

N E W G U I N E A R E S E A R C H

B U L L E T I N



Plate 1. Tommy Kabu

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RABIA CAMP: A PORT MORESBY MIGRANT SETTLEMENT

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Part I

RABIA CAMP AND THE TOMMY KABU MOVEMENT

N.D. Oram

Foreword

Large numbers of rural people in all developing countries are moving to towns in search of a livelihood. The reasons they leave home, the settlement patterns they establish in towns, and the economic attitudes and activities of the settlers can only be fully understood if the home environment is also examined.

Port Moresby, which has a deep natural harbour, was founded in 1884 and is the headquarters of the combined Territory of Papua and New Guinea. Roads reach no more than 70 miles into the sparsely populated hinterland and other parts of the country can therefore only be reached by sea and by air.

The population of Port Moresby was only 2,800 in 1935 but after the second world war it grew rapidly to 15,700 in 1954, 29,000 in 1961 and 42,000 in 1966.

Before the war, Papuans in Port Moresby lived either in villages belonging to two landholding groups (Koita and Motu) or in employers' compounds. In the immediate post-war years, the large influx of migrants, particularly from the Gulf of Papua, built their own houses in ethnic clusters on village land, with the exception of one group who built on government land. In 1964, one-fifth of the Papuan population lived in 22 such settlements (Oram 1964:41).

Port Moresby was the headquarters of the Tommy Kabu movement, an unusual example of organised social change. Its members sought to establish a trading depot and migrant settlement, Rabia¹ Camp, in this urban setting. The influence of this choice of locale on the fortunes of this Purari group, including such factors as the existing system of land rights and the government policies which conditioned the development of a Purari settlement in town, are examined in some detail. In outlining the history of this movement I try to show that it was a part of the general process of social change in the Purari Delta. Previous accounts of the Tommy Kabu movements have not fully examined the extent to which it contained

¹ Rabia means sago in the Motu language which is spoken in a number of villages in the vicinity of Port Moresby, and also in the simplified version, known as Police Motu, which is widely spoken as a lingua franca throughout Papua.

elements of 'cargo cultism' in the sense that members sought to achieve their ends by means which were non-rational in Western terms. The reasons for the failure of the movement also require re-examination, and in this paper I attempt to provide some answer to these problems.

The paper is based on research carried out from 1962 to 1965 in the course of a wider study of the town. Material was obtained from association with Tommy Kabu and members of his movement, and from government officials, documents and published sources. There is now considerable literature on the Purari people: F.E. Williams, government anthropologist, published a general ethnographic account (Williams 1924); and J.H. Holmes, a member of the London Missionary Society, who lived at Urika in the Purari Delta from 1906 to 1920, also produced in the same year a study (Holmes 1924) of the Purari and other peoples living in that area, which is of particular interest because of his knowledge of religion and belief. In 1954 and 1955 an anthropologist, Robert F. Maher, carried out a study of culture change in the Purari Delta, the results of which were published in Maher 1961. In 1951 the South Pacific Commission published as its Social Development Notes No.7 an account of a community development project in the Purari Delta which was begun in that year. The papers include a valuable account (Allen 1951) of the 'Purari Kompani' by the late Rev. L.W. Allen of the London Missionary Society, who was an observer of many of the activities of the company's members when he was living in the mission station at Urika; and a careful account of the movement by R. Thomson, who was then Senior Social Welfare Officer of the Department of Education.

I gratefully acknowledge my debt to Professor Peter Lawrence, Dr Diane Barwick, also to Dr R. Crocombe and my other colleagues in the New Guinea Research Unit for reading drafts of this paper and making valuable criticisms and suggestions; to Mr Tommy Kabu for his assistance during my fieldwork; to Mr D. Marsh, Mr L.R. Foster and other members of the public service of Papua and New Guinea for their constant helpfulness during my stay in Port Moresby; and to Mrs Nancy Hitchcock for her unfailing co-operation both during fieldwork and in the course of preparation of the studies published in this Bulletin.

Chapter 1

Introductory

a. Traditional Purari society

The Purari Delta lies some 200 miles north-west of Port Moresby and comprises 500 square miles of alluvial tidal swamp land which is nowhere more than three feet above sea level (Allen 1951:1). The population of the Delta was estimated to be 6,000 in 1951 (Allen 1951) and divided into a number of tribes which are culturally and linguistically homogeneous. Williams (1924:5) identified four tribes and Maher (1961:14-15) six.

Water transport facilitated and defence necessitated the concentration of each of the tribal groups into several large villages, some containing more than 2,000 people (Williams 1924:4). The villages, which were built on river banks, were squalid and uncomfortable (Williams 1924:1). Each resident of a village belonged to an exogamous patrilineal descent group called larava, which was divided into exogamous moieties called mekai. Social and ceremonial activities centred round the ravi, a building in which each larava had its section on the side appropriate to its moiety.

The staple diet was sago and, near the coast, coconuts were grown. Fish were mainly caught by women while men hunted pig and small game. A small amount of food was produced by gardening. There was little internal trade but the annual trading expeditions (hiri) by the Motu people played an important part in Purari economy. Motu pots, armshells and other ornaments were exchanged for sago and canoe hulls. Relations of formal friendship were established between captains of lagatoi (trading canoes) and Purari village leaders.

b. Post-contact social changes to 1945

Post-contact changes in Purari society resulted from the actions of the Administration and of Christian missions, the introduction of a money economy, and migration in search of employment.

Early government activity in the Delta was limited to discouraging attacks on Europeans and later to suppressing intertribal warfare, which was achieved very slowly. Maher (1961:48) described

the far-reaching effect of the latter in undermining the structure of Purari society. The Purari believed in imunu, 'the all-pervading essential of the world, a force which resided in all things, and without which they would not be what they were' (Maher 1961:26). Each larava kept in its ravi a monster of wicker called kaiemunu which personified the imunu. The principal ceremonies, which required a human sacrifice, centred round kaiemunu. Intertribal raids for victims were frequent, but they did not occur within the tribe. When warfare ceased, ceremonies connected with kaiemunu lost their meaning and ravi ceased to be the focus of village life. This in turn caused the larava to diminish in importance. Some of the largest villages split into smaller units, probably because of the absence of need for defence. The traditional leaders, the office-bearers (amua) of the ravi, were largely replaced by the government-appointed village constables (Williams 1924:110), some of whom would have been amua by birth.

Unofficial village councils introduced in 1923 made little progress. Little was done to develop a sense of responsibility in the villages and councillors were treated as subordinate officials (Healy 1962:172-3). Traditional leadership had disappeared and the new institutions did not adequately replace it. Government patrols were few and the main concerns of government were to keep the peace, enforce the Native Regulations and labour regulations and collect tax.

Although the London Missionary Society had worked in the Purari Delta since 1911 and the Seventh Day Adventist Mission had been represented between the wars, little headway had been made. 'Illiteracy, even in 1946, must have been as high as 99.5 per cent and membership of the Christian Church did not reach three figures' (Allen 1951:2).

c. Economic development

From early in the century Purari men were engaged in wage labour away from the delta. Though according to Mair (1948:126) the limits of recruitment had been reached by 1919, an added inducement to employment was introduced in that year in the form of native taxation. A number of Purari people passed through Port Moresby on their way to work and some stayed in the town. Four men who settled near Port Moresby between 1913 and 1920 played an important part in the history of Rabia Camp.¹ Limited and often short-lived enterprises of European traders provided access to imported goods and before 1939 the Purari people were beginning to establish timber and copra businesses.

¹ See pp.23-4.

During the war the number of Purari people employed for wages increased until 50 per cent of adult males were away from their villages (Maher 1961:44) as police, carriers, members of the Papuan Infantry Battalion, and wharf labourers. Accounts by my informants support the descriptions given by Mair (1948) and Hogbin (1958). The majority of workers were under legal compulsion to stay, though conditions in many labour compounds were poor and treatment by employers often harsh. Until the end of the second world war the ruling wage was \$1.00 a month plus rations and accommodation.

Returning labourers bought tools (which reduced subsistence tasks and freed labour for employment), cloth and minor luxuries. Many people seeing the immense amount of goods brought into the country by the allied armies, were struck by the comparative paucity of goods obtained by themselves.

Despite these external influences, Allen (1951:2) claimed that in 1946 traditional Purari society appeared outwardly to be little damaged:

The 'ravi', centre of ceremonial and socio-political life, still exerted its influence. Sacred relics were preserved and venerated, mutilation of septums and ears was practised, and initiation rites were continued in unmodified procedures.

Yet, as Maher (1958b:54-5) observes, the feeling that their culture was incomplete and inadequate in face of the European led to 'a rejection of the old and a turning towards the new on a mass scale'.

Chapter 2

The Tommy Kabu movement¹

a. The leaders

In 1945 a movement developed in the Purari Delta which, aiming at economic development, achieved a social revolution. Tommy Kabu, who produced the ideology and inspiration for the movement, was born a member of the I'ai tribe in about 1922. After a short time at the London Missionary Society school at Urika, he ran away in 1935 and later joined the police at Samarai. He and Aua Akia, his kinsman and chief lieutenant, say that the stories of a relative who had been a policeman during the 1914-18 war caused them to seek adventure. When the war came to Samarai in 1942, Tommy and some Australians sailed in a small motor vessel to Cooktown where he was employed by an Australian naval officer, Lieutenant-Commander N.S. Pixley. He first served ashore as an officer's orderly and then during 1943 and 1944 at sea in H.M.A.S. Bundaberg, carrying out the duties of an able seaman.

In Australia he lived for varying periods with his employer's family, where he worked in the house, taught the children seacraft and looked after them. He is described as quiet, constantly reading his Bible and as not drinking, smoking, or associating with women. He was well known to Australians and Americans in Brisbane and was generally popular. He made a number of European friends, one of whom took Tommy to live with his family in Adelaide for a month.

From my personal observation, Tommy Kabu dominates his followers by his determination and self-control. Even when he is angry, which he often is, at the memory of some past injustice or at a present frustration, his self-control does not desert him. At meetings he seeks to win his point by persuasion and patiently waits for an opportune moment to expound his views. He speaks quietly and even when opinion at a meeting goes against him he remains even-tempered.

¹ The following account is based on my own fieldwork. Where I have made use of the work of Maher and others, due acknowledgment is made.

European observers have noted his indifference in the face of physical danger (personal communication by Mr N.S. Pixley).

The same quality of self-discipline is apparent in Aua Akia, but in a more rigid form. Joining the police after Tommy Kabu had already been recruited in 1937, he volunteered to join the Papuan Infantry Battalion in 1940. He says that as a result of being the first man to volunteer he was made a corporal. He saw action in a number of areas and during the retreat from Buna in 1942 he claims to have led a party of Papuans, Australians and Americans to safety over the mountains to Abau. He was discharged in June 1946.

In their contacts with Europeans both Tommy Kabu and Aua Akia were not only treated as equals but also found that their capacities were in some respects superior. Aua Akia constantly expresses his wonderment at what he, a man without schooling, has achieved as a soldier and as a leader.

At the end of the war both were impressed by the promises, made by Australians and others, of the help which would be given to Papua and New Guinea, which they understood to mean the raising of Papuan living standards to a European level.

Aua Akia says that promises were made to the troops before discharge by a 'big' colonel and there is evidence that such promises were widely made. McCarthy (1963:225) refers to 'ridiculous promises made to New Guinea native soldiers by some of the commanding officers who addressed farewell parades' and the same point is made by Lawrence (1964:124). Tommy Kabu preserves a record of a newspaper article written in 1945 which stated that Australia would contribute \$200,000 to the development of Papua-New Guinea. To most Papuans with little education, figures beyond 100 cease to have an exact meaning and this represents a very large sum. The fact that the Australian contribution has been very much greater is irrelevant because Tommy Kabu and his people, from their point of view, received no benefit from it.

This help was to come from outside Papua-New Guinea, and both Tommy Kabu and Aua Akia make a sharp distinction between Europeans who lived in Papua-New Guinea in whom they had no confidence, and those living in Australia and elsewhere. People in other areas also made this distinction. Reed (1947), quoted by Stanner (1953:90), says that the people of the Markham Valley in 1944 discriminated between 'Australian' troops who were 'sorry' for them and the 'English' (pre-war officials and employers) who treated them badly. To emphasise the contrast, Tommy Kabu was a personal friend of many in Australia, but was beaten for being 'cheeky' in a repatriation camp in Queensland which was run by an ex-New Guinea planter (personal communication made by a European in contact with Tommy Kabu at that time).

b. The reform policy

As Tommy Kabu knew only enough English to enable him to exchange simple ideas, his understanding of Australian values was gained mainly from his observation of the behaviour in a wide range of contexts. He was therefore protected from attempts to indoctrinate him with any particular political ideology. He was, however, influenced by his friends who encouraged him to work for the betterment of Papuan living standards when the war was over.

Before he left Australia, Tommy Kabu became imbued with two dominant ideas. The first was the inadequacy of Papuan wages and the need to raise living standards. He turned to commercial enterprises as a means of raising living standards, and forbade his followers to work for wages, a ban which was widely obeyed. Secondly, he contrasted the cultural and linguistic unity of Australian society with the diversity and disunity of the peoples of Papua. He therefore sought ways in which the people of Papua could become united. He decided to return to Papua and 'get a big boat for trading sago and other goods and get all Papua and New Guinea natives to come together'. In his search for a marketable commodity he chose sago; and as Julius stressed in 1947 (1947:70), in organising the sale of sago in Port Moresby he was reviving the traditional export trade of the Purari, a point apparently unrecognised by Maher.

To achieve his aims of raising living standards he developed a policy for economic development and social change which is remarkable for its consistency and thoroughness. He considered that the great wealth of Australians was connected with their religious beliefs and their social organisation and he adopted Christianity as the religion of his movement. He saw that Christianity also had the advantage of universality and would link the Purari with the more sophisticated Christianised areas along the Papuan coast.

c. The movement in the Purari Delta

Tommy Kabu returned to Papua in 1945 and while on leave pending discharge from the Navy,¹ he went to the Purari Delta and collected money for the purchase of the 100 foot schooner Ena from the Navy and approximately \$4,000 out of a purchase price of \$6,000 was paid in April 1946. During May she was accidentally set on fire and disabled. While living on the Ena, Tommy Kabu was visited by Aua Akia and a group of Purari soldiers before they were discharged from the Army. Tommy Kabu outlined his plans to Aua Akia, who

¹ He was discharged in January 1946 and given a discharge certificate, although, according to Mr Pixley, he was never formally enlisted.

went to the Delta and started an agricultural enterprise called the Pai-iri Mailau or I'ai Company, with representatives from a number of villages. Both Tommy Kabu and Aua Akia say that the latter founded Pai-iri Mailau Company which they also called the I'ai Society. Maher (1961:73) says it was organised in 1952 with advice from the patrol officer 'and with the co-operation of Tommy Kabu', and on p.130 that 'the I'ai Society was formally organised in 1954'. The patrol officer probably encouraged the reorganisation or revival of an existing group.

During the second half of 1946 and also early in 1947 Tommy Kabu spent several months in the Delta implementing his programme. He organised the abolition of pagan ceremonies and the destruction of the ravi and traditional objects connected with them - often to the accompaniment of Christian prayers and readings from the Bible. The monogamous Christian family was declared to be the ideal and attempts were made to improve the status of women. Traditional practices such as the piercing of the septum were abandoned at his order. Police Motu was adopted as the language of the movement and it was spoken as a conscious preference even in the villages. A number of villages were removed from their riverine sites to higher ground and houses were built according to European designs.

Amazing progress was made in certain villages and straight rows of houses sprang up almost as quickly as the people had abandoned their ravis. The new houses were constructed and built in two straight rows facing on to the village street. (Thomson 1951:17)

Tommy Kabu organised the construction of a new village, Hevesea, near the wharf of the European-owned saw-mill to serve as a collecting point for export. Between the years 1946 and 1950 a large quantity of sago and other produce was delivered for export by the growers.

d. Economic activities in Port Moresby

In November 1946 Tommy Kabu returned to Port Moresby where he made his headquarters. He subsequently paid several visits, lasting up to three months, to the Delta to encourage production of sago in the face of governmental opposition, and to collect money for the repair of the Ena. Early in 1946 he had formed the Purari Sago Trading Company, which he claims was the first purely Papuan commercial enterprise, and had established a depot in the town. The first shipment of sago was received in August 1946 and according to Tommy Kabu's records, these shipments continued until the last shipment handled by his company was received in October 1949. An investigation by a co-operative officer in June of that year found that there had been a loss of \$1,000 during the previous

six months¹ and the District Officer said that the Purari producers had 'been shipping sago to Tommy Kabu for some years and so far have seen nothing for their efforts'.² In 1953 Tommy Kabu was forbidden to engage in the purchase of sago³ and in that year he returned to live in the Delta.

Co-operative enterprises among the Purari have continued to be organised under government sponsorship. The export of sago to Port Moresby continues to be organised by individuals and groups. There were several large shipments of sago in the early 1960s and in 1963 a group of relatives from I'ai who were connected with Tommy Kabu brought 65 bundles of sago, estimated by Hitchcock to weigh 2,700 lbs. These were sold at Koki market and at Pari village for approximately \$188.

The Tommy Kabu Camp Society was formed under the guidance of co-operative officers in 1948 and by February 1951, 91 members had subscribed \$256. The main activities of the society were a store, laundry and bakery, in which Aua Kemoa was the baker, and a tea house which was started in 1950. An area near the road was laid out as a market garden and vegetables were sold by hawking to European houses. Only two people were officially gardeners, although others sometimes helped and shared in the profits.

The most important of a wide variety of economic activities organised by Tommy Kabu at Rabia Camp was the marketing of sago and other produce shipped from the Delta. Complex traditional trading systems were involved in the distribution of sago from the Gulf of Papua along the south-east coast of Papua, and hiri expeditions were still being undertaken in 1958 (Groves:1960). Sago still forms an important item in the diet of peoples in the Port Moresby area. It is prized for its keeping qualities and in the past was included as part of marriage exchanges. There was therefore a large potential market in the Port Moresby area when Tommy Kabu formed his marketing company. According to an Administration officer, their sago competed successfully in price with more readily available imported foods such as flour and rice, but it was not always brought to the market in good condition. It was also sometimes necessary to sell it in the local villages. Tommy Kabu bought a truck to facilitate the transport of sago, but when in 1951 it required a new engine, costing \$180, he applied unsuccessfully to the Administration for the return of the \$600 which

¹ Unsigned memorandum to the Director of the Department of District Services and Native Affairs (D.D.S. & N.A.), dated 16.6.50. File No.21/21/5.

² D.O. Kikori to D.D.S. & N.A., dated 2.8.50. File No.21/21/5.

³ Acting D.C. Central District to D.D.S. & N.A., dated 5.8.53. File No.21/21/5.

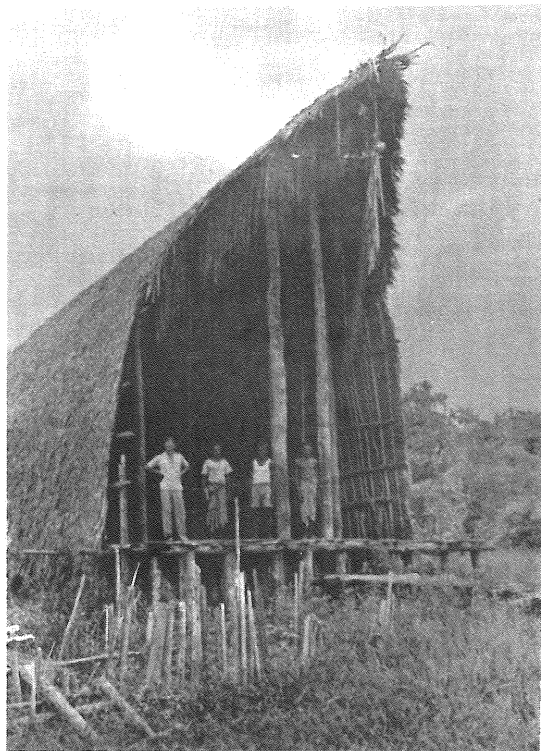


Plate 2. Traditional house in the Purari Delta

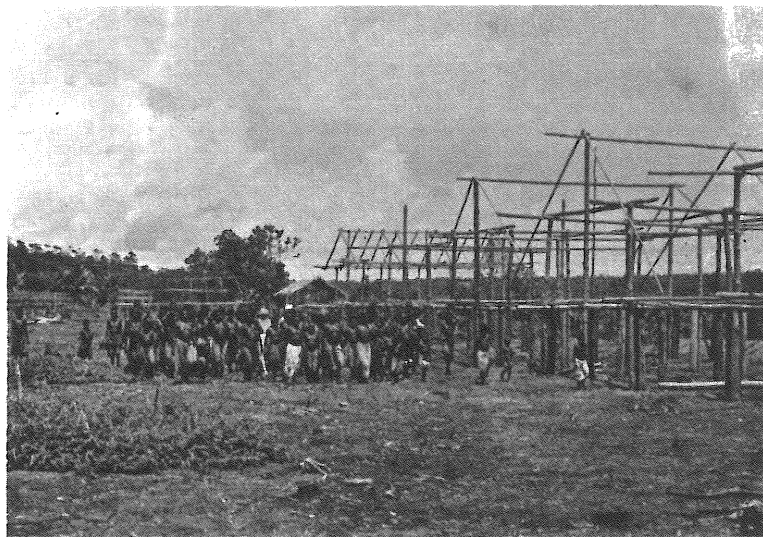


Plate 3. A new village in the Purari Delta, 1947

he had personally contributed towards the purchase of the Ena. In spite of difficulties in distribution and some loss through lack of storage, the organisation successfully disposed of the sago and other produce which it received from the Delta. Even after the sago company had failed, a senior Administration officer observed that the only way sago could be sold in Port Moresby was by hawking and that Tommy Kabu was the most suitable agent for marketing it.¹

Tommy Kabu organised the employment by the Administration, which then provided stevedoring services (Mair 1948:214), of a number of Purari as wharf labourers and, at a date which is uncertain but which appears to be May 1953 when his record ends, 63 men - 40 Koriki, 22 I'ai, and 1 Baroi - were entered on his roll. Transport was provided by the Administration and at times by the company's truck. According to Tommy Kabu, wages were \$0.50 a day in 1948. In 1951 he tried to secure an increase to \$0.60,² and in 1953 the rate was increased to \$0.80.

The economic projects in Port Moresby were potentially sound and were for a time successful. Eventually, however, they failed. The camp society was closed down by the order of the Administration in 1953 and the market garden project ended when the land was taken for housing. Apart from the cessation of sago shipments which is discussed above, the two main causes of the failure of these enterprises were excessive staff and mismanagement.

Men were needed to handle sago shipment only three or four times a year, only two men worked full-time in the garden, and the store, bakery and tea house required about six. In about the beginning of 1953, according to a list of members recorded by Tommy Kabu, there were 32 members living in the camp: of these, 25 were members of Tommy Kabu's own tribe. The society was therefore considerably overstaffed.

The activities of the society were carefully supervised by members of the co-operative department and the failure of the store and other undertakings was partly due to a lack of familiarity with purely commercial transactions. It may also have been due to the expectations of members that officials of a commercial organization should behave towards them in the same way, for example in relation to the distribution of assets, as would leaders of a traditional kin-group. Although the clerk/storeman was accused of dishonesty by members, it is probable that he only yielded to insistence that the society's assets should be distributed to them when they required them. They demanded, for example, that tins of meat costing \$0.25 should be sold to them for \$0.10. Belshaw, when discussing the

¹ Acting D.D.S. & N.A. to D.O. Kikori, 20.9.50. File BTM 21/18/1.

