Administration's policy that a local group must ask that an aid post be established, then help the Orderly to build a clinic and living quarters and provide food for him until his own garden is productive.
10. A copious body of literature exists concerning the meaning and origin of these cult movements. The discussions by Lawrence (1964), Worsley (1957), Berndt (1952), and Wallace (1956) cover the matter thoroughly.
11. The natives' rights to land are strictly protected by the Government. Land may be bought only by the Administration, and only when two conditions are met: (1) the native owners must be willing to sell; (2) careful surveys must reveal that the land is surplus to any potential native needs in the near or distant future. At present, the natives, usually as communities, own ninety-seven percent of the land in the Territory of Papua and New Guinea; about one percent is under the control of Europeans, either as freehold or leasehold; the balance of two percent is held by the Administration (International Bank for Reconstruction and Development, 1965:38).
12. See Brookfield (1961; 1962) for an account of the types of agriculture practised in the New Guinea Highlands.

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