² Letter written by Tommy Kabu, dated 18.12.50. File 21/21/5.

conflict between the impersonal administration of a joint enterprise and the claims of traditional society, describes a similar situation in his account of post-war economic development among the southern Massim:

A storeman, for instance, often distributes goods or gives them 'credit' because he cannot resist their claims; but what he gives in law belongs to the shareholders. Soon the books do not balance, and the unfortunate man is in trouble with the authorities. (1955:65-6)

There was one later economic enterprise at the camp. In 1954 Mumuria Village Society with Ripi Vai'i at its head opened a store with money subscribed, according to Tommy Kabu, by both Mumuria and Goaribari people living in the camp. As well as a store, the society operated a truck which delivered firewood for sale mainly to the native hospital at Ela Beach. The store was rebuilt at the Goaribari end of the present site when the camp was moved. Maher (1961:132) says that it was 'a lively concern' in the summer of 1955, but it closed in 1956 because its truck broke down and it lost money. There was litigation and an investigation by the District Officer, Port Moresby.¹

e. Reasons for the failure of economic activities

Maher (1961:66-77) ascribes the failure of the economic activities of the movement first to lack of specific appropriate knowledge and techniques, and secondly to the absence of arrangements for the payment of those who produced sago and other commodities in proportion to their contributions. He notes that attempts to work out a satisfactory arrangement 'were frustrated by the inability to operate even the extremely simple book-keeping procedures which were finally introduced' (1961:69). He also discusses the lack of transport facilities and the attitude of the Administration. He concluded that little could have been done. 'The natives simply did not possess the necessary knowledge and skills, and the Administration did not have the manpower to save the situation.' (1961:73) His conclusion that in these conditions failure was inevitable requires re-examination.

f. The attitude of the movement to the Administration

Members of the movement sought to isolate themselves from local officers and from European employers and businessmen - in fact, those Europeans who might use their authority to hamper or destroy the movement. Officials became suspicious of the air of secrecy,

¹ Dep. Reg. of Co-op. Soc. to D.C., Gulf District, 26.4.56. File BTM 21/21/5.

but the people were not antagonistic to Europeans as such: they remained, for example, on friendly terms with Allen, the missionary at Urika, and frequently visited him, although they did not always heed his advice. He deplored, for example, the destruction of the ravi and 'so much that was beautiful and essential to the cultural life of the people' (Allen 1951:8). They looked to Australia and other modern countries for the help which they needed. Tommy Kabu kept in touch with his former patron in Queensland, Mr Pixley, and was constantly writing for assistance to the Secretary of the Navy until the end of the 1950s. He says he continued to believe that the promised help from outside would come.

g. Political aims

Tommy Kabu's reported actions and contemporary correspondence confirm his conversations with the writer, suggesting that as late as 1962 he hoped to unite Papuans with himself as their head. This was a long-term aim, because he regarded monetary wealth as the road to power and the success of his economic plans as a prerequisite to the achievement of his political aims. His policy was to keep within the law, although he was vigorous in asserting his right to differ with the Administration about the future of his people.

The attitude of his followers was less clearly defined. The nearest government post was remote and communications were very slow. The burning of the ravi and the re-siting of some of the villages took place before the government could take preventive action. Their actions in building elaborate rest-houses for Tommy Kabu and his lieutenants, setting up courts, building gaols, and drilling with wooden rifles suggest that they wished to control the administration of the area. They made no attempt, however, to resist the authority of government officials on patrol. Their main aim appears to have been to unite members of the movement in the interests of their economic programme in the face of opposition by established leaders who resented the position achieved by Tommy Kabu.

h. Attitude of the Administration to the movement

The differing attitudes of three groups within the government can be distinguished - those of senior executives at Port Moresby, of the Native Affairs officers in charge of the Delta Division, and of specialist officers (such as co-operative officers), whose influence was brought to bear three years after the movement had begun.

The senior officials were aware of the interest which the Department of the Navy and his friends in Australia took in Tommy Kabu, and were able to take a more detached view than officers in the field. In December 1946 the Acting Director of Native Affairs

addressed a letter to the District Officer and to Tommy Kabu jointly saying that the movement should be treated with sympathy and consideration. There was, however, no overall government policy towards the movement.

In the Purari Delta, shortage of staff, the people's secrecy, and transport difficulties led to almost complete ignorance of what was happening and the path chosen by local officers in the early years was one of repression. Tommy Kabu was taken to Kikori (according to European accounts for consultation and according to Papuan accounts after being arrested with a considerable degree of force), and released as a result of representations made to government headquarters at Port Moresby. The people were discouraged from making sago, at times successfully, until visits were made by the leaders to rally them. As a result, production was erratic.

The local officers were disturbed by the size of a movement which transcended administrative boundaries and threatened to usurp their authority. It is perhaps significant that Tommy Kabu, having united the people of the Purari Delta, was arrested as he was trying to persuade people living outside the Delta to join the movement. In 1950 a patrol report noted that 'a general distrust of the Administration exists in the area...' (Thomson 1951:19). It was not until 1956 that a government officer could write that the influence of Tommy Kabu was broken and that of the Administration had been built up.¹

The advice of specialist co-operative officers became available to the movement in 1948 and 1949 when the company was running into difficulties and Tommy Kabu felt that he needed help. These officers made every effort to put the company on a sound commercial basis and this produced a rapprochement between the movement and the Administration. They considered, however, that it was too big and too unwieldy and they were dismayed at the chaotic condition of the accounts. While they were assisting Tommy Kabu in a number of ways, for example by arranging for the training of clerical staff, they were encouraging the formation of smaller associations.

Members of the Co-operative Section were able adequately to supervise the commercial activities organised by Tommy Kabu at Rabia Camp. While it was thought desirable to organise the producing end (Thomson 1951:20), there was insufficient staff to provide continuous assistance to the growers. Such control as was exercised by co-operative officers tended to stifle initiative. Maher describes how in 1952 or early in 1953 the reorganised I'ai society, which was being efficiently run,

¹ Dep. Reg. of Co-op Soc. to D.O., Kikori, 26.4.56.

was essentially suspended by the Administration, when it appeared likely that a cooperative officer could be stationed in the area. The intention was not to abolish the organisation but to hold up its activities until they could have the benefit of expert guidance.

No officer had been appointed by mid-1955 (1961:74).

One of the most difficult problems which the movement faced was the transport of their produce, especially sago, and patrol reports tell of stacks of sago rotting while they waited for shipment (Thomson 1951:17). Before the second world war, Purari people wanted to buy a vessel (Maher 1961:42), and throughout the movement's existence this was their most important aim. To raise funds for the repair of the Ena 'the Purari people engaged in a frenzy of making sago and producing garden foods...' (Allen 1951:3) and according to the report of a patrol made in June 1946 (Thomson 1951:18) 'word was sent ahead that when asked their desires, the people were to answer in a voice, "We want a boat"'. Four thousand dollars were raised for the repair of the Ena, and when in 1950 the Administration sought to return their shares of the original purchase money, which had been recovered from the Navy on the grounds that the Transactions with Natives Ordinance had been infringed, the majority refused.¹ Attempts to purchase a new vessel, with some support from the Administration, continued to be made until 1956, when Tommy Kabu unsuccessfully sought to have the Ena funds released for the purchase of a vessel from Kwato Mission. These funds are still held in trust by the Administration.

The failure to obtain a vessel was due to the government's reluctance to allow the Purari, whom they regarded as river people and not capable of handling a vessel properly, to operate one unless their conditions were met. They were also reluctant to allow Tommy Kabu to handle funds which they regarded themselves as holding in trust for the Purari people (Thomson 1951:19). A co-operative officer who was concerned with the movement's activities says that it would have been possible for the people to have obtained a replacement for the Ena if they had employed a captain and crew consisting of Kiwai or Motu people with seagoing experience; obtained the assistance of a shipping agent in Port Moresby and run the vessel purely as a commercial proposition; and accepted that their vessel would spend much of its time away from the Delta where there was insufficient work for it. Tommy Kabu told government

¹ Report of Acting Reg. of Co-op. Soc. who visited the Delta Division in March 1950. File 21/18/1.

officials that these conditions were unacceptable.¹ The officials considered that in refusing permission to use the money collected for that purpose to buy another vessel for the movement, they were safeguarding the interests of the Purari people. A number of other groups besides the Purari acquired their own vessels. Two village groups in the Western Division bought luggers (P.A.R. 1947-8:32), and Wedgwood (1947:4) describes how one of them experienced the same difficulties in operation and management as the Purari. The Toaripi Association also purchased a vessel (Ryan 1963:13).

According to Maher, coastal shipping made irregular calls and did not always have sufficient space (1958b:113), and Thomson says that 'there is some evidence that commercial shipowners were not over-enthusiastic in making space available' (1951:17). Co-operative officers serving at the time, however, maintain that the main problem was that the sago was 'wet' and that the people were unwilling to undertake the task of drying it. This meant that the 'wet' sago which fouled the bilges of the vessels had to be carried on deck where only limited space was available. It is significant, however, that large quantities of sago were exported to the Port Moresby area in the days of the hiri, remaining stacked for some weeks in the hulls of the canoes.

The movement could only have realised its economic aims if its initial impetus had been maintained. This demanded of the members a continuing belief in the aims of the movement and support of its leadership and readiness to work hard for a long period without immediate return. The members showed such support as long as there was hope of keeping the movement in being and even when it ended they did not lose their confidence in Tommy Kabu.

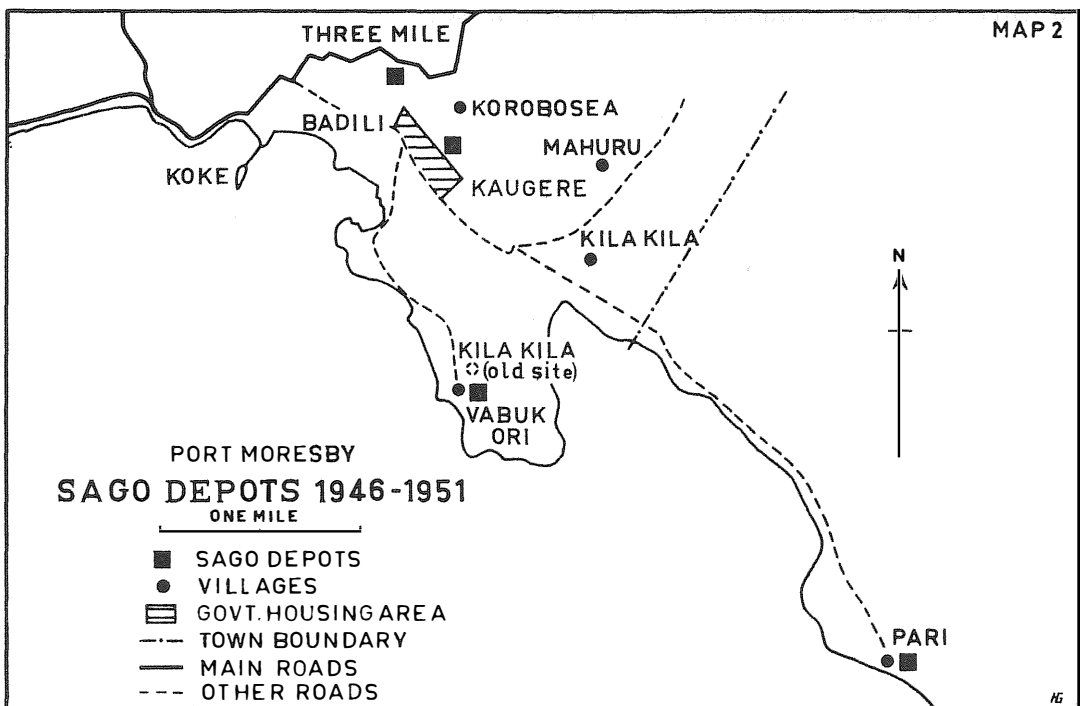
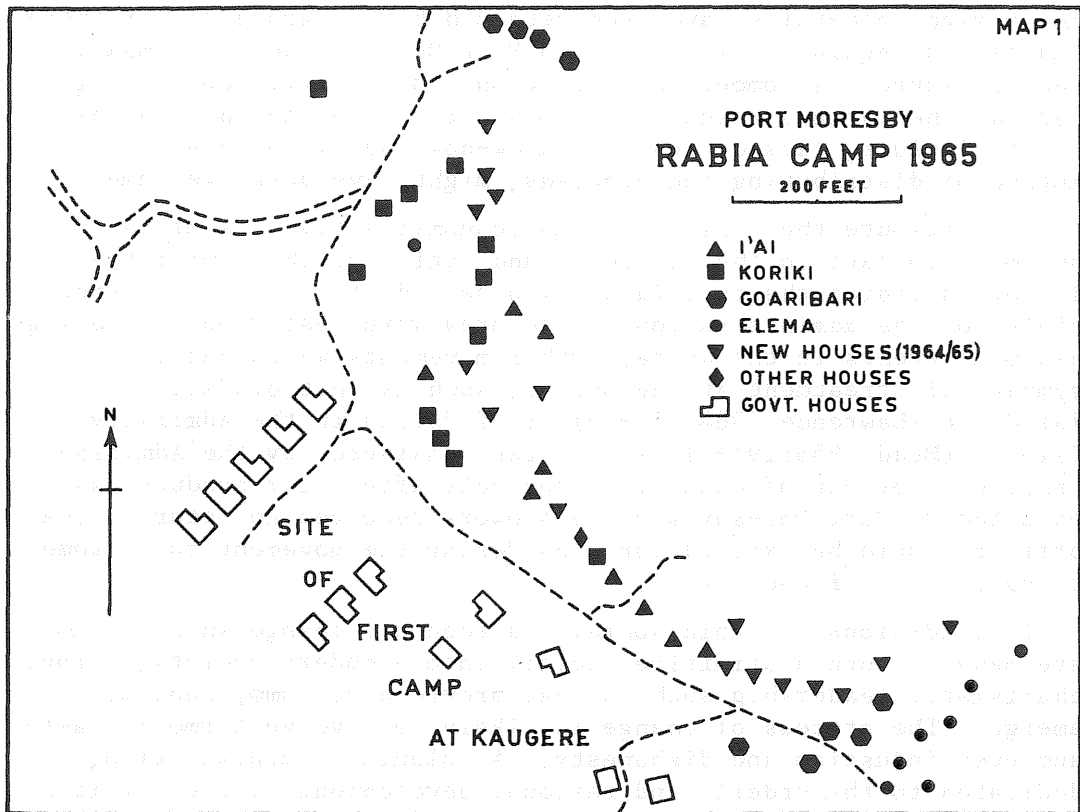
The evidence suggests that among the most important causes of the failure of the Tommy Kabu movement were the unco-ordinated policies of different government departments towards the movement rather than shortage of staff; and, partly as a consequence of those policies, the failure to make adequate arrangements for the transport of produce from the Purari Delta to Port Moresby. The responsibility of the Administration lies in its opposition to the early activities of the movement in the Delta; suspicion of the intentions of Tommy Kabu as a leader and of the scale of the movement; stifling of initiative through over-caution; and failure to find a solution to the shipping problem. The determining factor was lack of transport, which led not only to waste and the discouragement of the growers but also made necessary accumulation of large capital sums for the purchase and repair of vessels; this

¹ Letter reference No. BTM 21/21/5, dated 31 March 1966 from the Acting Director, Department of Trade and Industry, to Executive Officer, New Guinea Research Unit.

money might otherwise have been retained by the growers. If there had been a regular flow of sago to Port Moresby and the company had continued its commercial operations for a sufficiently long period, the factors which Maher considers to be the main causes of its failure, lack of business know-how and of an acceptable method of distributing the proceeds, might have been overcome.

To attribute the failure of the economic activities of the movement in part to the attitudes and action of the Administration is not to indict the individuals who served it. Officers responsible for the administration of the area were justified in feeling alarm at events in the Delta. Other movements which had received sympathetic treatment at the outset, such as that of Yali on the Rai Coast (Lawrence 1964:215-16) or of Paliau in the Admiralty Islands (Mead 1956:191-2), were later considered by the Administration to be out of control. When year after year produce was exported to Port Moresby and the growers received no return, local officers could be excused for considering the movement to be something of a confidence trick.

In conditions of rapid social and economic change when attempts are made to turn a primitive society into a modern society, strong charismatic leadership such as that provided by Tommy Kabu may emerge. The process of change is likely to involve turmoil, waste and even injustice and dishonesty. A colonial administration, dedicated to the orderly and rational development of the territory under its control, is unlikely to tolerate activities which appear to threaten the foundation of its regime.



Chapter 3

Rabia Camp

a. The search for a site

After his visit to the Purari Delta to collect money to buy a ship, Tommy Kabu walked back to Port Moresby in March 1946. His first concern was to find a site for his depot, and the four men who settled in Port Moresby between 1913 and 1920 were instrumental in enabling him to do so.

A Koriki man, Paimuru Ove, says he came to Port Moresby in 1913, married a woman from a coastal village 80 miles to the east, and in 1930 settled in Pari (Map 1), a village with which the Purari had traditional trading relations. He was joined there by ten other Koriki men. When the Pari people were evacuated to Tavai with the people of Vabukori, Kila Kila and Korobosea villages,¹ the Koriki people went with them and returned with them to Pari after the war ended. Paimuru still lives in Pari and says that he is regarded as a member of Mavara iduhu (descent group) there.

Two Kaimari men settled in Vabukori village (Map 1). The first, Api Koivi, married a Vabukori woman who was related to Sere Henunu of Dalahasi Kila Kila iduhu, the holder of major rights to land by the shore. After the death of his first wife, he married a second Vabukori woman. The second Kaimari man was Api's relative, Aua Kemoa, who first married a Kila Kila widow. He brought up her two children by her first husband, and one of them married the son of Aua's friend Geita Kohu, a principal holder of rights to land in Kaugere. During the second world war, Aua's first wife died, and he went to Tavai with the Kila Kila people. There he married a woman from Keapara village, who was related to Sere Henunu with whom he had earlier worked at Port Moresby power house. Both Api Koivi and Aua Kemoa lived in their own houses in Vabukori.

¹ See Map 1. Vabukori is a Motu village, but one section is of Koita origin. Before the second world war Kila Kila village was located on the saddle of the hill behind Vabukori, but after the war one section built a village known as Kila Kila No.1 on a disused airstrip, and the other settled half a mile away in a village known as Mahuru or Kila Kila No.2.

The fourth man, Kaivira, is related to both Api and Aua. He came to Port Moresby about 1920 and married the daughter of a leading man of Badu clan of Kila Kila village. When she died he married a woman from Rigo subdistrict. He has a house in which he operates a trade store in Kila Kila No.1 village. Members of Badu iduhu agree that he has been co-opted as a member, and when land is sold to the Administration, he receives a share of the payment.

Through his connection with Paimuru Ove, Tommy Kabu first established his depot in Pari village where he had already lived for two months in 1945. In June 1946 he left Pari because there was no road to Port Moresby and lack of transport made it difficult to carry out his trading operations, and also the villagers wanted him to leave.

He then obtained permission from Sere Henunu to occupy a building left by the army on the shore at Vabukori. He left after a few weeks because stones were thrown on to the roof at night. According to Tommy Kabu, the rightholders were angry because he forgot to give them a share of the sago in return for the use of their land.

After an Administration official had told Tommy Kabu that he would not help him to find a site and that he should keep his sago on his ship, Tommy Kabu arranged with two brothers from the Koita village of Korobosea to occupy a site below the main road at Three Mile Hill. This arrangement is said by Purari informants to have been approved by another senior official who suggested that the rightholders should be given five pounds of sago a month as rent. Ten bundles of sago were given to them while the site was occupied. An ex-army hut was bought for \$32 and re-erected on the site which was the first to be called Rabia Camp.

Tommy Kabu again went to the Delta in connection with sago production in August 1946 and returned to Port Moresby in November. While he was away the District Officer became concerned at the growth of the population of the camp where native-style huts were being built. Tommy Kabu's second-in-command in the camp, Bai'i Aua, had become involved in a dispute because the District Officer wanted them to move. Rather than become embroiled with the Administration and uncertain of the attitude of the rightholders, Tommy Kabu looked for a new site.

b. Establishing Rabia Camp

Bai'i Aua approached Kaivira who was a close friend of Geita Kohu, the father-in-law of Aua Kemoa. Geita Kohu allowed Tommy Kabu's company to use land to which Geita held rights at Kaugere and the depot was moved there in January 1947. This site was also known as Rabia Camp. The company was allowed to use the land in

return for the payment of one bag of sago in every four and between 1947 and 1949 a total sum of \$174 was paid.

A formal agreement, witnessed by a co-operative officer, was then drawn up on 3 August 1950, in which the rightholders agreed to allow the company to use the land in return for payments of \$5 a month to be made through the District Office (copy in File BTM 21/21/5). Geita Kohu, who died in 1949, was not a party to the agreement. The first payment was made on 31 October 1950 and payments appear to have continued until the end of 1951 or the beginning of 1952. Some Purari say that when payment ceased, Uruba Geita, son of Geita Kohu, agreed that the Purari people should stay on the land and in evidence before the Land Board in 1956 it was stated that, after the payment of rent in sago ended, householders first paid \$0.30 a month and that this was subsequently increased to \$0.60 a month. Another Purari version is that when they gave a feast for the members of Badu iduhu, the Purari were adopted as members of Badu iduhu and given rights to the land which they occupied. Kila Kila witnesses agreed that such a feast was held, but denied that the Purari were given land rights. Uruba Geita in an interview recorded in 1963 said that the Purari group were members of his iduhu and were known as Badu Koriki. There is a precedent for this: members of a lineage of Gunina iduhu, Poreporena village, whose forebears came from Vabukori village, are sometimes known as Gunina Vabukori.

In 1952 Uruba Geita and his fellow rightholders sold to the Administration the land on which nearly all the houses in Rabia Camp stood. In 1954 the Administration required the Purari occupants to move and began to build a housing settlement for its own employees. The Purari rebuilt a number of houses to the east of the acquired land while others remained in situ. In 1956 the Director of District Services and Native Affairs decided to extend the Administration settlement. An enquiry held by the Native Lands Commission to determine the ownership of rights to land in the adjoining area found that Uruba Geita was the 'land controller'. No claim to rights was raised by the Purari at that time but whether or not they were aware of proceedings is not recorded. According to official documents the Purari had been repeatedly warned that the land on which they were living would be required for use by the Administration.

The land on which the houses stood was then purchased by the Department of Native Affairs and arrangements were made to build new houses. A bulldozer and tractor were hired and building contracts were let. When the settlers' gardens had been cleared, but before the houses had been destroyed, one of the Purari living in the camp complained to a member of the Crown Law Department. A Land Board, convened in 1956 to examine the Purari claims,¹ found

¹ T.P.N.G. Govt. Gazette No.46/56 of 8 October 1956.

that the Administration was 'owner of an unencumbered fee simple to the land in question' and that the Purari had no rights.

The Land Board produced its findings in November 1956, and shortly afterwards the settlers were given 14 days to quit. Employers were asked to find accommodation for employees who had been living in the camp, and those without work were sent back to the Delta. Uruba Geita allowed those who were without accommodation to rebuild on the hill above the area acquired by the Administration and agreed that they should stay there for two years. According to information which I received from Purari sources and from recollections of government officials serving in Port Moresby at the time, a conference was held at government headquarters to discuss the future of migrant settlements. It was later decided that 'licence agreements' should be prepared to permit migrants to stay in their settlements for a further two years but these were not drawn up. At the expiration of this period the Purari continued to live on that site where the camp has remained without further interference.

The arrangement made with Uruba Geita was that the settlers should help him in time of need in return for the use of his land. This has been the practice from the establishment of the camp and \$40 was collected by the Purari and given to him when he remarried in about 1949. The Purari contributed to the rebuilding of the Kila Kila church and as a result of persuasion by a Kila Kila councillor, agreed to pay their taxes to the Bootless Bay Local Government Council. When Uruba Geita died in 1963 the Purari contributed \$14 towards the funeral ceremonies. Uruba's heir and the other principal rightholders then told the Purari that the rightholders did not intend to sell the land and that the Bootless Bay Local Government Council would help the Purari to settle their land problems.

c. Leadership

When the sago trading and other commercial activities ended, the function of the camp changed and it became a housing settlement for Purari and Goaribari people living, many of them with their wives and children, in Port Moresby. It continued to grow rapidly.

The camp was originally laid out on naval lines with the houses of Tommy Kabu and his assistant in Port Moresby, Biri Aua, in a separate position on the higher slopes of the hill. Strict discipline was maintained: undue noise was forbidden, garbage cans were provided and the area was kept clean. 'Tommy Kabu has been controlling a well-kept camp near the Golf Club Port Moresby, which has at all times been kept scrupulously neat and clean.'¹

¹ Acting D.D.S. & N.A. memo dated 20.6.50. File BTM 21/18/1.

Towards the end of 1953 Tommy Kabu was seeking government permission to continue to manage the camp, but shortly afterwards he returned to the Delta. He was succeeded by an ex-policeman, Pou Akia. When Pou left to work on a plantation Biri Aua, who is called 'Councillor' Biri by camp residents, but who has never been a local government councillor, took over. He is a building contractor and the wealthiest man with the largest house in the area, and is often the spokesman for the people of the camp with the Administration and Local Government Council. The camp is law-abiding and gives little trouble to the Administration.

d. Housing and environmental sanitation

After 1945 most houses in villages and settlements in Port Moresby were built of materials left behind by the army. The universal design was a rectangular building on piles, with or without a verandah and with corrugated iron roof and walls. In present-day Rabia Camp, the houses of Biri, Tommy Kabu and three or four others resemble village houses of that type. A number of the houses in Rabia Camp are much smaller, and are roughly constructed of corrugated iron, wood, hardboard and any available material. A few houses have been built on the ground and are little more than shacks (Plate 4).

In 1963, only Biri Aua's house measured more than 400 square feet; three, including that of Tommy Kabu, were between 300 and 400 square feet; four were between 200 and 300 square feet; three were between 100 and 200 square feet; and the remainder were under 100 square feet. In 1965 a few houses of better design were constructed with walls of flat iron (Plate 5).

When the camp was removed to its present site, the houses were built in a straggling line parallel with the boundary of government land. Subsequent houses have been built in a rough circle and there is an element of order in the layout.

No urban services such as refuse collection are provided in the camp. Water is carried from the adjoining government housing area and disputes occur on account of this. After Tommy Kabu returned to the Purari Delta in 1954 the high standards of cleanliness enforced by him were abandoned. In 1956 the camp was observed to be very dirty (Foster 1956:10) and it remained so until towards the end of 1965. A few houses had pit latrines but they appeared to be little used, and defecation took place in the surrounding bush and among the rocks in front of the Goaribari area. Refuse was not removed and was thrown in and around the settlement. In November 1965, however, Aua Kemoa returned to the camp from the Delta and ordered the inhabitants to clean the camp: he was promptly obeyed.

In 1962 the Building Inspector caused demolition notices requiring the removal of recent extensions to be attached to some of

the Goaribari houses. The householders sought the advice of the Public Solicitor. The District Commissioner and the Building Inspector agreed that the Administration should encourage the inhabitants to build better houses. The District Commissioner agreed to provide metal piles for new houses and to instal roads, provided that the settlers could obtain some security of tenure for their land. The proposal was mooted that they should obtain a ten year lease but, as the issue of leases was of doubtful legality under Section 3 of the Land Ordinance, the matter was dropped. No attempts appear to have been made since to control building, and a number of new houses have been constructed and extensions to old houses added.

The camp site, which is scheduled for development as a low-cost building area, is likely to be acquired by the Administration in the course of the next few years. The camp could only be saved by a change of policy which would allow its redevelopment on the existing site.

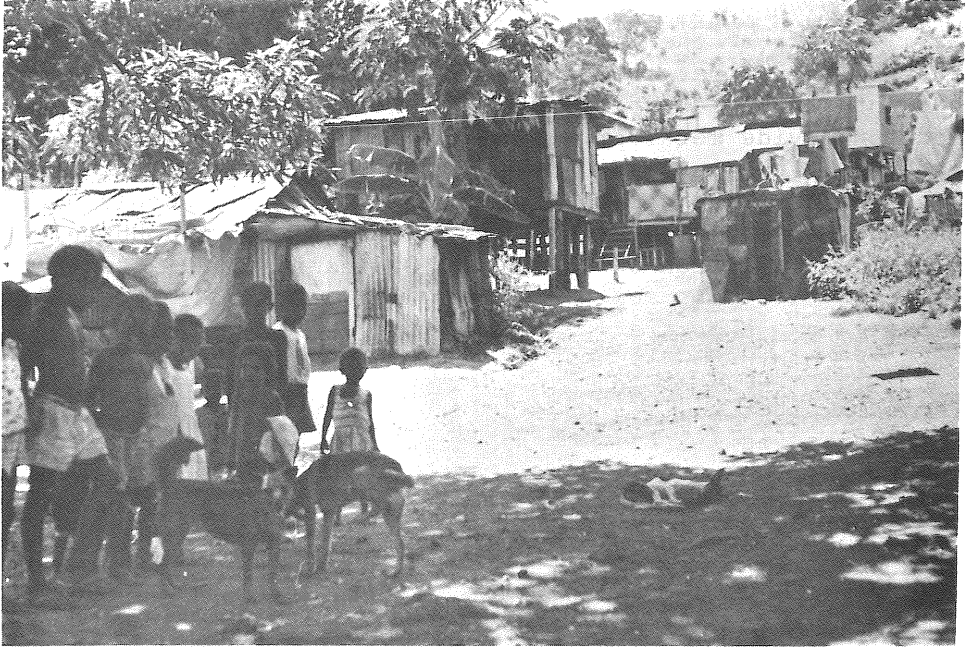


Plate 4. A general view of Rabia Camp

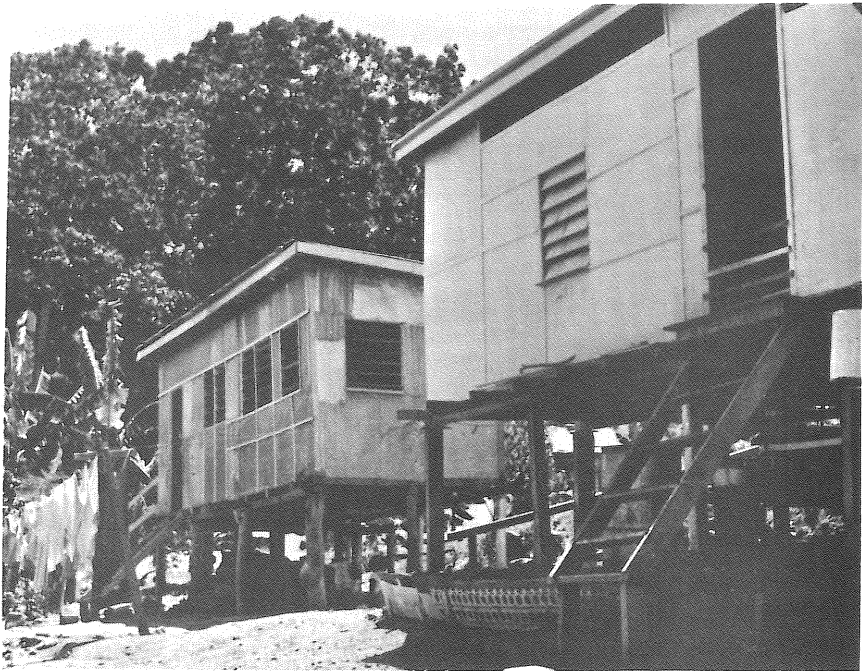


Plate 5. House recently built at Rabia Camp

Chapter 4

Land rights

The three points of reference for the analysis of land rights at Rabia Camp are the attitude of the Kila Kila rightholders to the occupation of their land by the Purari; the search by the settlers for security of tenure; and the official attitude to the occupation of the land.

a. Attitude of Kila Kila rightholders

The most important way in which those with no kinship tie can acquire rights to Koita land¹ is through affines. Marriage is ideally patrivirilocal but a man may allow his daughter and her husband to use an area of his land, the rights to which are inherited by the woman's descendants.

There is no word meaning 'adoption' in the sense that adoption confers land or other rights. The decision whether a person whose kinship ties are remote or non-existent should obtain rights to land when his protector dies will depend on his personal reputation, and the availability of land and the number of the dead man's direct descendants. The history of several 'accretions', which are defined by Groves (1963:21) as 'groups of agnates descended from strangers or from husbands of women of the iduhu', shows that when strangers are taken into a household, they subsequently strengthen their position by marriage into the group.

A rightholder may also allow men of other lineages to use his land for cultivation. Friends, and children of wives by a former husband (Motu: daelaj), may be allowed to use land. Kaivira (p.24) is accepted as a member of Badu iduhu, and although his wife is dead, his land rights are acknowledged, and he receives

¹ The Kila Kila landholders belong to the Koita culture group, the land tenure of which seems to be identical with that of the Motu. The fullest statement of the Koita system is in the report of the case of Geita son of Sebea versus Papua (1941, 67 CLR). Seligman (1910), Bramell (1964) and the writer's own researches have provided further information.

a share of money from land sales. Membership of a group involves reciprocal rights and obligations. When a person fulfils his obligations there is a reluctance to disturb the good relationships which exist. While rights of permissive occupancy can in theory be withdrawn, social pressures restrict the exercise of power of the rightholders to do so.

The introduction of a commercial economy has given land a cash value which increases with the demand for house sites, and with purchases by the Administration. By 1964 the Crown held rights to four-fifths of the area within the town boundary. Some land-holding groups now have very little land left. It is in the interest of primary rightholders to limit the size of the group within which proceeds of sales are shared, but on the other hand those with subsidiary or marginal rights stand to gain if they can establish a claim. Moreover, the co-operation of a large group of people in making gardens is no longer necessary. The present need is for house sites, and effective rights to many fenced blocks, each containing a house and small garden, are held by smaller groups and even individual households. A third effect has been to enhance the position of the head of the rightholding group, especially if purchase by the Administration is mooted, for the head is called upon to distribute the purchase price among all rightholders. Although there have been a number of disputes, the heads of some groups have not incurred the disapproval of other members when they have sold land without consulting them.

As the areas of land and the groups which hold rights to them have become smaller, the major responsibility of allowing migrants to settle is tending to fall to the head of the group.

Uruba Geita, when interviewed in 1963, said that his father Geita Kohu, who was principal rightholder to the Kila Kila land in question, in agreement with the other rightholders allowed the Purari to settle for three reasons. He wished to oblige his friend and affine, Kaivira; he was promised a valuable rent in sago for the use of the land; and he feared that the Administration might take his land. Fear of alienation, which is a reason which other rightholders in the Port Moresby area have given for allowing migrants to settle on their land, appears to have been the most important factor.

Alarmed by the increase in the camp population, Uruba Geita yielded to pressure by government officials to sell the land. After the Land Board had concluded its findings he recognised his obligation to the Purari by allowing them to settle on a new site and said that they were members of his clan. His heirs, anxious to prevent an open breach with the settlers, have reassured them in their occupancy of the land. These promises will be tested when an opportunity comes for them to sell the land to the Administration.

b. Search for security of tenure

Tommy Kabu was prepared to pay rent for land on which to build his depot, but he was forced, through lack of co-operation from the Administration, to make use of customary ties to obtain sites. Until the removal of Rabia Camp to its present site, land was occupied by the company in return for regular payments. At the same time some customary payments, such as that to Uruba Geita on his remarriage, were made to maintain reciprocal relations between the two groups.

The Purari claimed before the Land Board that they had been given the land at the feast or, in the words of the board, that 'they had permanent occupational rights' to it. In evidence before the Land Board, Uruba Geita denied that his father intended to alienate the land 'nor had he solely as Land Chief any right according to tribal custom to do so'. The board accepted his evidence and observed that occupancy in perpetuity on a rental basis was a prohibited transaction under Section 3 of the Land Ordinance. They concluded that it would be impossible to accept any customary rights which might affect the land to which the Crown held title defined under Clause 7, Schedule 2 of the Land Ordinance, since such rights are 'unknown to English law and it would, from the evidence...be quite impossible to define the parties entitled or the extent of their interest'.

After it became clear that they would not be able to hold the land by modern contractual tenure, the Purari continued to try to establish their right to occupy through traditional means.

c. Government view of the legal position

While, apart from the Land Board, there has been no legal decision which has determined the rights of settlers whom the rightholders have permitted to occupy their land, the Administration regards the settlers as 'squatters' in the sense of 'appropriation of another's land for one's own use without right or title' (Abrams 1953:12). The Land Ordinance (1962) governs transfers of native land. Under Section 81 no rights in native land shall pass to any person except to the Crown, but native land may be transferred between natives in accordance with native custom. Since rightholders in the Port Moresby area have traditionally allowed those who are not cognatically related to them to use their land, permissive occupants occupy native land legally until that permission is withdrawn.

A number of rightholding groups are on good terms with the migrant settlers on their land, and some groups have given settlers written permission to occupy their land as required by the Building Board before the board will approve plans to build permanent houses. Other landholding groups have indicated to the Administration that

they wish migrant settlers who occupy their land to leave, which has helped to confirm the Administration in their policy of treating such settlement as illegal. The attitude of such complainants is, however, often ambivalent. They do not wish to force the settlers to leave unless they find alternative accommodation, because of a feeling of obligation towards the settlers and in some instances through fear of sorcery. They would be happy to see the settlers removed by the Administration, which the Administration has consistently refused to do. Instead, the Administration has told the rightholders that they should initiate legal action to have the settlers removed, but has warned them that they may have no means of proving their own rights to their land. This has left the landholders powerless, and the legality of the settlers' occupation uncertain.

Whether migrants settled on native land can obtain security of tenure of their land, for example by means of a written agreement or lease, has yet to be legally determined. There appears to be no provision of the Native Customs (Recognition) Ordinance 1963 which would make such transactions illegal, but their legality has not yet been tested in a court. The decision would depend on whether custom must still be shown to have existed prior to general Administration influence, which Lynch (1965:33) says was a 'fairly standard approach to customary rights, especially to land' before the passing of the Native Customs (Recognition) Ordinance; or whether established native usage, however recent, is deemed to be custom.

Chapter 5

Policy of the Administration towards migration to urban areas

Attitudes of local officers to the activities of the company in Port Moresby developed in three stages. The first was one of hostility. Local officers gave no assistance in finding a site and actively discouraged the movement. The second was one of co-operation when the company's commercial activities were supported. The third stage, one of renewed opposition, was reached when the commercial activities failed and officials considered that the camp no longer served a useful purpose. According to a report of a government official in 1956, the standard of housing in Rabia Camp and in three other migrant settlements 'could hardly be worse' (Foster 1956:2) and the author considered that the camp should be removed and its inhabitants resettled (Foster 1956:18). In 1963 the inhabitants of the camp were told by an official in the presence of the writer that their occupation of the land on which the camp stands was illegal and that they should seek other accommodation. These attitudes were in accord with the general policy of the Administration concerning indigenous migration to towns.

From the establishment of British rule the employment of labour had been strictly controlled. Although the rapid development of Port Moresby after the second world war demanded a large labour force, and although many people were no longer indentured, control of labour migration was still thought to be desirable. The need for migrant labour in the town was accepted by the Administration, as illustrated by its organisation of wharf labour (see above, p.15), provided that only those usefully employed should remain and that nothing should be done to encourage the permanent settlement of migrants in the urban area. The Social Development Planning Committee of the Provisional Administration stated (1948:15):

the Administration must continue to base its policy on the government of the village unit. Though...we would encourage the establishment of suburbs for Papuans in urban areas; we are strongly against a policy that allows the establishment of an itinerant population, such as now exists in Port Moresby who...are fulfilling no useful purpose.... We would recommend, that early action be taken to...prevent this disadvantageous free movement....

The Inter-departmental Committee on Native Welfare recommended that families should be discouraged from migrating to places of employment and becoming alienated from their villages.¹ In 1952 the Acting District Commissioner, Kikori, deplored the effect on the Purari villages of the prolonged residence of men and young girls at Rabia Camp.²

Migrants caused problems of urban administration and were regarded as one of the major causes of crime (A.S.O.P.A. 1960a:10). The conditions in which migrants lived were considered to be a potential cause of disease and social conditions were thought to be undesirable. Attempts have therefore been made to control the residence of migrants in the town.

Regulation 76A of the Native Regulations 1939 provides that no native shall remain in an urban area for more than four days 'without lawful and reasonable excuse', and natives may also be removed from the town under the Vagrancy Ordinance 1912-1958. When the writer left Port Moresby in December 1965, the Administration were still making spasmodic attempts to enforce these provisions. In December 1963, for example, the South Pacific Post (6 Dec. 1963, p.5) reported that since September of that year 'a monthly average of 25 natives have faced charges of vagrancy in a Port Moresby police court', and some residents of Rabia Camp were arrested in 1965. Such action has had little, if any, effect on the volume of migration. In 1960 a Senior Officers' Course recommended that 'no attempt be made by regulation to restrict freedom of movement to urban areas' (A.S.O.P.A. 1960b:8). As Foster pointed out (1956:28), unless a pass system is introduced (and this he considered undesirable), attempts to control movement do not succeed.

In the post-war years reluctance to encourage the stabilisation of migrant labour prevented the Administration from making any attempts to provide family housing for migrants. In 1947 the District Officer was opposed to giving migrants leases as in his opinion this could lead to shanty towns and he considered that many migrants were parasites.³ In 1952 the District Officer considered that a bad precedent was set when two small settlements were established, at the direction of the Minister, to provide housing for natives removed from Crown land.⁴ The only indigenous housing provided by the Administration, for example the houses at

¹ Minutes of meeting held on 3.12.49.

² Acting D.C. Kikori to D.D.S. & N.A., 6.7.51. File BTM 21/21/5.

³ D.O., Port Moresby, to D.D.S. & N.A., 13.8.47. File NA 7/1/1.

⁴ D.C., Port Moresby, to D.D.S. & N.A., 22.1.52. File NA 7/1/1.

Kaugere and Konebada, was occupied by its own employees. It was not until 1956 that the Foster report and other official memoranda began to make it clear to the Administration that many migrants intended to live in Port Moresby at least during their working lives and Foster recommended that a suburb for 'foreign natives' should be established. The Administration accepted this recommendation and the first houses in the Papuan suburb at Hohola were occupied in 1960.

The committee appointed to consider problems associated with non-European housing reported in January 1960 that the majority of the people needing homes could not afford to pay the rentals of Hohola-type houses, and recommended that houses should be built to lower standards. In 1965 sites were leased at Sabama, near Kila Kila village, where building standards were relaxed to enable Papuans to build their own houses. By early 1966 no private individual had yet built a house there and the cost of building may still be too high to be met by migrants such as those who live in Rabia Camp.

Because they have considered that occupation of village land is illegal and because they have insisted on building standards which they cannot enforce and which migrant settlers cannot afford, the Administration have debarred themselves from achieving any improvement in living conditions in Rabia Camp and other migrant settlements. They cannot, however, provide any alternative accommodation. In present conditions, without adequate services and without security of tenure, the extent to which migrants can help themselves is limited. The settlements exist in an administrative limbo.

Chapter 6

Conclusion

In 1945 a charismatic leader acted as catalyst on the subtle changes which had for some time been undermining the structure of Purari society, and led a movement which aimed at bringing about a social and economic revolution among the Purari people. The movement appeared to officials and to the missionary then working in the Purari Delta as a realistic attempt to achieve higher standards of living and work performance. They believed that the Tommy Kabu movement was not a cargo cult (Allen 1951:5) and this opinion seems to have been accepted by Maher. Hogbin (1958:222) limits his definition of cargo cult to movements of 'raw bushmen retreating into dreams and frenzies', excluding the organised activities of 'sophisticated townsmen whose behaviour is for the most part rational'. On this basis, the Tommy Kabu movement should be included in the latter, rational, category. Yet the movements Hogbin cites, including that of Tommy Kabu, share a number of common characteristics: the appearance of authoritarian leaders supported by lieutenants and guards; the building of new villages with special houses for the leaders; and the construction of landing strips and wharves in the expectation of receiving goods, whether in the form of aid sent by oversea governments or cargo sent by ancestors. The basic question is whether those involved in the Tommy Kabu movement saw a causal relation between their efforts and expected rewards - whether they expected to achieve a higher standard of living as a result of their efforts to improve their economy - or whether they assumed that the adoption of European social and religious patterns would provide a key to obtaining cargo.

Other movements which began in a 'rational' manner later turned into cargo cults (see Brown 1966:156). There is sufficient evidence to suggest reasons why the Tommy Kabu movement did not do so, although Purari people did talk in cargo cult terms after it had failed (Maher 1961:122). Four elements in the movement need to be examined separately: the leader; his close associates and lieutenants (to whose importance attention has recently been drawn by Mead 1966:XX); the mass of followers living in the Purari Delta; and the epistemological system - the way in which the Purari viewed the world.

The movement led by Tommy Kabu and the movement headed by Yali as described by Lawrence (1964) may be usefully compared. Both men served with Australian forces but both had a very limited knowledge of English. Although both lived in Australia, their experience of Australian life was very different: Yali spent only six months there under service conditions (1964:123) but Tommy Kabu for three years had a wide and varied view of life, including residence in a number of European homes. Tommy saw Australia on his own, and he saw Australian culture, which was explained to him by Europeans, in Western terms. Yali saw it as a native soldier with other native soldiers and thus always interpreted what he saw in terms of native cultural idiom (Lawrence 1964:128-9).

Yali's rehabilitation scheme and the programme put forward by Tommy Kabu were in many respects identical. For example, their economic projects, involving the revival of a traditional trading system, the purchase of boats and the recruitment of labour, were similar. But

Yali's programme was neither carefully planned nor consistent. Initially he based it on a few clear principles, but his policy was very soon dictated by external developments, and was adapted to the changing pressures to which he himself was subjected. (Lawrence 1964:141-2)

Tommy Kabu's plans were more carefully thought out and his behaviour more consistent. Unlike Yali he did not equivocate over religion and his attitude to Christian missions, but steadfastly insisted on abandonment of traditional ceremonies. The experience of Lawrence with Yali (1964:127, fn.1) suggests that the rationality of Tommy Kabu's ideas should be accepted with caution, but his actions are consistent with a rational approach. Certainly there is an element of revolutionary nationalism in his desire to unite Papua under his own leadership, but he insisted that this must be preceded by economic development.

Apart from the two men's differences in character and experience, other factors may have contributed to Tommy Kabu's greater rationality in Western terms and consistency in planning and action: differences in the cultural background of the Purari Delta and the Rai coast and the absence of cargo cults in the former; differences in the two leaders' relationships with their supporters; and the fact that the headquarters from which Tommy Kabu directed the movement was an urban area - Port Moresby.

Accounts by Holmes and Williams of the epistemology and value system of this region suggest that the Purari as well as people of the Rai coast conceived of a cosmic order which was 'finite and anthropocentric, and as possessing few if any supernatural attributes' (Lawrence 1964:24). Holmes, during ten years' residence, could find no trace of a belief in 'supreme spirits'

(1924:179) and there are no accounts of creation myths. Both Holmes (1924:182-5) and Williams (1923:228) mention that spirits of the dead were thought to return, but there is no record of a belief in ancestral spirits which must be placated because prosperity depended on their good will. There was no tradition of cargo cultism in the Purari area, except for the limited involvement of a few people with the 'Vailala madness' in 1923 (Maher 1961:52). Moreover, in the absence of strong and long-standing Christian mission influence, there was less likelihood of interplay of Christian and traditional beliefs and values such as had helped to determine the development of cultism on the Rai coast. Worsley, citing Allen, says that 'many of Kabu's followers misinterpreted his Christian propaganda for millenarism' (1957:193), which Worsley defines as 'expectation of, and preparation for, the coming of a period of supernatural bliss' (1957:12). While this may have been so, there does not appear to be any evidence to support this conclusion. The adoption of the formalities of Christian worship by Tommy Kabu and his followers appears to have no deeper significance than imitation of European custom, but members of the movement may have believed that by adopting European ways they would acquire some of the European's imunu and thereby gain the power to achieve the goals they desired. His followers may also have believed Tommy Kabu was invested with extraordinary powers: certainly they accepted the rumour that he had married a daughter of the King of England (Allen 1951:3). As mentioned on p.38, when in 1955 some people in the Purari Delta saw that the movement had failed, they began to talk in cargo cult terms but they did not actually start a cult.

Accounts given by Aua Akia and other members of Tommy Kabu's entourage show clearly that while there was an inevitable interchange of ideas between Tommy and his followers, he was clearly accepted as 'the boss' and if his subordinates differed among themselves he was prepared to intervene. He was not subjected, as Yali was, to pressures from a strong 'secretary' such as Kasan (Lawrence 1964:146), nor did he have to compromise his aims to counter the influence of a rival leader as Yali did with Gurek. No system of beliefs was put forward by his followers which influenced or challenged his own. In the Purari Delta there was in 1945 no strong cargo cult which could swamp Tommy Kabu's secular scheme in the same way as the Madang Cargo Movement swamped Yali's rehabilitation scheme.

The one characteristic which distinguished the Tommy Kabu movement from all others was the establishment by the leader of his headquarters in Port Moresby to carry on there the economic activities which Tommy seemed to regard as the most important part of his policy. His numerous projects kept him fully occupied there and he only travelled to the Purari Delta when members of the movement were in difficulties. While he was in Australia

Tommy Kabu lived only in towns. His aim both in Port Moresby and in the Purari villages was that his followers should achieve an urban way of life comparable to that which he had seen in Australia. In Port Moresby he had before him not only the example of Western living standards but also of European activity and enterprise. He sought to adopt Western methods of achieving his ends but when these failed, as for example when he was unable to obtain a site for his operations under a modern form of tenure, he was forced to rely on traditional means.

He continued to organise the activities at Rabia Camp for some years after the collapse of the rural part of the movement. Tommy had political ambitions as an indigenous leader, and was hostile to the European administration because he considered it failed to provide the promised assistance. He did not, however, suffer the feeling of betrayal which overcame Yali after his visit to Port Moresby. In fact, Tommy's prestige was high among Europeans and indigenous people in Port Moresby. According to a government official living in Port Moresby at the time, 'his was a name to be conjured with among Europeans', and many Papuans called him 'King Tommy'. His residence in Port Moresby helped him to maintain the sense of political realism which he had gained from his prolonged observation of Australian power during his service in the Navy.

The Tommy Kabu movement must be studied in the context of the physical destruction, the disturbance of the indigenous population and the disruption of administrative machinery caused by the war. The Provisional Administration of the combined territories of Papua and New Guinea was faced with the problems of reorganising the administration, recruiting and training a new public service based on a small cadre of pre-war officers and framing for the country a new policy in which native interests were to be paramount (Stanner 1953:92). During the period of reconstruction, new-found aspirations of indigenous peoples were expressed in a variety of movements, such as the Tommy Kabu movement and others discussed in this paper. The groups involved in these movements aimed at improvement of their living standards and also at enhancing their status vis-a-vis the white man.

The weakness of the Administration in dealing with these movements was partly due to its lack of clear policies towards them which were followed by all departments. The limitations imposed by the inflexible colonial situation were perhaps more significant. There were no political mechanisms, for example elected representatives in the Legislative Council, by which the Purari could put pressure on the Administration. There was no political party or other organisation which could absorb the movement and represent it at the national level.

This inflexibility also found expression in governmental attitudes towards commercial undertakings which flouted all the principles (such as accuracy in accounting, payment of returns in proportion to the size of contributions, and an impersonal and impartial approach to those involved in the concern) on which modern economic enterprises are based. But as Belshaw points out in his account of the economic enterprises of the Southern Massim (1955:66), behaviour which by Western standards may seem inequitable or dishonest, appears perfectly legitimate to the people themselves. Government officers, whose duty it is to guide such enterprises and who may have some responsibility for the way in which public funds are spent, have to determine how far they should insist that the enterprises are conducted according to modern commercial principles. To strike the balance between over- and under-control, they need to understand the principles on which indigenous social and economic organisation is based.

The story of Rabia Camp after Tommy Kabu returned to his village in 1955 is in the nature of an epilogue. Hitchcock shows in her paper on migration patterns that the Purari have continued to go to Rabia Camp, some to settle, and some to use it as a staging camp while they seek other accommodation (see below, p.61). The reason for this continuing migration does not appear to be that the Purari are now short of the necessities of life. The nutritional state of Koravagi village as described in the report of the New Guinea Nutrition Survey Expedition (Hipsley and Clements 1947:151) was atypical owing to the disturbed conditions obtaining at the time (personal communication by the Officer-in-Charge, Dr E.H. Hipsley). Many satisfactions which the traditional way of life formerly provided can no longer be found and men migrate to earn money to satisfy new needs and to enjoy the interests provided by town life. Moreover, there was no alternative open to them in pre-contact times. Peace and a money economy open up many new opportunities, including that of urban living.

After 1945, the government in Port Moresby, in common with most other governments in developing countries, was faced with the problem of absorbing large numbers of migrants into the urban area. Port Moresby is a 'replica' town in which the colonists have tried to reproduce the conditions, including standards of building construction and urban services, which obtain in their homeland (MacGee 1964:172). As the migrants have insufficient resources to pay for accommodation at these standards and there is no means of closing the gap between building costs and their capacity to pay, the town is divided between the high-grade development areas of the expatriates and the low-grade development areas which are inhabited by the mass of the indigenous population (Oram 1965). Tommy Kabu wished the settlers at Rabia Camp to adopt the way of life enjoyed by residents of the high-grade

development area, but was prevented from achieving this by his failure to obtain the co-operation of the Administration in his efforts. While he and his followers had insufficient resources to build good standard dwellings at the outset, lack of security of tenure, planning, services and encouragement by the Administration deprived them of the incentive to attempt a gradual improvement of their living conditions. In spite of these disadvantages, however, considerable improvement has now been achieved.

As Hitchcock shows, the ethnic groups within the camp form close-knit communities, bound by tribal, village and kinship ties. The link with their areas of origin remains close, and in some respects the Purari living in the camp form an extension of Purari society in the Delta. As a result, the settlers in Rabia Camp, which is considered a slum by many government officials, can be considered to have provided an example of successful adaptation to a new and strange environment. Port Moresby is also a 'replica' town for indigenous immigrants who try to recreate there the social relationships which they knew at home.

Part II

MIGRATION AND EMPLOYMENT

Nancy E. Hitchcock

Chapter 7

Migration and employment, 1963-4

A study of migration and employment patterns at Rabia Camp was carried out in 1963-4. A follow-up study in 1966 has been reported separately in Chapter 8. The assistance given by Mr Tommy Kabu, Mrs Patricia Kiki and the people of Rabia Camp is gratefully acknowledged. Their patience and courtesy at all times were greatly appreciated. Mention must also be made of the advice and assistance given by members of the New Guinea Research Unit, especially by Mr N.D. Oram and by Dr E.H. Hipsley of the Commonwealth Department of Health.

a. Data collection

The study was concerned with 20 Purari houses of the camp.¹ The population of each household was counted on eight occasions in the ten months between May 1963 and March 1964 to ascertain movements in and out of the camp and the extent of wage employment. The time intervals between the counts varied with opportunity. The dates of the counts and the manner in which they are referred to in the following discussion were:

1 (24 May '63) 2 (26 Aug. '63) 3 (1 Sept. '63) 4 (22 Sept. '63)
5 (6 Oct. '63) 6 (20 Oct. '63) 7 (2 Dec. '63) 8 (2 March '64).

On each occasion all details were recorded of sex, age, relationships, village of origin, date of arrival at the camp and whether and where employed. Arrivals and departures between one count and the next were noted together with information on the places to and from which people had come and gone.

b. Population changes

(i) 1963-4. At the first count, in May 1963, the 205 Purari residents at the camp comprised 124 males and 81 females. The

¹ It excluded a Kerema house built amongst the Purari houses, but included the household of a man from Samarai (see p.55).

numbers and the percentage of both sexes in each ten-year age group appear in Table 1. This is represented as a population pyramid in Figure 1. Shorter age intervals than ten years are to be preferred for pyramids, but except in the case of younger children, ages shown are estimates only.

Table 1
Age and sex composition of Rabia Camp, count 1
(May 1963)

	Age group (years)						Total
	0-9	10-19	20-9	30-9	40-9	50+	
Number, male	48	9	21	26	12	8	124
Number, female	33	3	14	21	7	3	81
Total	81	12	35	47	19	11	205
Percentage, male	23.4	4.4	10.2	12.7	5.9	3.9	60.5
Percentage, female	16.1	1.5	6.8	10.2	3.4	1.5	39.5
Total per cent	39.5	5.9	17.0	22.9	9.3	5.4	100.0

The greatest numbers of people in May 1963 were in the 0-9, 30-9, and 20-9 years age groups respectively. Collectively, these numbered 163 persons, representing 79.4 per cent of the total population. There were few persons in the age groups 10-19 years and 50+ years.

Data comparable to those in Table 1 and Figure 1 are presented for the final count taken in March 1964 in Table 2 and Figure 2.

Table 2
Age and sex composition of Rabia Camp, count 8
(March 1964)

	Age group (years)						Total
	0-9	10-19	20-9	30-9	40-9	50+	
Number, male	54	11	27	24	23	11	150
Number, female	43	7	19	21	6	3	99
Total	97	18	46	45	29	14	249
Percentage, male	21.7	4.5	10.8	9.7	9.2	4.5	60.4
Percentage, female	17.2	2.8	7.6	8.4	2.4	1.2	39.6
Total per cent	38.9	7.3	18.4	18.1	11.6	5.7	100.0

AGE STRUCTURE OF RABIA CAMP POPULATION

Fig. 1

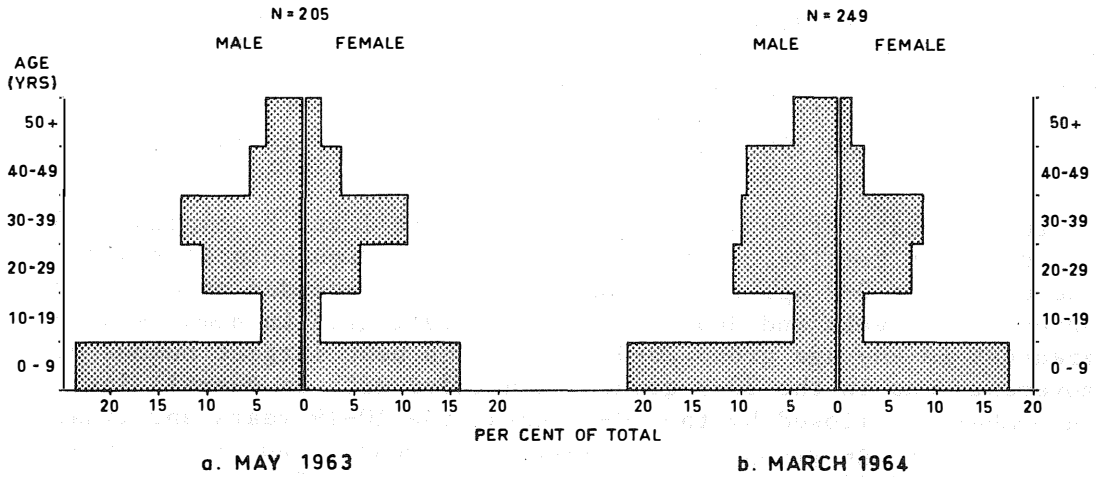
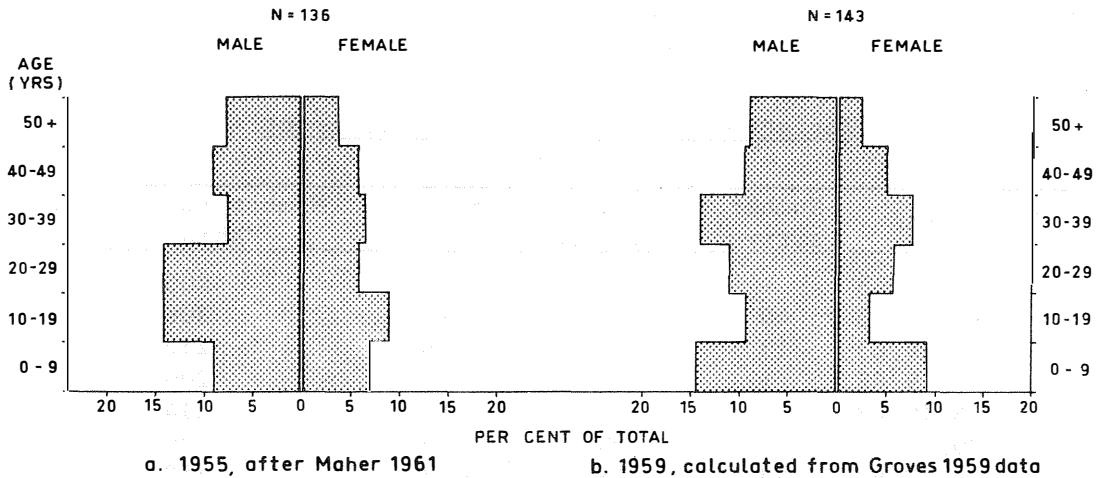


Fig. 2



The number of persons in the age group 10-19 remained small. Age groups 10-19, 20-9 and 40-9 showed small percentage increases while the 30-9 group showed a more marked decrease. The greatest numerical increase was in the 0-9 age group. There was no change in the relative proportion of males and females over the ten months (Tables 1 and 2) but there was an increase of 44 (or 21.5 per cent) in the number of residents at the camp.

The upward trend in population was not regular and at each of two counts there were fewer people than at the preceding count. Over the ten months period the turnover of persons amounted to 166 arrivals and 122 departures, a total of 288. In relation to the cohort in May 1963 this amounts to a turnover in excess of 140 per cent.

The increase of 44 persons between counts 1 and 8 comprised 26 males and 18 females. Two of these were children born to residents. Excluding the 0-9 age group (whose movements depended on moves by parents) arrivals and departures and overall gain in numbers were greatest in the age group 20-9 years. The next largest number of movements was in the 30-9 group which ended with an overall loss in numbers, followed by the 40-9 years, the 10-19 years and finally the 50+ year age group respectively. At count 1 two of the three girls aged 10-19 years were unmarried and under 15 years of age, the third was married and about 18 years old. During the remaining counts, all but one female in this group, either arriving or departing, were young married women aged towards the latter end of the age range. With the exception of three youths aged 14 years or less in count 1, all males in age group 10-19 were single men aged 16 and over.

Table 3
Variation in population at each count

Count no.	Date	Number arrived	Number departed	Increase/decrease	Number resident at Rabia Camp
1	24/ 5/63	-	-	-	205
2	26/ 8/63	40	39	+1	206
3	1/ 9/63	13	7	+6	212
4	22/ 9/63	5	8	-3	209
5	6/10/63	8	3	+5	214
6	20/10/63	16	10	+6	220
7	2/12/63	43	11	+32	252
8	2/ 3/64	41	44	-3	249
Total		166	122	+44	

The greatest numerical changes at any count were brought about by the movement of young families with parents aged 20-49, and

children usually under 10 years of age. All women over 20 were married or widowed. Men over 30 were married or widowed, but several had left their wives in their Purari homes.

The date of arrival of people present at count 1 is shown in Table 4 using the time intervals 1947-9, 1950-4, 1955-9, 1960 to May 1963. A few, particularly older people who had arrived between 1947 and 1949, had not lived permanently in their home villages for as long as 20 years prior to coming to the camp. Some of the younger people had lived elsewhere in Port Moresby or other urban centres of Papua (through wage employment) before their arrival at the camp, but this experience rarely exceeded a year. Most had come to the camp on first arrival in Port Moresby. The table indicates the date at which residence commenced at the camp.

Table 4

Arrival dates at Rabia Camp of count 1 population

Time interval	1947-9	1950-4	1955-9	1960-May 1963	Total
No. of persons (all ages)	28	8	36	133	205
Percentage of whole	13.6	3.9	17.5	65.0	100.0

Of the total of 205 persons, 133 (65 per cent) had arrived since 1960. Of the latter, 94 per cent were under 40 years of age, 47 per cent of them being 0-9 years and 41 per cent 20-39.

Table 5 shows the percentage distribution by date of arrival and age groups of the 205 persons in count 1.

Table 5

Percentage of age groups by date of arrival

Date of arrival	Age group (years)					
	0-9	10-19	20-9	30-9	40-9	50+
1947-9	-	16.7	14.3	15.0	47.4	45.4
1950-4	1.2	8.3	2.9	2.1	5.3	27.3
1955-9	22.2	8.3	5.7	23.4	21.0	-
1960+	76.6	66.7	77.1	59.5	26.3	27.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

While most of those in the younger age groups had arrived since 1960, almost half of those aged 40 and over had arrived at or immediately after the time the camp was established (i.e., 1947-9). A small percentage of young people, up to about 15 years of age,

have lived almost all their lives in the camp. The majority of children under 9 years of age were born before arrival at the camp, but 26 of the 81 (Table 1) or 32 per cent in this age group were born at the camp, 19 of them after 1960. Only one in the 10-19 group was born at the camp. The others were all born in home villages or other areas where the parents were then living.

Twelve of the 20 heads of households arrived between 1947 and 1949 and had lived continuously in the houses which they had built for themselves. Seven of the eight who arrived after 1949 (one during 1950-4, five during 1955-9, two during 1960-4) acquired houses from previous holders and one built a house for himself. Some of them lived in the camp in other households for some time before acquiring a house. According to Tommy Kabu, no cash payment was ever made when houses were transferred.

At count 8, the heads of four households had changed since count 1. This represents a turnover of 20 per cent in ten months. Two men who had been away 18 months and several years respectively resumed occupation and headship of the houses in which they lived before they went away. During their absence, one of the 'guests' had assumed the status of head of the household, and on their return reverted to the previous role. Another householder who arrived in 1958 had left the camp to live with friends in another part of Port Moresby and one of the people who had been living with him in the house for some years became head of the household. The fourth (who arrived after 1960) moved to another camp household with which marriage ties had recently been established. His former house was occupied by a distantly related family which had lived since arrival in 1963 at another part of the camp.

(ii) Prior to 1963. Age and sex composition of the 136 people at the camp in 1955 are shown in Figure 2 (after Maher 1961). The sex ratio favoured males as it did in the 1959 and 1963 counts (Figures 1 and 2). In 1955 there was a higher proportion in the 10-19 years and 20-9 years groups than in the following periods. Maher does not say so, but one may assume that most of the 10-19 years group were at the latter end of the age scale. The small proportion of children aged 0-9 is noteworthy.

The age and sex composition of the Camp Purari population in 1959 has been calculated from Groves' (1959) data and presented in Figure 2. The total Purari population at that time was 143, resident in 22 houses. There was a greater proportion of older persons (40-9 and 50+) and of persons in the 10-19 group, than at any one of the counts of 1963-4. There was a smaller proportion of children aged 0-9. The 1959 and 1963 populations display the same high proportion of people of both sexes aged 20-39.

It is possible that the small numbers in the age group 10-19 (especially at the lower portions of that group) may be due to

the fact that in the early years most of the residents were single men or men who had left wives in home villages. Children born prior to arrival at the camp in its early years have largely passed out of this 10-19 group and many of those born at the camp or arriving later have not yet reached it. This view is supported by Maher's (1961) observation that most marriages in the camp in 1955 were made after 1947.

Of the population of 143 in 22 houses in 1959 only 60 (42 per cent) were still resident at the camp in 1963 (count 1), 44 (31 per cent) had returned to home villages, 26 (18 per cent) had gone to live in other parts of Port Moresby (in particular Hohola, Kaugere, Boroko or a labour compound), 8 (6 per cent) were living away from Port Moresby, 4 (3 per cent) had died and one was in an isolation hospital at Gemo Island.

Of the 60 remaining at the camp, 15 were heads of households in 1959. Thirteen of these were still heads of households in 1963, and with their wives and children totalled 40 of the 60 persons. Two had assumed guest status in other households, one from being widowed and the other had divorced and remarried. Two who were 'guests' in 1959 had become heads of households in 1963, one having in the meantime married while the other had brought his wife from Purari. Both had become heads of the house in which they were formerly guests, following the departure from the camp of the previous householders.

Sixteen persons who were guests in 1959 remained guests in 1963 - 14 of them with the same household group. Of the 16, four were single men in both 1959 and 1963, and the others were either family groups or men married between 1959 and 1963.

c. Migrations

Most persons arriving at the camp after count 1 and up to and including count 8, came from their home village (in most cases a Purari village, but in some cases another part of Papua such as Rigo or Kairuku). Some came from other parts of Port Moresby including both private housing areas and commercial labour compounds. A few came from such places as Gemo Island hospital, the Brown River (15 miles from Port Moresby) and Rabaul. The destinations of those leaving can be similarly described, though a small number died. These percentage distribution of all arrivals and departures (counts 2 to 8) under each of the above categories was:

Arrivals

	%
From home village	41.7
From other parts of Port Moresby	34.0
From other areas	24.3
	<u>100.0</u>

Departures

	%
To home village	32.1
To other parts of Port Moresby	52.6
To other areas	10.8
Deceased (1.8%), hospital (2.7%)	4.5
	<u>100.0</u>

Those leaving the camp included some recent arrivals as well as some who had been living at the camp since before the first count date, and some 'permanent' residents of the camp returning to their home village for a visit.

Many of the recent arrivals from home villages came with a cargo of sago to sell. Some of them returned to the village, but many stayed on at the camp. Some soon left to go to other parts of Port Moresby to live with relatives (usually domestic servants or other workers who were provided with accommodation), or to live where employment had been obtained. Similarly, of those arriving at the camp from other parts of Port Moresby, some stayed, some returned to their villages after a few days or weeks at the camp, and others left to live again in a different part of Port Moresby. Many of those who came to the camp from other parts of Port Moresby did so because of loss of employment entailing loss of accommodation. There was a greater flow of people from the village to Port Moresby than in the reverse direction.

d. Tribal origins of immigrants

The Purari people of the Delta area comprise six tribes: Baroi, I'ai, Kaimari, Koriki, Mapua and Vaimuru. The Koriki and I'ai tribes are the largest (Maher 1961:105) and all people at the camp came from one of these two. In compiling data on place of origin the tribe has been used in preference to the village.¹

The tribal origins of heads of households and their wives are as follows:

¹ With the reorganisation that accompanied the Tommy Kabu movement of 1946 many of the villages of each tribe changed their locations to better sites. Some villages were split into groups, organised mainly along the lines of the ravis (see p.11).

Head of household's origin	Wife's origin (tribe)	Frequency
Koriki	Koriki	7
Koriki	(Rigo (non-Purari)	1
Koriki	(Baruni (non-Purari)	1
Koriki	Kerema (non-Purari)	2
Koriki	I'ai	1
I'ai	I'ai	5
I'ai	Hula (non-Purari)	1
I'ai	Kairuku (non-Purari)	1
Samarai	Kairuku (non-Purari)	1
		<u>20</u>

The household of the man from Samarai was included in the survey with the Purari houses since visitors from Purari stayed in the house and it appeared to be accepted by the Purari segment of the camp as one of their own houses.

Of the 71 persons in the householders' domestic units at count 1, 41 were Koriki, 22 I'ai and 8 Papuans from other areas (including 6 wives of Purari men). There were also 134 additional persons, of whom 77 were Koriki, 46 I'ai and 11 other Papuans having blood ties with the Papuan wives of the heads of the houses in which they were living. Those other Papuans who arrived between counts 2 and 8 were not all blood relations of householders' wives, but in some cases had affinal links with them. Table 6 shows the tribal origins of residents of Rabia Camp at count 1 by whether or not they were members of the householders' domestic units. It also gives arrivals and departures between counts 2 and 8.

Table 6

Origins of Rabia Camp residents

Origin	Household unit at count 1	Other residents at count 1	Arrivals counts 2-8	Departures counts 2-8*	Increase
Koriki tribe	41	77	80	57	23
I'ai	22	46	57	36	21
Other parts of Papua-New Guinea	8	11	19	19	-
Total	71	134	156	112	44

* These figures include many also enumerated as 'arrivals' between counts 2 and 8, and some who were part of the householders' units or otherwise a resident at count 1.

e. Household composition and domestic arrangements

At each count a family unit of some description resided in each of the 20 Purari houses of Rabia Camp. Only two households consisted of a single primary family. The types of additions to the primary family included other primary families, single or widowed men and women, and married persons whose spouses lived in the home village. Some of the widowed and married visitors also had children with them.

In some houses the section occupied by the household head and his family was partitioned off from that occupied by other residents. But in most cases all residents shared the whole area. In instances where the household head had a private section of the house, food was cooked separately for the various family units. Where there was no partition, food was usually cooked at one hearth, and distributed by the woman of the unit that had provided the food.

Although the population increased from 143 to 249 between 1959 and 1964, the number of dwellings decreased from 22 to 20. According to Tommy Kabu, five of the houses at the present camp site were moved from the previous Kaugere site and re-erected without alteration. Seven had had extensions to the former structure, either when the move was made or between that time and 1963. Six houses had been newly constructed on the present site and three of them had already had extensions added. One house from the old site had been divided into two, and additions had been made to both. Some of the re-erected dwellings were later demolished and the materials used for extensions to some of the other houses.

Work had started on an additional timber framed house, but it was held up for lack of funds and building materials. Another small dwelling was finished just after the present study and was then occupied by the head of one of the other households. His former house was occupied by several persons from several other dwellings.

It is not possible to say whether there was any increase in house areas between 1959 and 1963 to accommodate the larger number of persons. Between May 1963 and March 1964, however, the average space available per person did decrease.

f. Relationships within households

At count 1, of the 134 persons not belonging to the family unit of the head of the household, 66 (49 per cent) were related to householders, 44 (33 per cent) to their wives, 6 to other persons living in the houses who were affinally related to the householder or his wife, and 18 were not related to any person in the house in which they were resident, although they may have had relatives in other households. During the ten months in which the counts were taken the percentage of persons arriving and departing who were

related to the head of a household on the one hand or to his wife on the other remained broadly constant (50 and 21 per cent of arrivals to 46 and 21 per cent of departures respectively). However, the number of arrivals of persons related only affinally to some resident of a house greatly exceeded departures. While at the first count there were only 6 (4.5 per cent) affinally related, 40 (25.6 per cent) arrived and only 20 (17.8 per cent) departed during the subsequent counts. Persons claiming no relationship to anyone in the house, but one to persons in houses in which they were not resident, showed 17 (15.2 per cent) departures against 4 (2.6 per cent) arrivals. The number of non-relatives staying in any household appeared to depend on what space remained after the cognates and affines were accommodated, as well as on what bonds (blood relation, same tribe, or just friends) existed between the household head or his wife on the one hand and the other residents at the camp who shared a relationship with the intending guest on the other.

Most houses contained persons with a common tribal origin. In nine of the 12 households in which the head and his wife were of the same tribe (i.e., either both Koriki or both I'ai) all the other residents at any count were also of the same tribe. In the remaining three households two at some time had a male resident accompanied by a wife from another district of Papua while the third contained a young recently arrived Koriki man and his I'ai wife. Koriki and I'ai residents were mixed in only two other houses.

In six mixed households, where the wife of the Purari householder came from another district of Papua, other residents were of the same tribe or village as the householder or his wife or both, or were from a different area from all other residents in the household, but were related affinally to the householder's wife. In two households, the wives of the heads were daughters of Purari men and Motu women. At no time did any relatives from their mothers' villages reside in these women's houses, although people from their fathers' Purari villages did so.

Changes of residence were always made from a household whose occupants were of the same tribe as that of the person changing, to another household of people of the same tribe. In 11 out of the 13 such changes made between counts 1 and 8, the moves were between households containing relatives. In the other two instances, the move was from a house where there were no relatives, to one where such ties existed.

These 13 changes involved a total of 32 persons of all ages and both sexes. Seven changes were by single men, or married men whose wives and families remained in the village of origin. The other 25 were family units (husband, wife and children) or part of a family unit (father and children). Precise relationships of

householders to one another were not ascertained, but although some had come from the same villages as others it appeared that they were not close relatives. Cognatic and affinal relationships existed between some householders and residents in other houses, but the closest relationships were those between the head of each household and the guests residing there.

g. Employment

At count 1, there were 65 men of working age residing at the camp. Twenty-six (40 per cent) were unemployed. The remaining 39 men and one woman (total 40) were employed for wages. Their occupations were unskilled or required minor mechanical skills and included labouring (digging drains, concrete mixing, stevedoring), driving vehicles, store work, domestic service and assisting in a bakery.

The 26 unemployed and 40 employed persons at this count had varied employment histories during the following seven counts. Of the 43 potential workers who remained to count 8, 18 were employed and three unemployed for the entire period. The remaining 22 were employed part of the time.¹ Except for two households each containing one primary family only, there was one or more persons working for wages at most times.

Mobility was high, and of the 65 potential male members of the work force at count 1, 23 left the camp between the first count and the last. Seventeen of the 23 had left by the second count, one between counts 2 and 3, and five between counts 7 and 8. Persons who arrived and left between counts 1 and 8 also had a varied employment history.

Table 7 summarises the employment record at each count, excluding any who arrived after count 1.

Table 7
Employment record and departures, counts 1 to 8

Count	1	2	3	4	5	6	7	8
No. of employed	40	33	31	31	31	35	38	32
No. of unemployed	26	16	17	17	17	13	10	11
Total	66	49	48	48	48	48	48	43
Departed		17	1					5

¹ Four were unemployed for one count period, three for two, four for three, two for four, two for five, five for six and two for seven.

Those who were employed for the whole period were in most cases with a single employer. For the others, periods of employment alternated with period of unemployment. Of the 18 men employed for the whole period, six were heads of households. Other heads of households ranged from one period of unemployment to total unemployment. Neither the fact of being a householder or otherwise, nor duration of residence in the camp appear to be correlated with employment.

Between counts 2 and 8, 71 men of working age arrived and 19 departed. These men displayed a similar variety of employment to that of persons present from counts 1 through 8. At the count taken following the arrivals of these persons, 37 were employed and 34 unemployed. In some cases, however, a new arrival had had only a few days in which to find employment before being classed as unemployed at the next count. Of the 71, there were 18 who did have paid work while the counts were being taken. The other 53 had employment at some time.

Only two women were engaged at any time in paid employment during the study, one as a seamstress, the other as a laundress, but in both instances the employment amounted to only a few weeks.

Chapter 8

Migration and employment, 1966

In February 1966 a follow-up count was conducted, recording the same kind of information as in the counts of 1963-4.

a. Population changes

Between March 1964 and February 1966 the population rose from 249 (Table 2) to 326 (Table 8), an increase of 30.9 per cent (77 persons). The proportion of males to females differed little from that of previous counts (see Tables 1, 2, 8). As in previous counts, the greatest numbers of people were in the age groups 0-9, 20-9, and 30-9; collectively they represented 76.4 per cent of residents. The movement of young family groups (parents 20-49 years, children 0-9 years) again accounted for much of the change between 1964 and 1966, and the birth of 22 infants at the camp increased the numbers under nine years. Some of the increase in the 20-9 years age group was due to the arrival of 20 single men and few departures. Several of those aged 0-9 in 1963-4 moved to the next age group, increasing the percentage in that group. The majority aged 10-19 were in the lower age range.

Table 8
Age and sex composition of Rabia Camp
(February 1966)

	Age group (years)						Total
	0-9	10-19	20-9	30-9	40-9	50+	
Number, male	66	18	45	29	27	4	189
Number, female	54	15	26	29	12	1	137
Total	120	33	71	58	39	5	326
Total per cent	36.8	10.2	21.8	17.8	11.9	1.5	100.0*

* Of this, 58 per cent were males, 42 per cent females.

As nine people aged 50+ years had departed,¹ the percentage of people under 40 years of age had risen from 82.7 per cent in March 1964 to 86.6 per cent in February 1966.

Since the 1964 count, 86 persons had departed and 163 had arrived and were living at the camp in 1966. Persons who both arrived and left in the intervening period were not recorded.

b. Housing

The increased number of residents were largely accommodated in newly built houses. The 20 houses that formed the camp in 1963-4 accommodated only nine (3.6 per cent) more people in 1966 than in 1964. All 86 persons who had departed since 1964 had left the original 20 houses. In February 1966 there were ten new houses whose heads were from the Purari and one new house whose head was from Orokola (Kerema) but who had affinal ties with a Purari resident of the camp and who had Purari people living in his house. Seven of the original 20 houses had been extended by the addition of a verandah or a room or both. Some of these additions, like most of the new houses, were of adequate building materials, but others were constructed of scraps of timber, rusted iron and hessian. Two small rooms of hessian had been removed from under one house since their former occupants had gone to new dwellings.

c. Migrations

The places from which people arrived and to which they departed in 1966 were similar to those of the previous counts of 1963-4.

<u>Arrivals</u>	%
From home village	46.1
From other parts of Port Moresby	43.3
From other areas	10.0
	<u>100.0</u>
<u>Departures</u>	%
To home village	46.5
To other parts of Port Moresby	33.7
To other areas	11.6
Deceased (7.0%)*, hospital (1.2%)	8.2
	<u>100.0</u>

* Three of these were 50+ years of age.

¹ Three had died, four returned to the village and two had gone to live elsewhere in Port Moresby.

The arrival of people from the villages continued to exceed departures to the villages, as in earlier counts. To many people the camp provided temporary accommodation but the erection of new houses indicated that some of the recent arrivals expected to remain.

d. Tribal origins

Purari tribal origins were the same as in previous counts: Koriki - 184 and I'ai - 117. The 26 non-Purari residents were from several villages in the Central District of Papua (20), from Samarai (one) and from Kerema (five). All householders (except the two from Kerema and Samarai) were Koriki or I'ai. The other non-Purari people were the wives of these, the relatives of Papuan wives or were unrelated.¹

e. Duration of residence of heads of households

Of the 20 houses of the 1963-4 counts, only one household head had changed. He was an old man resident at the camp since 1947, and in the Port Moresby area since 1923, who had returned to the Purari. The new householder was a relative who had been at the camp since 1959. The heads of the newly built houses had arrived in 1947 (two), 1958 (one), 1963 (three) and 1964-5 (five). This had resulted in a change in the proportion of householders who were of long residence. In the 1963-4 counts 90 per cent of householders had arrived before 1960. In 1966 this had been reduced to 68 per cent.

f. Relationships

The family units of heads of households numbered 129. Of the other 197 residents, 62.9 per cent (124) claimed relationship with the head of the household, 20.3 per cent (40) with his wife, 3.1 per cent (six) with others living in the houses at this time. There were 9.6 per cent (19) who were not related to anyone living in the house more closely than having the same village of origin, but they were often related more closely to former residents of the house. There were 4.1 per cent (eight persons) living in houses in which they were related to no one.

There were ties of various kinds between the new houses and the old. Some were affines, others simply from the same original

¹ The latter group included five Goilala young men and a Koiari (Central District) man and his wife, all living in one household. All the men either were or had been working with the head of the household on contract work and had been permitted to live in his house.

village. Four of the new householders had all been living in the house of their mutual relative for the whole of the 1963-4 period and for some years before that. The other new householders had lived in households to members of which they were related, from their arrival at the camp until their houses were ready to be occupied.¹

g. Employment

The work force in 1966 comprised 104 men, 87 of whom were employed on the day of the count. Three of the 17 unemployed were visitors with sago to sell, and three were sometime wharf-labourers who were not employed on the day of the count.

The work was usually unskilled. Most men received wages fortnightly and earnings claimed ranged from \$9 to \$78,² excluding contractors who received more but had to pay wages to their employees.

There were no women employed for wages in February 1966, although several earned money from the sale of hand crafts.

¹ This applied also to a Goilala household not included in the count. The head of this household and his family had stayed in the house of the friend who had invited them to build at Rabia Camp.

² This is the amount received last payday, including overtime, and irrespective of whether they had worked the full pay period.

Chapter 9

Nutrition

A study of nutrition at Rabia Camp was carried out concurrently with the employment and migration study in 1963-4. It was commenced with the aid of funds provided by the South Pacific Commission for a study of energy (food) intake and expenditure, to offer a comparison between an urban group and the rural groups in highland New Guinea and coastal Papua previously studied (Hipsley and Kirk 1965). This study embraces descriptive, and where possible, quantitative data, of food consumption levels (and the practices of producing, purchasing, cooking, etc.) and the economic status of a number of the families living in one of the urban settlements of Port Moresby. The survey was expanded to cover the economic background to the dietary intakes as revealed by details of income and expenditure, employment and migration patterns.

Most nutritional studies in Papua and New Guinea have been conducted in rural areas: Hipsley and Clements (1947), various reports of Hamilton (1956), Venkatachalam (1962), Oomen and Malcolm (1958), Whiteman (1962a) and Hipsley and Kirk (1965). These have been concerned either with family group dietaries or the food intakes of special groups within the community such as pregnant and lactating women. The only published data on urban diets are from Hamilton and Wilson (1957) on Malaguna in Rabaul, and Whiteman (1962b) on Hohola, a suburb of Port Moresby.

a. Method of study

The nutrition study was carried out in two parts. The first, field work for which was carried out from March to May 1963, comprises dietary and budgetary data for selected households of Purari people resident at Rabia Camp. The second, in November 1963, comprises information on budgets, quantities of food bought, and number of persons among whom it was distributed, and gives an indication of per capita food consumption.¹

¹ The two periods will be called part one (to cover the study in March to May 1963) and part two (to cover the study in November 1963).

(i) Selection of sample. For part one of the project, ten Purari houses out of a total of twenty were selected at random for study. Three random substitutions were made to replace households which did not participate fully. The individuals studied comprised 18 men, 7 normal women, 3 pregnant women, 6 lactating women feeding infants ranging from approximately nine to eighteen months and 22 children between the ages of two and fourteen years.

For part two, a sub-sample of six households was selected from the part one sample. These six were randomly chosen from the seven which had participated fully in the first instance. Further houses needed as a result of the failure to co-operate on the part of any householder were selected first from the remainder of the seven, and then from the three substitutions.

(ii) Collection of data. All data were collected with the assistance of an English-speaking woman who had been born at Rabia Camp and lived there until marriage a few years before. She had a Purari father and a mother from Keapara (Kerebuna) but spoke no Purari language although she understood some. She interviewed in Police Motu (the lingua franca of the camp) and translated into English for the investigator.

Qualitative observations of foodstuffs used, methods of cooking, eating times, cultivation, harvesting and purchase of food were made both before and during the quantitative study.

Food consumption. Quantitative data on food consumption by individual in each household were obtained in part one. It was intended to weigh all foodstuffs consumed at each mealtime, but as the investigator did not live at the camp this proved impractical because of unpredictable variations in mealtimes between households and from day to day. Quantitative data on food intakes were obtained therefore by recall, and by weighing where possible. Each household was visited once daily for a week. On alternate days all food and fluids¹ consumed by each member of the household at home, away from home, at and between meals were noted in household measures (e.g., tablespoons or cups and converted to a weight measure) or by weighing a similar portion of the same foodstuff. Visits were made daily to satisfy the investigator that the alternate days were representative.²

¹ Fluids at the camp were drunk from cups dipped into water containers (there was no piped water) but when men were away working fluids were also taken directly from taps or from hands and only a rough estimate could be made of fluids obtained in this manner.

² Assessment of quantity of food was relatively easy because of the limited range of foods used, because often all the food contained in a package of standard weight was prepared at once, and because

In part two of the study the weights of various foodstuffs used in the selected households were recorded. Where the weights were not known (e.g., garden produce, market purchases, gifts) they were estimated by weighing a similar quantity.

Pattern of activity. At each visit (part one) the activities of men and women in the household were recorded for the previous day. An estimate of the duration of many of these activities was made from observations at the camp.

Infant feeding patterns. Information was sought on infant feeding customs (part one) from women at the camp (irrespective of whether they formed part of the sample) who were still feeding infants or who had only recently ceased to breast feed. The questions covered age at which solid foods were introduced, the nature of this solid food and its method of preparation and the frequency with which these foods were given. This material appears as Appendix 1.

Heights, weights and skinfold thicknesses. The heights of all subjects (except infants) from whom dietary data were obtained in part one were measured to the nearest quarter inch with a flexible steel tape. The height was read by placing a board on top of the head at 90° to the tape. Weights were measured to the nearest pound with an accurate platform spring scale. Skinfold thicknesses were measured with special calipers manufactured to the specifications of the Medical Research Council (U.K.) by British Indicators Ltd, St Albans. The site selected was subscapular and an average was taken of five readings from it.

Income and expenditure. Records of income and expenditure, and of food, clothing and other items entering or leaving the house, were collected by interview, concurrently with the dietary information for the week of part one of the survey. In part two, month-long records were collected on alternate days from three of the households and records of a shorter duration from the others who tired of interviewing before the end of the month. An estimate of per capita food consumption was made from the numbers of persons present at each meal and the quantities of food available and eaten. The nature of irregular income and expenditure which did not arise during both parts of the study was noted, but it was not possible to assess its magnitude.

(iii) Calculation of nutrients. Calculations of nutrient intakes vary in accordance with differing values assigned to particular

2 (continued)

there was almost no food storage. For comparison of the accuracy of recall as against weighing in a developed society, see Young 1952.

foodstuffs in different food composition tables. For example, sweet potato contributes 80 per cent of food calories in Chimbu (New Guinea) diets so the food values selected for sweet potato in this case are the critical ones when assessing nutrient intakes.

For bread, rice and flour (the major contributors of calories in Rabia Camp dietaries) and for most other imported foods, the food values given in Tables of Composition of Australian Foods (Osmond and Wilson 1962) were used. For most indigenous foods the Tables of Composition appearing in the Report of the 1947 New Guinea Nutrition Survey (Hipsley and Clements 1947) have been used. The sources of food values and the figures used in calculations appear in Table 9. With the exception of bread, canned fish and canned meats, calculations of nutrients have been based on raw weight. Although weights of starchy roots, bananas and other vegetables were estimated as cooked, the calculations were based on food values for the raw foodstuffs. Weight changes occur during cooking, but experimental weighings of sweet potato and yam before and after cooking by different methods indicate that there is the least amount of weight change when they are boiled - a loss of the order of 5 per cent (Hitchcock 1963). Vegetable foods contributed only a minor proportion of the calories in Rabia Camp dietaries and any underestimate on this account would be slight.

Products made from wheat flour, sago or rice were weighed after cooking, but calculations of nutrients were based on converted dry weight figure. Allowance was made for water used in preparation or absorbed during cooking.

No allowance was made for nutrient losses during cooking. Most food was boiled in a large volume of water and leaching may therefore have been considerable. Cooking water was discarded more often than it was consumed, except in the case of rice which absorbed the water.

(iv) Calculation of income and expenditure. Food gifts and food harvested from gardens have been given a money equivalent based on prices prevailing at Koki market and those stores most frequented by Rabia Camp people. Actual prices were recorded for all other items.

b. Procuring of food

(i) Agriculture. There was little gardening land available at Rabia Camp, but an area of hillside behind the house was divided into plots (sometimes fenced, but usually not) tended by the various households. Plot size varied considerably and some small gardens were made in front of and between a number of the houses. Most of the available land was in use and two of the ten sample households had no gardens.

Table 9
Composition of foods/100 g food*

Food	H2O g	Prot. g	Fat g	Cals.	Ca mg	Fe mg	Carotene I.U.	Vit. A I.U.	B1 Thiamine mg	B2 Riboflavin mg	Niacin mg	Vit. C mg	Fibre mg
Sweet potato	67.3	0.9	-	150	15	0.8 ^c	-	-	0.13	0.05 ^c	0.7 ^c	31.3	0.5
Taro	63.9	1.4	-	145	39	1.0 ^c	30 ^c	-	0.1	0.03 ^c	0.4 ^c	6.2	0.6
Cassava	60.0	0.7	-	131	25	0.8 ^c	-	-	0.02	0.08 ^c	0.6 ^c	30.0	1.5
Bananas (cooking and ripe)	75.0	1.1	-	94	8	tr ^c	400 ^c	-	0.05	0.08 ^c	0.6 ^c	19.9	0.3
Sago	16.9	0.1	-	349	10	0.7 ^a	-	-	-	-	-	-	0.1
						(tapioca)							
Corn on cob ^a	74.0	3.7	1.2	102	9	0.5	390	-	0.15	0.12	1.7	12.0	0.8 ^d
Pumpkin	88.0	1.5	-	44	20	0.7 ^a	1,500	-	0.04	0.08 ^a	0.6 ^a	10.0	1.2 ^d
Papaw	87.0	0.5	-	45	20	0.3	1,660	-	0.045	0.04	0.3	80.0	0.9 ^d
Native cabbage/ spinach (Aibika)	82.7	5.7	-	45	580	3.0 ^a	9,000 ^a	-	0.15	0.20 ^a	0.6 ^a	60.0 ^a	1.8
Pumpkin tips	90.0	3.8	-	26	80	3.0 ^a	9,000 ^a	-	0.15	0.20 ^a	0.6 ^a	18.0	1.6
						(spinach)							
Canned fish** ^a	63.1	20.7	12.4	200	100	1.5	-	-	0.045	0.12	2.2	-	-
Fish, non-fatty ^a	77.6	18.3	2.8	103	34	1.0	-	-	0.06	0.12	2.2	-	-
Shellfish, crab, misc. shells ^a	73.0	20.0	4.0	126	45	1.0	-	-	0.14	0.06	2.3	-	-
Pork, lean ^a	44.0	10.0	31.0	334	5	1.4	-	-	0.430	0.11	2.3	-	-
Coconut water	94.8	0.2	0.4	18	30	-	-	-	-	-	-	-	-
Coconut meat:													
very young nut	92.8	0.7	1.0	31	21 ^c	2.0 ^c	-	-	0.11 ^c	0.01 ^c	0.2 ^c	3.0 ^c	2.4
mature nut ^c	14.0	5.7	50.0	439	24	2.0	-	-	0.11	0.01	0.2	3.0	3.2
Coconut cream ^c	52.0	4.0	27.0	345	10	1.0 [#]	-	-	0.05 [#]	0.005 [#]	0.1 [#]	1.5 [#]	-
Canned meat ^a	64.1	14.5	10.8	179	26	1.3	-	-	0.03	0.14	2.9	-	-
Flour, white, wheat ^a	12.0	10.0	1.5	362	20	1.4	-	-	0.167	0.02	1.2	-	-
Bread, white ^a	37.0	7.4	1.3	254	14	1.0	-	-	0.097	0.03	0.9	-	-
Rice, white ^a	13.0	5.7	0.5	353	24	0.8	-	-	0.30 ^{##}	0.03	1.6	-	-
Rice, brown ^a	10.0	5.7	2.2	360	39	2.0	-	-	0.30	0.05	4.6	-	-
Butter ^a	16.0	1.0	81.6	739	15	0.1	1,600	2,400	-	0.01	0.1	-	-
Margarine ^a	14.0	-	85.3	768	4	0.3	-	2,000	-	-	-	-	-
Fresh meat (beef) ^a	59.5	17.5	22.0	272	10	2.6	-	-	0.08	0.16	4.2	-	-

Data sources:

Hipsley and Clements 1947, except where otherwise indicated.
^a Osmond and Wilson 1962.
^b Platt 1945.
^c Massal and Barrau 1956b.
^d Bowes and Church 1952.

Notes:

* Edible portion, raw weights.
 ** All values for plain tinned herring.
[#] Values taken as 50 per cent of mature nut.
^{##} Fortified with 300 mg thiamine per 100 g rice.

Each garden was cultivated and harvested mainly by one person, usually the wife of the head of the household, but in several cases it was done by old men.¹ The crop was the property of the gardener. Most of the larger gardens were made soon after the camp site shifted from Kaugere, and have been producing constantly since. In 1963 most of the starchy root crop was cassava (at least three varieties) but there were also some sweet potatoes, yams, pumpkins, corn, watermelons, a few taro and Chinese taro, bananas and papaws. Aibika (native cabbage) was grown mostly in gardens close to the houses.

Although some replacement planting was going on all the time, much of the tuber planting was done immediately before the 'wet' season in 1962 (approximately November) and some just before the study began in March 1963.² There was not much harvesting from these gardens during this study and their yield is unknown. The soil was shallow and stony and of poor quality.

(ii) Fishing. Although a few men owned fishing arrows, bows or spears of the type traditionally used in the Purari Delta (see Williams 1924) these were not in good repair and no fishing was done between March and May. At other times, infrequent fishing excursions had been made to Gaile, some thirty miles east of Port Moresby, when a truck was available.

Some women occasionally collected up to fifty shellfish from the rocks or mud of the foreshores at low tide, but as the shells were less than an inch in diameter the fish were very small.

(iii) Cash purchases. These came mainly from the two trade stores in nearby Kaugere and from Koki market. The trade stores all kept flour, rice, sugar, salt, tea, bread, 'navy bread' and other biscuits, butter, dripping, sweets, a variety of tinned meats and fish, kerosene, and a little clothing. One Kaugere store had refrigeration and sold frozen meat, ice cream and imported fresh fruit.

The price of the foods most commonly purchased was much the same at two Kaugere stores but rice, flour and some other foods could be bought in larger quantities at lower prices elsewhere. The trade stores generally required cash for all transactions.

¹ In the Purari villages, clearing, planting and harvesting gardens was normally done by men, while the women usually undertook sago making and fishing.

² Two of these gardens were again prepared for planting in October 1963 while a third had already been replanted with sweet potato. During the 'dry' season (May-November) 1963, cassava was replanted as used.

Koki market is about one mile from Rabia Camp. Canoes bring fish and other supplies but 90 per cent of vegetables come by truck from Rigo and Sogeri (Spinks 1963a) and much betel nut comes by air from the Kairuku area. Small quantities of pig and wallaby meat were also sold at the market.

Goods were usually divided into ten cent (one shilling) lots and bargaining was quite unusual. The quantity supplied for ten cents varied within wide limits. For example, on visits to Koki market between March and May 1963 weighings of ten cent lots showed sweet potato ranging from $1\frac{1}{2}$ lb to $2\frac{1}{4}$ lb and pumpkin between $1\frac{1}{2}$ lb and $2\frac{1}{2}$ lb. Cooking bananas, varying in size, were approximately twelve for ten cents. The commodity in greatest supply at all times was the banana.¹ Fishermen usually returned with their catch in the afternoon and many people therefore came to the market after work.

Peddling of fish was always infrequent at Rabia Camp and buying even less so, but both were more frequent during November than May. On one occasion during the survey sago was sent from the Purari Delta to a relative at Rabia Camp to sell but more was bought by people in nearby Kaugere than by camp residents. Rabia Camp residents made little use of the cafes in the Koki market area and only on one occasion during the survey was a purchase of food from a cafe recorded.

(iv) Food exchanges and gifts. Food exchanges between kin of different 'hearths' (i.e., groups cooking and eating together) were common but usually small in quantity. They consisted of a portion of the food cooked for the main meal and were taken by the donor to the recipient. A similar gift would be returned, either on the same day or within a day or two, on the plate on which the original gift was brought. When uncooked foods were presented the quantity was larger, e.g., a few pounds of sago. The largest number of exchanges observed involved small amounts of food (such as one or two spoons of rice) within one household containing five separate but related hearths. Exchanges were fewer between households consisting of a single hearth. On two occasions gifts of both imported and local foods were made as repayment (two and four weeks after the event) for assistance rendered at funerals.

No festivity involving food exchanges or communal eating occurred during the survey periods, though informants said that food was provided at weddings and arrangements being made for a child's first birthday celebration included a supply of rice and beer.

¹ Which accounts for 39 per cent by weight of the total food brought to the market (Spinks 1963b).

c. Household equipment

Every household possessed a variety of cooking and eating utensils.¹ All households possessed some woven pandanus mats for sitting and sleeping on, cotton blankets, and several brooms made from the midribs of coconut leaves. In two of the ten households there were one or more iron bedsteads and some cotton bed sheets. A minority of households owned mosquito nets and an old cane chair, and most had a small stool. Almost every householder had one gardening implement such as a pick or shovel. Some households also owned a hammer and a few simple carpentry tools.

d. Food preparation and cooking

Cooking fires were usually made in one corner of the main room, but in some instances a side verandah or a small area divided off from the main room was used.

Firewood was normally gathered by women who felled slender trees or collected fallen branches and chopped them into lengths of two to three feet for carrying home on their backs in bundles weighing forty to fifty pounds. Wood was collected from Boroko, Korobosea and Gabutu, fifteen to thirty minutes walk from the camp. A little firewood was bought from a truck which called occasionally, but it cost twenty cents a bundle, and a bundle used sparingly lasted only three or four days.

The foods used required little preparation. Extraneous stems and other inedible material were removed from greens before washing them. Tuberous roots, bananas and pumpkin were thickly peeled prior to cooking. This was often done on an outside verandah. Tubers were rarely washed before peeling but peeled vegetables were well washed in clean water before cooking.

Fish were gutted and scaled, the larger ones being cut into several pieces. Bread, canned meat and canned fish were eaten without further preparation. Rice was washed two or three times in cold water before cooking and flour was made into cakes.

¹ The range and number of these items varied but in one apparently typical household of two adults and three children, the following utensils were owned and used: 2 enamel bowls (for cooked food), 5 enamel drinking cups, 5 enamel plates, 2 knives, 5 dessertspoons, 1 large enamel bowl for washing dishes, 1 larger enamel bowl for washing clothes, 1 aluminium frypan, 1 aluminium kettle, 3 aluminium saucepans, 1 tea pot and tea strainer, 2 kerosene drums and 2 buckets (for collecting and storing water).

The types of foodstuffs¹ used and the ways they were prepared are described in Table 10. Boiling and roasting (either in or over a fire) were traditional cooking methods of the Purari. Frying has been introduced. All three methods are used in the camp.

Food was boiled in a metal (usually aluminium) pot on a wire grid over the fire. Fresh water was always used and, except in one household, salt was never added in cooking. The food was placed in the pot, cold water added to cover it and sometimes coconut cream. A lid was put on the pot, the water was brought to the boil and kept boiling until the food was cooked. If a variety of foods was cooked in one pot, foods that took longest to cook were placed at the bottom. Bananas were always put below sweet potatoes or cassava but the latter two were mixed. Smaller tubers were placed nearer the top, fresh meat was placed on the bottom, but fresh fish always on top. Fish was often not completely covered with water and was as much steamed as boiled.

If coconut cream was added to the cooking water the liquid was always consumed, being either poured over the food on a plate, or drunk separately from a cup. When no coconut cream was added the liquid was sometimes consumed, but as often discarded even when the same kind of food was cooked. In the case of rice the water was absorbed during cooking. If a thickened soup was made the vegetable ingredients (green leaves, pumpkin) were placed in cold water, boiled till cooked, then the thickening agent (sago flour, wheat flour) added and the mixture was cooked for a little longer.

Roasting was done in a number of ways. Flour cake (wheat or sago) was either placed in a saucepan or pan and put on the grid over the fire, or the cake was placed directly on the grid. In either case the cake was turned at least once during cooking. This food was sometimes wrapped in leaves, usually banana leaves, placed on the rack over the fire and turned once or twice during cooking. This wrapping prevented charring. Flour cakes or unpeeled tubers occasionally were cooked in hot embers. The charred outside was removed before eating.

Wheat flour was the only food ever seen fried. It was made into a fairly stiff batter with water and fried in dripping (on one occasion margarine was used) to make large heavy pancakes.

In the Purari Delta sago is the staple food. Camp people said the two most common of the many ways of preparing it are to make it into a long stick which is wrapped in nipa palm leaves and roasted on a rack over the fire, or to make soup with sago, fish,

¹ Many of these plant foods are described more fully in Malcolm and Barrau 1954; Barrau and Massal 1955; Massal and Barrau 1955a, b, 1956a, b.

Table 10

Foods and cooking methods used

Food	Description	Cooking methods
Sweet potato <u>Ipomoea batatas</u>	Number of varieties from own gardens and from markets. Tubers usually white or cream.	Peeled, covered with cold water and boiled in covered pot. Less commonly cooked in embers. Skin and char scraped off before eating.
Maniot (Cassava, tapioca) <u>Manihot utilissima</u>	At least 3 varieties in gardens. Tubers, white, cream or yellow. Not bought during survey.	Peeled, covered with cold water and boiled in covered pot.
Yam/Taitu <u>Dioscorea sp.</u>	From market. Some cultivated, but none harvested during survey.	Peeled, covered with cold water and boiled, or cooked in embers as for sweet potato.
Corn <u>Zea mays</u>	Some cultivated. Available at market, but not bought during survey.	Husk completely removed, covered with cold water and boiled.
Pumpkin <u>Cucurbita sp.</u>	Cultivated. Flesh bright yellow to orange, with dark green skin.	Peeled, cut into pieces approx. 4" square, covered with cold water, boiled. Or peeled, cut into pieces approx. 3" x ½" x ½", covered with cold water, boiled. When cooked this way sago added to make thick soup. Coconut cream added before eating.
Pumpkin tips <u>Cucurbita sp.</u>	Picked from gardens as required. Never used in large quantity.	Non-edible parts removed then tips put in large amount of cold water, boiled. Cooking water consumed with tips as soup. Or fresh meat placed at bottom of cooking pot, pumpkin tips on top. Cold water to cover meat only, boiled with lid on. Meat and tips eaten with cooking liquor poured over them in plate.

Table 10 (continued)

Food	Description	Cooking methods
<u>Aibika</u> ('native cabbage') <u>Hibiscus abelmoschus</u>	Cultivated. Bush grows to 2-3 feet, leaves dark green and dissected, red veins. Terminal leaves only used.	Coarsely chopped, placed in boiling water and simmered or placed in cold water and coconut cream and boiled. Or, coarsely chopped, placed in cold water with well-washed shellfish and boiled. When cooked in water only, small white flour dumplings may be added to boiling water. In every case cooking liquid consumed.
<u>Sago</u> <u>Metroxylon rumphii</u>	Sometimes received as gift. Not cultivated, rarely bought. Colour varies. Off-white and pink observed. Sago for cooking is a fine flour, slightly damp from incomplete drying.	Sago flour mixed with a little water, to form round cake, or small balls about 2½" diam., ½"-1" thick, cooked, wrapped in banana leaf, on grate or rack over fire. Cake turned once or twice during cooking. Occasionally unwrapped ball cooked in embers. Outside charred and inside drier and harder than when cooked in leaves. Sago flour mixed with little water, to form stick about 1" x 15" or 16" sheathed by two flattened nipa palm leaves, pinned together by 1" long match thin pieces of wood. Baked on grid over fire. Outer layer of sago receiving greatest heat becomes clear and gelatinous, inner sago is dry and powdery, or sago flour added to boiling water to make soup; coconut cream added before eating. Also used with pumpkin in soup (see pumpkin).
<u>Rice</u> <u>Oryza sativa</u>	Imported food bought, white, polished, fortified with thiamine (vitamin B1). Brown only in issued rations.	Washed with cold water 2 or 3 times, put into cold water and boiled in covered pot. All water absorbed during cooking.

Table 10 (continued)

Food	Description	Cooking methods
Canned meat	Imported food bought. Meat and cereal, with appearance of luncheon meat.	Mashed with fork, eaten cold. Or, sliced and fried in its own fat in pan with sliced onions. Eaten warm or cold.
Canned fish	Imported food; mackerel pike canned in natural oil; rarely herrings in tomato sauce.	Whole pieces of fish either eaten cold or covered with thick batter and fried in margarine or dripping.
Meat, frozen	Imported food, bought occasionally, boneless beef frozen pack.	Cut into $\frac{1}{2}$ " cubes, stewed with pumpkin tips (see pumpkin tips).
Bread	Made in Port Moresby from imported flour. Usually 2 lb white loaf, unsliced, sometimes white sliced or brown, and less often sweetened white bread ('scone').	Cut into slices $\frac{1}{2}$ " to 2" thick, eaten with or without butter.
Wheat flour (Wheat - <u>Triticum vulgare</u>)	Imported food, white (low extraction) bought, wheat-meal (high extraction) only in issued rations.	Mixed with water to firm dough, formed into rectangular or circular loaves of varying size wrapped in leaves and put on grate over fire or in embers, turned once or twice during cooking. Broken into pieces for consumption. Or loaves, not wrapped, cooked in a covered saucepan over fire, or placed on fire rack, turned during cooking. Or, mixed with water to soft dough, pieces about 2" x 1" dropped into boiling water

Table 10 (continued)

Food	Description	Cooking methods
Shellfish*		(see <u>aibika</u>). Mixed with water to firm dough, fried in pan in margarine or dripping. Mixed with water to form batter for canned fish fritters (see canned fish).
<u>Terebralia sulcata</u> (Born)	Dug from mud or chipped off rocks at low tide.	Shells washed free of sand and slime, placed in embers. When cooked shells open easily. Fish washed well, put in cold water and boiled, sometimes with aibika (see <u>aibika</u>). Salt water said to be sometimes used as liquid, but this was not observed.
<u>Pitarina citrina</u> (Lamarck)	Varying shapes and sizes; diam. from about $\frac{1}{2}$ " to 2".	
<u>Anadara suggesta</u> (Iredale)		
<u>Telescopium telescopium</u> (Linne)		
<u>Cafrarium tumidum</u> (Röding)		
<u>Chione caledonica</u> (Bernasdi)		
<u>Spondylus ducalis</u> (Röding)		
<u>Ephippium ephippium</u> (Retz)		
<u>Polinices pyriformis</u> (Recluz)		

* Identified by D. MacMichael, Aust. Museum, Sydney.

Table 10 (continued)

Food	Description	Cooking methods
Shellfish-crabs	Bought, sometimes called mud or mangrove crabs.	Placed alive with bound claws in boiling water, cooked briefly. If cooked with bananas, the latter (unpeeled) are boiled until nearly ready then crabs placed on bananas and cooked briefly.
Coconut <u>Cocos nucifera</u>	Bought or received as gift. Ripe nut normally used.	Dry coconut meat shredded from shell with metal scraper or spoon then several times squeezed by hand, with fresh water added, to extract cream. Cream added to cooking water of various foods. Or, small pieces of the dry hard flesh eaten as snacks by children.
Bananas <u>Musa sapientum</u>	Bought or received as gift. Grown in a few gardens. Commonly short, brownish-yellow skinned cooking bananas.	Peeled, placed in saucepan, covered with cold water, boiled, sometimes with other foods (e.g., sweet potato, fish), with or without coconut cream. When cooked with crabs, bananas not peeled until cooked and removed from pot. Very ripe bananas sometimes eaten raw.
Hard biscuits (Navy biscuits) or Service biscuits	Imported food. Very hard unsweetened cracker biscuit, about 3" x ½", weighing approx. 2 oz (56 g) each.	Eaten without spread.
Fats - Butter Margarine Dripping	Imported foods. Butter and dripping bought, margarine usually in rations.	Butter spread on bread; margarine and dripping used as frying fat.

Table 10 (continued)

Food	Description	Cooking methods
Wallaby	Small bush type. Bought (either whole or in sections) partially cooked by boiling and then singeing over a fire, or by singeing only.	Placed at bottom of pot, other foods placed on top, covered with cold water and boiled.
Tea	Purchased, usually in $\frac{1}{4}$ lb packets. Also in issued rations.	Tea leaves put in boiling water, the brew put back on fire rack, and left to stand as long as there is any tea.
Fish	Bought at market. Many varieties available in many sizes. Fresh, or smoked, the latter caught at least one day previously.	Fish placed on top of other food in cooking pot and steamed - water just covering vegetable foods in pot. Fish normally cut up after cooking unless very big.
Betel nut <u>Areca Catechu L</u> Betel pepper <u>Piper sp.</u>	Social practice, undetermined nutritional significance. All ingredients bought: nut of palm, bark, root, stem or seed pod of certain pepper vines, powdered lime, usually prepared from coral.	Edible portion of nut chewed with lime and pepper. More lime added from time to time. Young children chew sweet outer fibrous pith of betel nut.
Breadfruit <u>Artocarpus incisa</u>	Not cultivated. Common variety.	Unpeeled, baked on grid over fire. Also said to be cut up and boiled, probably when green.
Mango <u>Mangifera indica</u>	Wild species. Several trees at camp. Fruit eaten by anyone who cared to pick it.	Eaten raw.

Table 10 (continued)

Food	Description	Cooking methods
Papaw <u>Carica papaya</u>	Cultivated. Numerous trees around houses and in gardens.	Eaten raw.
Malay apple <u>Eugenia malaccense</u>	Not cultivated. Two trees at camp. Tree may be 20-30 feet high, dark green slender leaf about 6" long, reddish blossom. Fruit about 1½" diam. round, red skin, white flesh, slightly sour taste. Contains single seed.	Eaten raw.
Pandanus <u>Pandanus sp.</u>	Common wild coastal type. Two or three trees near camp. Ripe fruit golden-green, and 'keys' separate easily.	Eaten raw mainly by children. Pandanus 'keys' are sucked, the fibrous residue discarded. Appears to be eaten only if nothing else available.

green leaves and coconut cream. Sago flour was seldom seen at Rabia Camp. On the few occasions that it was available it was made into a cake, a stick or used in soup making. It seems that at Rabia Camp wheat flour, the available product most resembling sago, was used in the same way as sago traditionally.

Food was served from the cooking pot to individual plates, or put in one large or several small bowls on the floor. In the latter case each person served himself by putting food on his plate. Children too young to do this for themselves were served by their mothers. In households with more than one primary family food was usually served by the woman who cooked it.

The only food wastes were vegetable peelings, corn husks, fish bones and the fibre left after making coconut cream. These were usually thrown on to the ground outside the house and were quickly eaten by dogs and chickens.

e. Food preservation and storage

There was no evidence of food preservation by the people of the camp.¹ At Rabia Camp sago was the only indigenous food that was kept for any time. It was either kept in the wrappings in which it had been received, or emptied into a hessian sugar-bag and kept in one corner of the house. Even sago was generally used up quickly since much of it was given away in small lots to other households. The recipient households kept it in an enamel bowl or a metal cooking-pot. Imported foods stored for longer than a day or two were flour and rice (usually in a dry corner of the house in a hessian bag), sugar and tea (in a screw top jar or a tin with a lid though sometimes tea was kept in its original packet). Rice bought in one or two pound weight lots was kept in the original brown paper bags.

Bread and butter (paper-wrapped) rarely lasted more than one day, but any remaining from one meal was usually kept on a shelf in the house. In one household butter was placed in its original wrapper in a basin containing a little water.

Food left over from any meal was put on an enamel plate, often covered with another plate, and kept on a shelf in the house. This leftover food was always eaten on the same day.

¹ There is little food preservation in Papua-New Guinea. Exceptions include Kapuls (Hipsley and Clements 1947) smoked pandanus nuts (Massal and Barrau 1956b). Yams and sago are stored in some areas.

f. Feeding pattern

People normally had two meals a day: a morning meal between 6 a.m. and 8 a.m. and an evening meal between 4 p.m. and 8 p.m., but more usually between 6 p.m. and 7 p.m. The morning meal usually consisted of tea with sugar and either store-bought bread (on rare occasions with butter), flour cakes baked over the fire or fried in dripping, or a hard square biscuit ('navy bread') bought at the trade store. Boiled white rice or fresh foods such as sweet potato and bananas were only occasionally consumed at this meal.

The evening meal consisted of various combinations of boiled white rice with or without canned fish; fresh food such as bananas, sweet potato, cassava with or without fresh fish and coconut cream; and corn and greens such as aibika and pumpkin tips (used in soups). Occasionally bread or flour cakes were eaten also. Despite this apparent variety, boiled rice, with or without tinned fish, was the most often consumed item. Indigenous starchy foods were always eaten with fresh fish and often also with white rice.

Not much food was consumed between these two meals. Some women at home might have a piece of white bread, a flour cake left from the morning meal or some rice, sweet potato, or cassava, but usually nothing was eaten between morning and evening. Tea or water were taken during the day. Working men who did not eat before going to work often came home for a midday meal (usually the leftovers from the household's breakfast) if distance permitted. Other men had no food, but many had water or tea.¹ Meals were not bought at shops and snacks such as meat pies were rarely purchased.

Children, when of an age to help themselves, ate bread, flour cakes, cold cooked rice or other leftover food. When fruits were ripe they could help themselves to mangoes growing at the camp, maita (the Malay apple) or papaw from the family garden. Bread-fruit grew on one or two old trees but it had to be cooked, usually by roasting in embers.

g. Stimulants

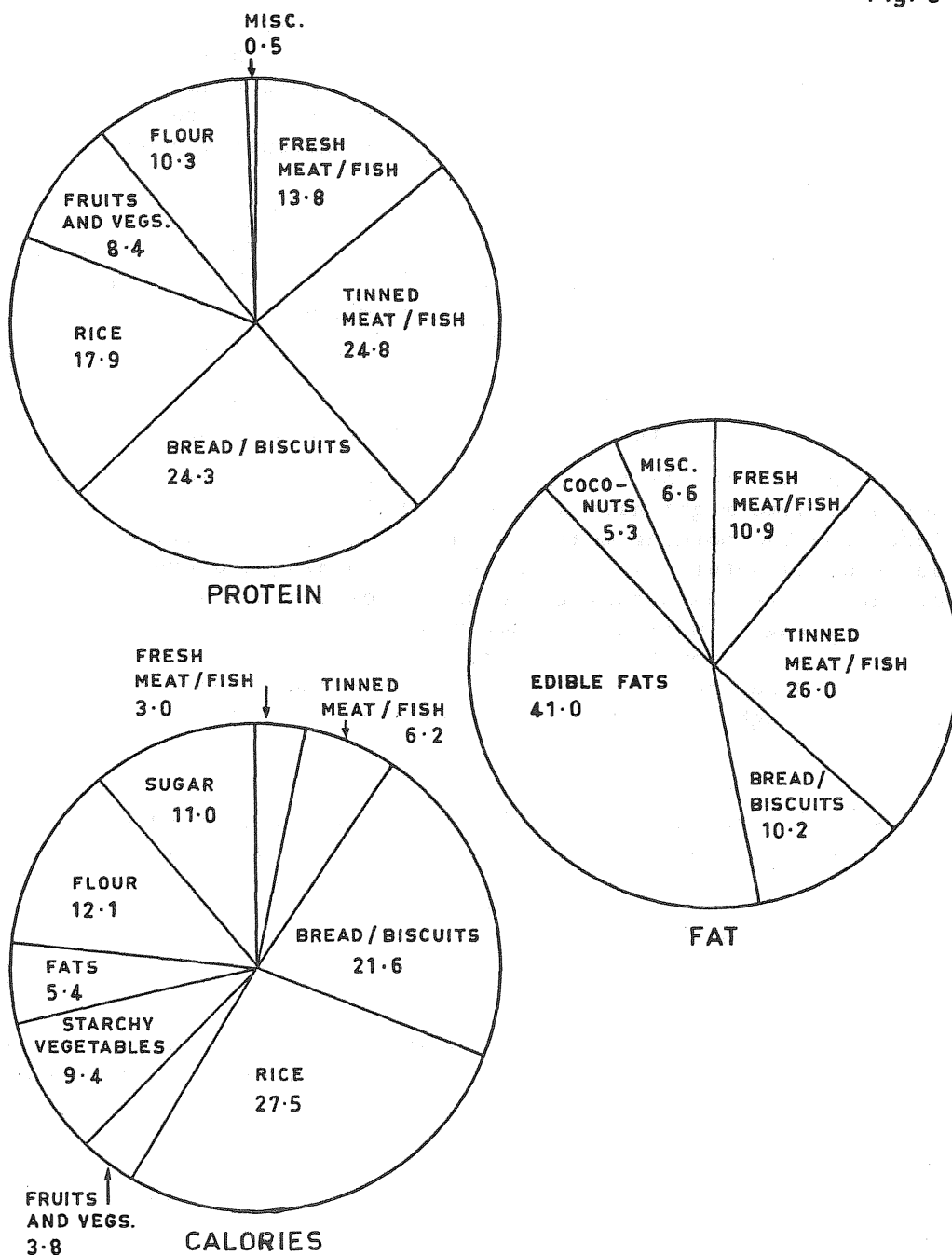
Rabia Camp people normally bought all the ingredients for betel chewing (the Areca nut, the pepper and the lime) at Koki market.²

¹ An exception was a contractor who bought a 2 lb loaf of bread and a 15 oz tin of fish each day for himself and staff of four.

² A description of the effect of betel chewing appears in Hipsley and Kirk 1965 and Sinclair 1957. A historical review of the practice has been made by Krenger 1946.

PERCENTAGE COMPOSITION OF AVERAGE ADULT DIET
RABIA CAMP

Fig. 3



They would consume even more if they could afford it. Young children were often seen chewing the outer fibrous sheath from around the edible Areca nut. It was said to taste sweet. One mother often gave her children pre-chewed betel quid but this practice was not widespread.

Prior to October 1962 Papuans and New Guineans were not legally allowed to consume alcoholic drinks. This was abolished by Ordinance 67 of 1962, and there has been much speculation (but no research) on the effect this has had on quantity and quality of food and other commodities consumed. At the time of our study only a few men and no women at the camp customarily bought alcoholic liquor. Disapproval or dislike of drinking were voiced on several occasions but lack of money was no doubt also a factor as the few houses where alcohol was bought were among the more affluent.

h. The food buying pattern

Of the original ten sample households (part one of the survey) four had no regular source of income. One of these obtained a little cash from selling empty bottles, and usually spent all the available money once or twice a day on food. In the other three households, money was available from gambling, and possibly other extra-legal pursuits, and from gifts. In each case food was bought as needed for each meal. Some money was usually still in hand after the day's purchases had been made.

Of the six households with a regular income from employment, one was paid monthly, three fortnightly and two weekly. The man paid monthly received only a small sum and used most of it to buy bulk flour on or soon after payday. The family then spent little until this food was consumed. Small sums earned by children as golf caddies were spent that day or the next on store food. In two of the three households receiving wages fortnightly enough fresh food for a day or two was bought at the market on payday, and bulk flour and perhaps rice was bought to last the remainder of the fortnight. Occasional supplements came from the garden or by gift or purchase. In the third household food was bought as needed for meals. The two men paid weekly bought larger quantities of food than usual from the market on the evening of payday, but continued to buy food daily.

In part two of the survey four out of six households were without a regular income and bought food for one meal at a time with what money was available from gambling, gifts, bottle sales or other sources. One of the two households with regular income was paid weekly and one fortnightly. Both bought food daily as needed, though larger amounts of local foodstuffs were bought from the market on payday.

It was usual, then, for households to buy food for one day, and often for only one meal, at a time. Those receiving wages made larger purchases on payday. Most store buying was done by women or children and a little by men on the way home from work. Only adults bought food at the market and on paydays women often met their husbands there after work.

j. Food and nutrients consumed

The average quantities of foods consumed by men and women (part one) are shown in Table 11 and of fluids in Table 12. The average consumption of nutrients by men and women (normal, pregnant and lactating) is shown in Tables 13a and 13b and for children in Tables 14a and 14b.¹

(i) Energy (food) intake. The proportions of food energy (calories) contributed by the various groups of foodstuffs to the diets of adults are shown diagrammatically in Figure 3. The percentage of total calories contributed by the various food groups as calculated in part two appears in Table 15, which shows little variation between the two surveys. Imported foods, predominantly carbo-hydrate, such as rice, flour, bread and sugar, contributed over 70 per cent of the total diet calories. Of the remainder approximately one third (i.e., 9.4 per cent of the total) was contributed by starchy vegetables - sweet potatoes, cassava and bananas. Fats, contributing 5.4 per cent of total calories, were composed of approximately equal quantities of butter and dripping. Little margarine was used.

Adults. The mean caloric value of the food consumed daily by men in part one was 1,200, by non-pregnant, non-lactating women 1,035, and by pregnant and lactating women 1,135 and 1,045 respectively. Nine per cent of the average adult calorie intake was from protein and 13 per cent from fat.

¹ An average figure is used since, with a few exceptions, intakes fell within a reasonably small range. The exceptions were those at either end of the range of intakes. Adults with intakes at the lower end of the range were unemployed people who had apparently no close ties with others at the camp. Frequency distributions of intakes support the use of averages. For example, the median interval of a frequency distribution of adult male protein intakes was 25-35 g daily, with a fairly even distribution on either side of this interval. A similar distribution of calories was seen about a median of 1,100-1,300 calories. In adult females, the median interval of a protein frequency distribution was 20-30 g, and of calories 800-1,000 calories. For both distributions there was a slightly greater number of cases below the median than above it.

Table 11

Average weight of food consumed by men and women per head per day
(Grams of edible portion)

	Men	Women
Bread and biscuits	96.7	77.1
Rice* (dry weight)	98.3	81.0
Flour**	41.4	40.9
Sweet potato	3.8	19.8 ^φ
Cassava	29.3	30.4
Bananas	58.0	39.6
Green leaves***	8.7	10.6
Other fruits and vegetables [#]	56.5	57.1
Fresh meat	3.7	3.8
Fresh fish/shellfish	23.0	14.6
Tinned fish	34.7	32.2
Tinned meat	2.6	1.6
Sugar	32.5	25.6
Edible fats [#]	7.1	7.1
Coconut [#]	6.3	4.5

* Mostly white, but some brown.

** White wheat flour, with a little wheatmeal flour and sago.

*** Pumpkin tips and aibika.

[#] Includes pumpkin, corn and mangoes.

[#] Approximately half butter, half dripping - negligible amounts of margarine.

[#] Includes coconut cream and coconut meat.

^φ Higher average consumption of sweet potato by women was due to the relatively large amount eaten by one household containing no men.

In part two food available for consumption has been calculated making allowances for wastage in preparation (e.g., peeling) and non-edible portions (e.g., bones). Plate waste was negligible. Food energy per head per day was calculated as 1,100 calories. The per capita average for part one was 1,000 calories.¹

Children. From the latter part of the first year, when solid foods were introduced to the breast-feeding regimen, the amount of energy contributed by solid foods rose from an average of 116 calories when first introduced to 1,140 calories at 8-10 years of age. From and including the age group 2-4 years calories were from solid foods only. Only two subjects over the age of ten were

¹ This includes all adults and children but not breast fed infants.

available, a girl of 12 and a boy of 14. Energy (food) intakes are shown separately in Table 14a for these and were 1,095 calories for the girl and 1,280 for the boy.

Table 12
Average daily consumption of fluids by men and women
(ml per head)

Type of fluid	Men	Women
Water	153	143
Aerated drinks	-	3
Water (as tea)	521	414
Cooking water	122	134
<u>Coconut water</u>	-	-
Total fluid	796	694
<u>Water in food</u>	428	435
Total water consumed	1,224	1,129
Water of oxidation (approx.)*	180	160
Total water available	1,404	1,289

* Calculated as 150 ml/1,000 calories food oxidised.

(ii) Protein. Adults. The proportion of protein contributed by the various groups of foodstuffs to the adult diet is shown in Figure 3. Bread, biscuits, rice and flour contributed 52.5 per cent of the total, tinned meat and fish (mostly fish) 24.8 per cent and fresh meat and fish (mostly fish) 13.8 per cent. Cassava, pumpkin and banana contributed 8.4 per cent.

Men consumed a daily average of 30.9 g protein, non-pregnant, non-lactating women 23.4 g, and pregnant and lactating women 30.7 g and 24.5 g respectively (Table 13a). The high level of protein in the diets of the two pregnant women was possibly related to the foods chosen on the days recorded as the same foods were consumed by all members of the respective family groups. Protein per head in part two was 25.9 g per day, in part one 27.2 g.

Children. Little protein was obtained from foods other than breast milk (average 2.5 and 7.7 g) in the first and second years. There was little difference in daily protein intakes for the next three categories: 23.0 g at 2-4 years, 28.1 g at 5-7, and 25.2 g at 8-10 years (Table 14a).

The 12 year old girl and 14 year old youth averaged 21.0 g and 32.4 g protein daily. The lower protein level of the girl reflects the dietary pattern of her household, where little fish and meat were eaten, and much sweet potato.

Table 13a
Consumption of nutrients by adults*
(Average per head per day)

Subjects	No. of subject days	Av. height cm	Av. weight kg	Protein g	Fat g	Calories	Water** g	Fibre g
Men	55	163.1	50.2	30.9 (12.2-63.9)	17.1 (1.6-76.2)	1,200 (384-2,491)	428.2 (512.8-2,151.7)	1.7 (0.5-8.1)
Women (non- pregnant, non- lactating)	27	148.3	43.1	23.4 (5.6-63.9)	16.1 (1.06-43.2)	1,035 (414-2,490)	371.5 (488.7-1,828.4)	1.5 (0.0-5.3)
Women (pregnant, 3rd trimestre)	5	157.2	54.4	30.7 (11.73-48.3)	15.5 (5.32-30.11)	1,135 (717-1,657)	597.7 (715.0-1,467.9)	4.2 (0.5-8.6)
Women (lactating)	21	147.3	39.0	24.5 (11.2-60.8)	13.9 (2.3-43.2)	1,045 (595-2,435)	336.4 (588.7-1,764.4)	1.0 (0.5-5.3)

* For minerals and vitamins see Table 13b.

** Water from foodstuffs only. For total fluids see Table 12.

Table 13b
Consumption of minerals and vitamins by adults
 (Average per head per day)

Subjects	Calcium mg	Iron mg	Carotene I.U.	Vitamin A I.U.	Thiamine* mg	Riboflavin mg	Preformed Niacin mg	Vitamin C mg
Men	157 (12.8-689.0)	4.2 (1.9-8.1)	1,830 (0.0-10,528)	83 (0.0-680)	0.577 (0.201-1.552)	0.396 (0.033-3.384)	6.45 (1.798-11.110)	32.2 (3.78-130.1)
Women (non- pregnant (non- lactating)	154 (11.2-689.0)	3.8 (0.78-7.4)	1,950 (0.0-10,528)	74 (0.0-680)	0.501 (0.094-1.500)	0.366 (0.011-3.300)	4.92 (0.672-10.2)	37.7 (6.4 -131.5)
Women (pregnant, 3rd trimestre)	176 (58.1-285.0)	4.5 (1.9-7.6)	250 (0.0-10,752)	0 (0.0)	0.555 (0.258-0.829)	0.446 (0.249-0.887)	6.96 (3.864-10.396)	78.0 (0.0 -130.1)
Women (lactating)	141 (31.2-693.0)	3.7 (1.8-7.4)	2,130 (0.0-10,276)	154 (0.0-672)	0.536 (0.218-1.552)	0.359 (0.054-3.360)	5.66 (2.016-11.104)	20.6 (10.1 -100.4)

* Much of this supplied by white rice, which in Papua and New Guinea is enriched with 300 mg thiamine per 100 g rice.

Table 14a
Consumption of nutrients by infants and children*
(Average per head per day)

Subjects	No. of subject days	Av. height cm	Av. weight kg	Protein g	Fat g	Calories	Water in food*** g	Total water consumed	Drinking fluid g	Fibre g
Infants 9/12-12/12**	12	not measured	7.6	2.5 (0.5-10.4)	0.6 (0.0- 2.8)	116 (78- 508)	41.5	123.5	82.0	0.2 (0.0-1.05)
13/12-18/12**	9	not measured	9.5	7.7 (2.7-10.6)	3.2 (0.8-10.8)	305 (153- 514)	138.7	310.7	172.0	0.8 (0.0-2.7)
2-4 yr	26	100.1	13.3	23.0 (5.7-46.3)	12.4 (2.9-31.5)	890 (382-1,261)	264.5	745.6	481.1	1.1 (0.0-5.9)
5-7 yr	20	114.6	18.8	28.1 (10.5-57.1)	16.1 (1.06-30.8)	905 (327-1,654)	296.6	796.1	499.5	1.2 (0.0-5.2)
8-10 yr	19	124.4	21.7	25.2 (3.1-58.3)	16.3 (2.9-30.5)	1,140 (691-1,812)	352.7	922.7	570.0	0.7 (0.0-3.4)
12 yr female	6	148.6	35.8	21.0 (9.2-45.8)	15.2 (4.7-29.3)	1,095 (687-1,402)	391.6	895.6	504.0	1.3 (0.0-3.2)
14 yr male	3	158.3	48.1	32.4 (21.5-35.2)	15.2 (11.4-17.8)	1,280 (906-1,581)	662.0	1,483.3	821.3	3.9 (1.6-6.6)

* For minerals and vitamins see Table 14b.

** Estimates do not include breast milk.

*** Excludes metabolic water.

Table 14b
Consumption of minerals and vitamins by infants and children
 (Average per head per day)

Subjects	Calcium mg	Iron mg	Carotene I.U.	Vitamin A I.U.	Thiamine mg	Riboflavin mg	Preformed Niacin mg	Vitamin C mg
Infants	32	0.4	360	4	0.063	0.023	0.80	3.9
9/12-12/12*	(5.3- 78.5)	(0.2-1.8)	(0.0-2,560)	(0.0- 60)	(0.014-0.302)	(0.006-0.074)	(0.352- 1.948)	(0.0- 21.0)
13/12-18/12*	75	1.5	1,830	4	0.174	0.106	2.10	14.9
	(6.5-253.0)	(0.4-3.1)	(0.0-5,340)	(0.0- 60)	(0.060-0.357)	(0.011-0.244)	(0.428- 4.656)	(0.0- 26.3)
2-4 yr	125	3.7	1,350	87	0.400	0.170	4.70	16.7
	(11.2-657.0)	(0.8-6.8)	(0.0-8,498)	(0.0-567)	(0.082-0.760)	(0.020-0.459)	(0.706-10.956)	(0.0- 93.4)
5-7 yr	137	3.8	2,050	62	0.419	0.238	5.00	22.2
	(39.7-657.0)	(1.8-8.1)	(0.0-7,560)	(0.0-384)	(0.212-0.749)	(0.061-0.459)	(1.348-10.956)	(0.0- 93.4)
8-10 yr	122	3.8	1,040	92	0.592	0.184	5.66	34.4
	(43.3-299.0)	(1.7-6.5)	(0.0-4,200)	(0.0-384)	(0.217-0.960)	(0.049-0.332)	(1.562- 9.538)	(0.0-197.3)
12 yr	103	3.9	460	0	0.650	0.202	4.48	88.1
	(50.4-211.0)	(1.7-6.2)	(0.0-2,788)	(0.0)	(0.217-0.960)	(0.083-0.331)	(3.28 - 7.816)	(0.0-197.3)
14 yr	225	5.5	3,140	0	0.708	0.501	5.26	37.5
	(177.0-269.0)	(4.2-7.5)	(0.0-5,040)	(0.0)	(0.537-0.846)	(0.215-0.557)	(7.77 -10.68)	(0.0-115.1)

* Estimates do not include breast milk.

Table 15
Percentage of total calories from various foods

Food	Part one	Part two
Tinned meat/fish	6.2	6.3
Fresh meat/fish	3.0	3.8
Flour/sago flour*	12.1	5.5
Rice	27.5	34.3
Sugar	11.0	10.1
Bread/biscuits	21.6	22.1
Starchy vegetables and bananas	9.4	10.5
Other vegetables/fruit	2.7	2.1
Coconuts	1.1	1.5
Fats (butter, margarine, dripping)	5.4	3.6
Miscellaneous (milk, eggs)	-	0.2

* Less flour was used in part two, but this was offset by an increase in the amount of rice consumed.

(iii) Fat. Adults. The greatest single source of fat in adult diets (men 17.1 g; normal women 16.1 g; pregnant women 15.5 g; lactating women 13.9 g daily) was the edible fats (41 per cent) composed almost equally of butter spread on bread and beef dripping used for frying. Tinned fish packaged with added oil and small quantities of tinned meat contributed 26 per cent of total fat, fresh fish and meat 10.9 per cent, fat from coconut (coconut cream used in cooking and coconut flesh) 5.3 per cent. Fat available for consumption in part two was 16.5 g per head daily, as against 14 g in part one.

Children. Fat from sources other than breast milk increased from 0.6 g at the end of the first year to 16.3 g at the age of 8-10 years, and 15.2 g for both the 12 and the 14 year old. Sources of fat were the same as for adults except that the fat consumed by infants of 9-12 months was entirely from butter spread on bread.

(iv) Minerals and vitamins. Calcium. The principal sources of calcium for children from two years of age, and for adults, were tinned fish, flour, bread and rice. Calcium-rich green leaves (pumpkin tips and aibika) were eaten only infrequently and in small quantities. Calcium levels in Tables 13b and 14b (141-76 mg, adult range and 32-137 mg in children) exclude calcium from the breast milk. Appreciable amounts of calcium were obtained from the powdered lime which was added to betel nut and chewed by most men and women, but how much of this was absorbed or was metabolically available is unknown.

Iron. Small quantities of iron were contributed by most foods. In children the level ranged from 0.4 mg towards the end of the first year (excluding breast milk) to 5.5 mg at 14 years. The adult range was 3.7-4.5 mg daily.

Vitamin A activity. Most of the vitamin A activity in diets of all persons was in the form of carotene (360-3,140 international units [i.u.] in children and 250-2,130 i.u. in adults), supplied by pumpkin, a small quantity of leafy greens, banana, a little papaw and mango. Some of the cassava eaten was a yellow-red pigmented variety contributing some carotene. Excluding breast milk, preformed vitamin A was entirely from butter. As mangoes, pumpkin and leafy greens were seasonal, dietary carotene levels varied accordingly.

Other vitamins. Average milligrammes of vitamin per 1,000 calories ranged as under:

	Adults	All children
thiamine	0.480-0.513	0.449-0.593
riboflavin	0.330-0.393	0.200-0.393
preformed niacin (not including any derived from tryptophan)	4.8 -6.1	4.1 -6.9

Mean daily intake of ascorbic acid (vitamin C) ranged from 21 to 78 mg per head for adults and for children from 4 mg in the youngest age group to 88 mg.

(v) Fibre. Crude daily fibre intakes ranged from 0.2 g in infants who had recently begun taking solid foods (9-12 months of age) to 3.9 g in the 14 year old boy. Average adult intakes ranged from 1.0 to 4.2 g with higher individual fibre values due to greater consumption of fruits and vegetables.

(vi) Water. The mean quantities of water from all sources were 1,404 ml for men and 1,289 ml for women (Table 12). Most of this was taken as tea or water both for adults and for children past breast-feeding. Table 14a gives the quantity of water contributed by foodstuffs and drinking fluids to each age group. To determine total fluid intake for age groups greater than two years 150 ml of metabolic water per 1,000 calories of food oxidised should be added.¹ The volume of fluid from breast-milk is not known.²

¹ Calculated from values given by Geigy 1956:538.

² In a coastal village in 1962 breast milk consumed by an infant was estimated to be 490 ml at 8-12 months of age. This quantity would be expected to decrease at late stages of lactation (Hipsley and Kirk 1965).

k. Physical condition, health and general activity

A good indication of physical condition is given by height, weight and skinfold thickness and the ratio between weight and height. Table 16 compares figures for Rabia Camp with those for young men and women at Kikori in the Purari area (Whyte 1958), Pari in the New Guinea Highlands, and Kaparoko on the Papuan coast (Hipsley and Kirk 1965). Table 17 compares heights and weights of Rabia Camp infants and children with data from Hipsley and Clements 1947.

Rabia Camp women were of the same average height as Pari women, but their average weight was 7.2 kg less. Rabia Camp men, of the same average height as the men of Kaparoko, were 9.1 kg less in weight. The weight/height ratios reflected these differences.

While Purari women at Rabia Camp displayed a weight/height ratio little different from that of women in the Purari (0.279 and 0.297), there was a greater difference between men at Rabia (0.310) and those of the rural area (0.343) where men of the same average height were 5.8 kg heavier.

Skinfold thicknesses (measuring body fat) for both men and women at Rabia Camp were less than those of adults in the other two localities for which figures are quoted. Many of the adults in the camp were thin. Some were still receiving outpatient treatment for tuberculosis.

The infants and young children did not appear unduly thin though they were not as well covered as village children in Kaparoko, sixty miles away (Hipsley and Kirk 1965). They appeared quite active in play. Some younger children had scabies, but no medical treatment was sought. Occasional protruberant abdomens were seen, generally in children of two to three years. The few adolescents at the camp were well covered.

Women at the camp were seen to carry out a variety of chores which included: collecting water in buckets from tanks in Kaugere (sometimes helped by a child or relieved by a male of the household); washing clothes in a large basin; sweeping the house and grounds; preparing and cooking food; gardening; gathering shellfish; gathering wood; walking two miles to or from the market or shorter distances to the trade stores.

Many of these chores were done infrequently and there was much free time during the day. The morning meal usually required only cutting bread, making tea, and washing a few dishes. Washing clothes and sweeping were done every second or third day. All chores could be finished in no more than an hour and a half of continuous effort. Only if indigenous foods were to be used was much time devoted to preparing meals. In households with more than one primary family some chores, such as carrying water and

Table 16
Height, weight, skinfold thicknesses in adults

Location	No. observed	Average height		Average weight		Ratio*	Skinfold thickness subscapular mm. (Av. of 5 readings each subject)
		inches	cm	lb	kg	W/H	
<u>Women (18-45 years)</u>							
Rabia Camp	14	58.2	147.8	91.0	41.3	0.279	9.3
Pari	19	58.2	147.2	106.6	48.5	0.330	12.67
Kaparoko	31	60.9	154.7	113.4	51.5	0.333	17.00
Kikori			154.0		45.8	0.297	
<u>Men (18-45 years)</u>							
Rabia Camp	18	64.2	163.1	110.8	50.2	0.310	8.3
Pari	33	62.0	157.5	124.5	56.6	0.358	9.5
Kaparoko	31	64.2	163.1	130.4	59.3	0.364	10.45
Kikori			163.0		56.0	0.343	

* W = weight in kg; H = height in cm. White (1958) quotes W/H ratios for young white Australian men as 0.413, while Bailey (1962) found W/H ratios in a hunger area of Java to be 0.276 for women and 0.292 for men.

Table 17
Heights and weights in infants and children

Age	Less than 1 year	1-2 yr	2-4 yr	5-7 yr	8-10 yr	12 yr	14 yr
<u>Height (cm)</u>							
Rabia Camp 1963	not available		100.1	114.6	124.4	148.6*	158.3**
1947 survey***			96.3	106.3	124.4	131.7	138.7
<u>Weight (kg)</u>							
Rabia Camp 1963	7.6	9.5	13.3	18.8	21.7	35.8	48.1
1947 survey	6.1	8.1	12.7	17.7	23.6	30.2	36.4
<u>Ratio W/H</u>							
Rabia Camp 1963			0.133	0.164	0.174	0.241	0.304
1947 survey			0.132	0.166	0.166	0.229	0.263

* Female one subject

** Male one subject

*** Figures quoted for 1947 are for males, but there was little difference between values for males and females.

sweeping were shared. Children often did the shopping at local trade stores. Firewood was gathered about once a week; and after gardens were prepared and planted they required only a little weeding. The remaining time was spent in talking, playing cards, sleeping and other pursuits.

No woman at the settlement was too old to do most household tasks. The men considered too old to work for wages stayed at the camp doing odd jobs or a little gardening, but little else.

Unemployed men of working age, when not seeking employment, spent their time talking, playing cards, sleeping and visiting friends in various parts of Port Moresby. Occasionally some helped with fetching water, but none did garden work during the survey. Employed men normally worked five days a week. Weekends were for relaxation. Several groups of men, and occasionally some women, played cards from as early as 9 a.m. On Sundays some people walked to church at Koki or to the market or went visiting. Visitors often came to the camp on Sundays.

After school the children played games with a ball or marbles and at weekends played games or watched the adults gamble. Some older children left the camp with friends, and parents often did not know where they went, what they did, or when to expect them home.

Times of rising and retiring varied. Working men rose about 6 a.m. or earlier. Unemployed men often remained asleep until 9 a.m. or later. Women usually rose early enough to prepare breakfast before husbands or children left for work or school but it was not uncommon for them to sleep again later in the morning.

Informants stated that after dark people either visited other houses to talk or stayed at home. There was little attendance at evening entertainments such as the cinema or church functions.

Arts and crafts were rarely pursued. During the survey handicrafts were seen in only two houses. In one a woman who had learnt in hospital was knitting and in the other a man was mat-making with material he had brought from Purari and his wife was knitting a child's garment. She had learnt knitting from a mission. Sleeping mats were either bought in town or sent as gifts from the home village. Most string bags had been obtained by gift. Two women in the sample had sewing machines which they used for making clothing and for mending.

1. Income and expenditure

In part one of the survey ten households provided budgetary data for one week. In part two, six of these provided data for different periods of time (one for a week, one for eleven days, one for two weeks and three for four weeks). The data obtained in part two have been reduced to an average for one week.

In order to compare parts one and two, only those six households which participated in both have been included in calculations of income and expenditure. One of these received more income than the other five put together, so it has been treated separately and referred to as household B. The average family of the five households comprised 2.2 adults and 2.4 children. Household B included two children and two adults.

All calculations of income and expenditure refer only to the primary family of the head of the household and not to all persons in the dwelling. In a household with more than one primary family but with one hearth (i.e., all occupants cooked and ate together) food was bought either by the householder's wife or by one of the other residents, to be cooked and distributed to all. At times residents who were not part of the householder's family formed a separate hearth to prepare food obtained by purchase, rations or gifts which were shared only within that sub-group and not by all members of the household. In recording income and expenditure, contributions by these persons to the head of the household or his family have been regarded as gifts to him. Similarly food distributed by the head of the household and his family has been regarded as a gift from him.¹

(i) Income. For many camp residents employment was spasmodic. Income earned from employment was recorded only if a payday occurred in the budget period. Householders claimed to earn from wages \$5 per month to \$92 per week, the latter by a contractor who paid out \$50 of it in wages to employees.

'Sundaying' and 'companying' were not practised in the sample though a guest in a household not included in the sample belonged to such a group.²

Miscellaneous income was earned from the collection and sale of empty bottles, the sale of chickens, payment for sewing clothing for an unmarried man and the sale of tomatoes to Europeans.

In part two householder B bought beer, rum and aerated cordials which he sold by the glass at nearly 100 per cent profit to persons attending an evening party at the camp.

¹ Records of income and expenditure were usually obtained from both the householder and his wife. If he was away working, he gave his wife the information to pass to us.

² 'Sundaying' involves all members of a group giving a fixed sum, usually weekly, to each member in turn. 'Companying' occurs when the member of a 'Sundaying' group whose turn it is to be paid, negotiates with a member of another 'Sundaying' group, thereby accumulating a much larger sum.

Table 18
Income and expenditure of Rabia Camp sample households for one week

Income									Expenditure								
Item	Part 1		Part 2		Part 1		Part 2		Item	Part 1		Part 2		Part 1		Part 2	
	5 households		5 households		household B		household B			5 households		5 households		household B		household B	
	\$	% of	\$	% of	\$	% of	\$	% of		\$	% of	\$	% of	\$	% of	\$	% of
	Amount	total	Amount	total	Amount	total	Amount	total		Amount	total	Amount	total	Amount	total	Amount	total
<u>Cash</u>									<u>Cash</u>								
Earnings	8.00	16.8	10.25	16.0	22.00	52.3	42.00	71.4	Indigenous food	3.97	8.2	2.87	4.4	7.40	17.6	7.80	13.3
Miscellaneous	7.87	16.5	1.53	2.4	2.00	4.7	8.97	15.3	Imported food	16.28	34.0	10.61	16.5	6.52	15.6	5.72	9.7
Gambling	13.65	28.4	9.79	15.2	12.00	28.5	1.65	2.8	Clothing	-	-	2.18	3.4	-	-	1.20	2.0
Gifts in cash	10.90	22.9	15.21	23.6	5.00	11.9	-	-	Gifts in cash	-	-	0.20	0.3	1.00	2.3	-	-
									Household items	0.42	0.8	1.94	3.0	-	-	1.15	1.9
									Transport	0.15	0.4	0.88	1.4	0.40	0.9	1.43	2.4
									Gambling losses	7.50	15.8	7.38	11.5	1.50	3.6	-	-
									Miscellaneous	6.00	12.6	2.43	3.8	-	-	4.40	7.5
									Betel	-	-	0.61	0.9	-	-	0.60	1.1
									Tobacco/cigarettes	-	-	1.91	3.0	-	-	2.30	3.9
									Beverages	-	-	0.09	0.2	-	-	5.60	9.5
									Savings*	6.10	12.8	5.68	8.8	24.18	57.4	22.42	38.2
Cash income	40.42	84.6	36.78	57.2	41.00	97.4	52.62	89.5	Cash expenditure	40.42	84.6	36.78	57.2	41.00	97.4	52.62	89.5
Average cash/ household	8.08		7.36						Average cash/ household	8.08		7.36					
<u>Kind</u>									<u>Kind</u>								
Gifts	6.23	13.0	23.91	37.3	-	-	3.37	5.7	Gifts	1.41	3.0	8.84	13.8	-	-	1.65	2.8
Garden produce	1.10	2.4	3.61	5.5	1.10	2.6	2.81	4.8	Goods consumed**	5.92	12.4	18.68	29.0	1.10	2.6	4.53	7.7
Kind income	7.33	15.4	27.52	42.8	1.10	2.6	6.18	10.5	Kind expenditure	7.33	15.4	27.52	42.8	1.10	2.6	6.18	10.5
Total income	47.75	100	64.30	100	42.00	100	58.80	100	Total expenditure	47.75	100	64.30	100	42.10	100	58.80	100
Total average/ household	9.55		12.86						Total average/ household	9.55		12.86					

* Taken as the difference between cash income and cash expenditure. It is not a recorded amount.

** Taken as the difference between cash value of total income in kind, and cash value of expenditure on gifts in kind. It also is not a recorded amount.

In part one, two unemployed householders depended on the profits of gambling (and possibly other pursuits) for cash income. One was still partly dependent on gambling in part two, but he had received the gift of a substantial sum of money. He was also obliged by police action to look for employment.

Cash gifts were occasionally made to the head of a household by others in his house and by friends or relatives in other houses at the camp or elsewhere in Port Moresby. A gift of \$4 to help pay a fine was offset by the recipient having paid the donor's (her brother's) fare from the Purari two years before. The rationale for other gifts was not revealed.

Most gifts in kind were small quantities of cooked food for which a reciprocal gift was given within a day or two, and were most numerous where more than one family lived in a dwelling. In part one, for example, one household received gifts ranging in value from \$0.02 to \$0.65. Visitors staying overnight or coming for meals usually contributed food (most of it fresh). Some gifts of cooked food were received in acknowledgment of assistance given at funerals, the value of one such gift being \$0.55. The only non-food gifts in kind were a quantity of betel nut and a stick of tobacco. Gifts of clothing and net bags had been made but not during the survey periods.

Little garden produce was used, though more in part two than in part one. In part one it was mostly cassava, in part two mostly bananas, as well as papaw and mangoes which were in season.

At neither time was money withdrawn from savings bank accounts. Firewood was gathered and some building material given by a European employer but the cash value of these was not assessed.

(ii) Expenditure. Food was the greatest single item of expenditure in every household in both periods. Every household except household B spent more money on imported than indigenous foods. Clothing bought comprised inexpensive underclothing, dress material and ready-made garments for children and adults. The most common household items were soap and kerosene. The few gifts of cash by heads of households were to relatives in other households.

Little was spent on transport to work. People walked either to work or to a point at which the employer's transport picked them up. Most transport expenses were bus and taxi fares from the market and from Port Moresby town, usually after shopping, and bus transport from church. Only one person lost more at gambling than he won during the survey. The miscellaneous category included contributions to churches and schools, subscription to clubs, money banked, entertainment, children's spending money and court fines. No payment was made as rent or for public utilities. A child's savings bank deposit and a court fine of \$6 were the only recorded items in this category in part one. The main items in

Table 19

Cash value of food consumed by six sample households
(Parts one and two compared)

Item	Households					Household
	1	2	3	4	5	B
Part one						
1 Imported food	\$3.27	\$4.91	\$4.14	\$2.50	\$1.35	\$6.51
2 Indigenous food	0.30	-	2.50	1.17	-	7.40
3 Garden produce	0.35	0.60	0.05	-	0.10	1.10
4 Food gifts*	2.60	1.10	1.63	0.35	0.55	-
5 Gifts made from purchases	0.23	-	2.26	-	0.60	9.80
6 Gifts made from gift or garden food**	0.30	1.00	-	0.11	-	-
Food consumed by family unit	5.99	5.61	6.06	3.91	1.40 (2.22)#	5.21
Part two						
1 Imported food	\$4.84	\$2.31	\$2.61	\$0.38	\$0.47	\$5.71
2 Indigenous food	0.32	0.75	0.62	1.17	-	7.80
3 Garden produce	0.90	0.39	0.78	0.88	0.67	2.81
4 Food gifts*	1.12	7.88	2.47	11.22	1.23	3.38
5 Gifts made from purchases	1.40	1.61	0.74	0.12	0.04	9.95
6 Gifts made from gift or garden food**	0.55	5.29	0.78	1.66	0.57	1.65
Food consumed by family unit	5.23	4.43	4.96	11.88	1.76	8.10 (6.10)##

Note. Costs of food consumed by households calculated by addition of items 1-4, subtraction of items 5 and 6.

* All cooked food gifts were consumed, but some raw (e.g., sago) was stored. The greater value of food consumed by household 4 in part two came mainly from a welfare agency.

** i.e., food distributed from items 3 and 4.

[#] Figure corrected to take account of bulk stocks of food purchased the week before the survey.

^{##} Figure corrected to take account of approx. \$2 worth of gift of sago received during the survey week, but which remained uneaten at the end of the week.

part two were a church contribution, money banked and a court fine of \$1.

Stimulants included tobacco and cigarettes, beverages and betel nut. In part one no expenditure on these items was recorded, though it was later discovered that two men in the sample did at times buy liquor and most adults chewed betel nut. More familiarity during part two revealed that betel was bought in all but one of the six households, beer in two, a small quantity of cordials in two and tobacco or cigarettes by three. One household bought no stimulants on religious grounds, another had little money to spare for such purchases and one household received a stick-tobacco issue in the rations provided by a welfare agency. This was the only instance of welfare relief during the survey.

Savings were estimated as the difference between cash income and cash expenditure on all the mentioned budget items and was not a recorded amount.

Gifts in kind consisted only of food given to other households, other hearths in the same household, and visitors who came for occasional meals.

The category 'Goods consumed' was an estimate taken as the difference in cash value between gifts received and gifts given.

Wages were not the most important source of income in either part of the study. In part one gambling winnings and gifts of cash were most important; diverse sources provided almost as much cash as wages. Gifts were the most important source of cash in part two. Cash received as a gift was always greater than cash given away as a gift, mainly because the gifts received came from sources outside Rabia Camp.

(iii) Discussion. The greater value of 'kind' income of the five households in Table 18 markedly affected the total average income per household and also the percentage of the total that was represented by cash income. Although there was little difference in cash income, the percentage of total income consisting of cash was 84.6 per cent in part one and 57.2 per cent in part two.

The greatest single cash expense was food. In part one this was 50 per cent of total cash income and in part two 37 per cent. More cash was used in buying imported food (80 per cent) than indigenous fresh foods (20 per cent).

Household B differed from the other households in many ways. The householder had a regular sizeable income. Few gifts were received and little garden produce used, cash constituting over 90 per cent of total income. Most gifts in kind from the householder consisted of cooked food given to visitors staying in the house. More cash was spent on indigenous fresh foods by this household than by the other five households together. More cash

was spent on indigenous foods (55 per cent) than on imported foods (45 per cent). A smaller proportion of total cash was used to purchase food than was used by the other households, although the amount spent was greater. Food purchases accounted for 34 per cent of total cash expenditure in part one and 26 per cent in part two. Savings, taken as the difference between recorded cash income and recorded cash expenditure was considerably larger than in the other five households.

The cash value of food consumed¹ by the six households providing comparative data in the two surveys appears in Table 19. The average total value of food consumed by each of the six households in part one was \$4.83, and in part two \$5.72. If household B is excluded, the average total values for the five households were \$4.76 and \$5.65 respectively for the two parts.

(iv) The unmeasured components of the budget. Numerous possessions and sources of possible income and expenditure have not been assigned a cash value. Housing, utensils and equipment were not considered, nor were livestock, though most households possessed chickens or dogs and in some cases both. Three of the six household heads in the budgetary survey had savings bank accounts, one of which contained \$40. The balances in the others are not known. Two household heads had no bank accounts or savings and one 'banked' spare cash in a locked box in his house. One child in each of three households banked small amounts of money at school.

Some employed persons staying in another person's house made no contributions during the budget periods but had done so at other times. The food given to them has been assigned a cash value and forms part of the expenditure of the household.

Some visitors from the villages sent or brought gifts of sago, breadfruit, mats, bananas or crayfish. Camp residents rarely sent gifts to relatives in home villages, though they accommodated them on their visits to town. The few gifts that were sent to the villages comprised clothing, rice, flour, sugar and occasionally, money.

Houses are built using reciprocal help for which no cash was paid but a midday meal was provided for the helpers. There was no house building during the survey.

A money donation had at one time been made yearly by each householder to the church at Kila Kila ('May monies'), but this had been discontinued since about 1962. Some people used to contribute to a welfare association, but this was no longer active. No regular church contributions were paid and people only attended when they could afford to put a small amount in the collection.

¹ For quantity of food consumed see Tables 11 and 12.

At irregular intervals some families gave money to schools. During the year preceding the survey two payments - one of \$2 and one of \$6 - had been made and another household had given \$3.40 the previous year. No person in the sample households paid any club fees or attended any club. No money was spent on public entertainments by the six households studied during the survey, and at other times it seems that even the cinema is only occasionally visited.

According to Williams (1924) 'lawful' adultery of a wife (i.e., with a husband's knowledge) and wife exchange were practised by rural Purari people. Clandestine adultery was not approved. Informants at the camp claimed that the practice of wife prostitution was no longer approved but at least two households practised it. It was not possible to assess the extent of this, the income derived from it, or expenditure by men for such purposes.

Amounts owed or due from marriage exchanges or other transactions were not assessed. No such transactions took place during the survey. Informants stated that people at the camp used only money in bride-price transactions, while in the Purari area traditional valuables were used as well as money. The head of one household had paid a bride-price of \$394 which he accumulated from several years savings and a gift from a widowed male relative at Rabia Camp. This sum had not been repaid in the three years since the marriage, but would be (partly by borrowing) if the relative wished to remarry. A younger man in the same house, and not long married, said that six single Purari men living in Port Moresby had helped him to gather his bride-price. One young man had paid \$74 for his bride, all from his own savings. Two other households mentioned being under obligations for assistance with bride-price, and one woman married recently without bride-price.

Repayment for assistance at funerals was in the form of a gift of cooked food and has been included in calculations.

Chapter 10

Discussion and conclusions

a. Migration and employment

A series of population counts made between May 1963 and February 1966 show that the camp is a rapidly growing migrant settlement. From 1959 to 1964 this growth was in numbers of people rather than dwellings, whereas between 1964 and 1966, although numbers of residents continued to increase, the number of new houses occupied by Purari people increased by over 50 per cent. Taking into account the small areas of most of the houses (see Oram, p.27) and the number of residents (in 1966 the range was from three to thirty people with a mean of 12.9 per house) one might suppose that they have reached the limit of accommodation, except for the small amount of space at present available in the recently built houses.

Some of the houses built between 1964 and 1966 have taken over former garden land, and any future expansion must continue to do so, as there is no alternative building land available.

The Purari people of the camp in some respects form an extension of Purari society in the Delta. Within the camp people are bound by kinship, village and tribal ties. The camp can also be regarded in a sense as a 'staging camp' since, apart from a 'core' of residents of long standing, there is a large mobile population which uses it for temporary accommodation only before settling more permanently in Port Moresby or other towns. An important function of the camp is the provision of accommodation to large numbers of such people, especially those who have lost employment and accommodation, as well as those on visits from the Purari. It is quite likely that the camp does provide migrants from the Purari with a sense of security because of the persistence there of the ties of traditional kinship systems, etc., thus facilitating their adaptation to the urban environment.

The current trends in migration and population increase at the camp seem likely to continue. Part of the increase between 1964 and 1966 (29 per cent) was the result of twenty-two children born at the camp, but most of the increase was due to the excess of arrivals over departures, particularly of young family groups.

Arrivals included some young unmarried men but few single girls of marriageable age either lived at the camp or arrived from Purari.¹

The 'core' of permanent residents in 1963-4 comprised many who had come to the camp when or soon after it was founded. Many of them are now elderly, and some died between 1964 and 1966. The trend towards a younger population is likely to continue.

There appear to be three main reasons why people leave Purari villages to come to Port Moresby and the camp: to visit, to sell sago and to obtain money from paid employment. Many of the people who came to the camp for any of these reasons did not stay, but many, who claimed to have ample garden land in the Purari did not go back though they had no adequate means of support in Port Moresby.

The camp, founded by Tommy Kabu in 1946 as an urban centre for sago trading, has grown considerably in size despite numerous changes of position and has changed greatly in composition since that time. It is no longer composed mainly of men, but of young families with many young children. Its size now merits further recognition by town authorities, if only in the provision of such essential services as water supply and garbage disposal. Even the older residents who have for so long lived under the same conditions seek improvement for themselves and their younger kin.

b. Dietary levels

(i) Adults. The energy value (calories) of food consumed by this group is the lowest yet recorded in Papua and New Guinea. This may be no more than a reflection of a small body stature and a low level of activity. Such a low energy value could also reflect dietary abnormality in which case hunger, low levels of energy stores (revealed as excessive thinness) and lethargy might be expected.

At the camp both factors are present. The majority had a small body stature, with little appearance of fat storage, especially in older adults. Both men and women weighed less (9.1 kg and 7.2 kg respectively) than those of the same height in two areas where there were no food shortages and people were presumably eating as much as they wanted (see Hipsley and Kirk 1965).

It was suggested that the thin appearance of the people of the Purari area in 1947 was related to the upheaval resulting from the

¹ Young men observed at Rabia Camp marrying for the first time married women from Purari. Older men marrying for the second or more times were as likely to marry Central District women.

cult then sweeping the area and probably causing food shortages (Hipsley and Clements 1947). The most recent comparable village data (Whyte 1958) indicate that while the weight/height ratios of Purari women in both rural and urban environments were little different, those for rural men were greater than for their camp counterparts. Unfortunately there are no recent data on calorie intakes of rural Purari people with which some comparison can be drawn. Nor are there any detailed time-activity accounts from which to assess, even approximately, the energy expenditure.¹

No observations were made of working men, most of whom were labourers. The level of activity in women and unemployed men at the camp was low (see pp.93-6). This could hardly be described as lethargy resulting from abnormally low dietary energy value. Little needed to be done because of economic poverty and the lack of outlets for creative activity because of their cultural isolation.

Energy expenditure was less for women in the urban than in the village situation; gardening in the urban environment did not require much time or energy; there was no walk to gardens and no large loads of produce to be carried home. In addition the foods used required less preparation. The two most prolonged tasks observed were washing clothes and collecting firewood (though washing was done infrequently and firewood was sometimes collected by the men).

It is estimated that because of the less active life of the camp the energy expenditure required is 200-300 calories less than that required by the village dweller.²

As no observations were made of the work of men either in Port Moresby or Purari the relative energy needs in the urban and rural setting are not discussed.

In the urban environment the roles of men and women as contributors of food have been reversed. Although in the rural area men cut sago trees and did some vegetable growing and fishing, it was the women who by their sago-making and river-fishing were the primary contributors of food (Maher 1961). At the camp men were the primary contributors of subsistence needs through cash-earning employment (or gambling, etc.).

¹ The indications are that although women expended less energy in working at Rabia Camp than in the Purari and therefore could be expected (assuming food supply to be the same) to be heavier, they were lighter, presumably as a result of their eating less food. Men employed in Port Moresby were, as might be expected, lighter than workers in the rural subsistence village.

² Using figures calculated for Kaparoko (Hipsley and Kirk 1965).

Neither adults nor children showed any feelings of hunger despite these low calorie intakes.¹ Even the household which had a substantial regular income did not purchase food in any greater quantity than the other households. The intake of food was very uniform for all households. This uniformity indicated that as incomes rise people value additional household goods rather than additional food.²

The average level of food energy consumed was 1,000-1,100 calories per head. Food intake was measured twice, once in terms of food consumed and secondly in terms of food available for consumption. The average quality of food varied little and the variations that did occur seem to have been due to gifts.

Day to day fluctuations in volume of food were small except in two households where there was neither money nor gift. Some of the day to day variation was due to buying and consuming a fixed quantity of food whether there were more or fewer than usual to share it. This was largely due to the sale of foodstuffs in packages of a specified weight. Gifts also produced variations. Seasonal foods appeared to have little effect on level of food energy intake, but did affect the quality of the diet, specifically in terms of vitamins A and C.

Levels of protein in the camp dietaries were comparable to levels found in other areas of Papua and New Guinea. However, whereas rural protein intakes are largely of vegetable origin, with a small but important contribution from fish where available, at the camp over 50 per cent of the protein was from cereals (wheat flour, bread, biscuits and rice) and 38 per cent from tinned fish and meat. Protein contributed 9 per cent of food calories; this is a slightly higher percentage than in rural diets and is comparable to that found in many western communities (10 to 15 per cent).

¹ In experimental starvation studies, Keys et al (1950:829) have reported that 'in total starvation the sensation of hunger disappears in a matter of days. In semi-starvation there was no diminution of hunger'. In the present Rabia Camp context, the indications are that people were consuming as much as they needed to satisfy appetite, and so presumably maintain present body weights.

² The per capita consumption of food in the most affluent household at Rabia Camp was no greater than in other households, but its cost was higher because more traditional (and more costly) food was bought. Expenditure there was greater on stimulants and the household possessed more material goods (chairs, bedding, utensils, etc.).

Low levels of vitamin A and of its precursor β -carotene were noted, but there was no evidence of the most obvious and serious abnormality that can result from insufficient vitamin A or its precursor: dryness of the corneas of the eyes of children (xerophthalmia) leading to ulceration and blindness. Amounts of the vitamin stored from seasonal or periodic larger intakes could suffice to prevent this condition. Mangoes, with two crops a year, were the most important seasonal source at the camp; papaw was a spasmodic and not a seasonal source.

In dietary patterns lacking dairy products, leafy green vegetables are frequently very important sources of vitamin A precursors and of iron, folic acid, riboflavin, calcium and to a lesser extent protein. When such diets have low vitamin A (and β -carotene) levels they are also likely to have low levels of iron, folic acid and riboflavin.

Riboflavin levels at Rabia Camp were low. Clinical evidence of riboflavin deficiency is difficult to detect, but deficiencies of iron and folic acid are often manifested as anaemias during pregnancy. Megaloblastic anaemia of pregnancy (due to folic acid deficiency) and iron-deficiency anaemia both in pregnant women and in men plantation workers are commonly seen at the Port Moresby General Hospital (Ryan and Cook 1963). As the camp people have low dietary iron levels (and probably low folic acid levels) one would expect to find these anaemias in camp residents.

Levels of preformed niacin and of thiamine appeared to be adequate in relation to the total amounts of food eaten.

Fluid intakes among women and unemployed men at the camp seemed small:¹ mean values of 1,405 ml for adult men and 1,290 ml for women. Both values were lower than those recorded at coastal Kaparoko: 1,660 ml for men and 1,400 ml for women (Hipsley and Kirk 1965). Similar climatic conditions prevail in the two localities, but the usual activity level was higher in Kaparoko than it was for women and unemployed men at Rabia Camp. These figures are considerably below the quoted clinical norm of 2,500 ml (Geigy 1956), based on resting conditions and a more temperate climate than that of Port Moresby or Kaparoko.

Water and salt intake and excretion, and the factors that may be involved in the efficient utilisation of water in a hot climate, are discussed by Hipsley and Kirk (1965:Appendix 3). They observed that in a low-sodium and low-protein diet comparatively small amounts of water need to be excreted as urine. Sweat losses during work in Papuans and New Guineans observed were less profuse than

¹ Fluid intakes still appear small even though there may have been underestimation of fluids consumed by working men.

in Europeans exposed to similar heat loads. The evidence of total water available from food and metabolism supported the argument that water needs might be comparatively small. It also pointed to a dietary factor, namely the water-holding hemicelluloses of a high-fibre diet, as being of considerable importance in holding water in storage in the gut, so providing stored water for use when needed and therefore allowing a more conservative use of water.

Observation of the Rabia Camp group suggests that there must be other factors operating as well as, or instead of, those suggested by Hipsley and Kirk 1965. While dietary sodium levels are lower in the Rabia Camp group than in Europeans, they are higher than in village groups where different types of foods are eaten. No data were collected of urine volumes, but sweating was not profuse in any of the subjects (most of whom were women) observed closely in everyday tasks. Level of dietary fibre in the camp group was low by village standards and, varying between 1.0 to 4.2 g daily, was comparable with fibre levels observed in the usual mixed diets of Australians (Hitchcock and English 1963) and in a group of Papuan men students in Port Moresby (Hitchcock 1963). In the latter group total water was 1,960 ml (1,600 ml from food water and drinking fluids and 360 ml metabolic water) and food calories 2,400 daily per head.¹ These young men led fairly inactive lives with episodes of sporting activity, but wore more clothing than the camp or village people.

(ii) Children. In a study of nutritional adequacy by Oomen and Malcolm (1958) it was considered that two areas of New Guinea - Ajamaroe (Kambuja) and Sepik (Tambanum) were nutritionally healthy. The camp children up to about ten years of age compare favourably in respect of both weight and calorie intakes.²

There is little need for separate comment on intake of any nutrients by children. Protein contributed 8-12 per cent of the food calories after the age of two years (i.e., in those groups whose food did not include breast milk) and fat provided 10-14 per cent. Water and fibre intakes were not high.

¹ Their diet included tinned and fresh meat, rice and bread with the addition of margarine, jam, fruit and vegetables (mostly sweet potatoes and Chinese cabbage), some confectionery and snacks such as hamburgers.

² Average weights at 12 mth for the two New Guinea areas and Rabia Camp were 7.2, 8.5 and 7.6 kg respectively, at 2 yr 9.3, 9.5 and 9.5 kg with calorie intake of 610, 710 and 305 (but the last were only in the first half of their second yr); at age four weight for one New Guinea areas was 14 kg (and 900 calories) and for Rabia Camp 13.3 kg (and 890 calories).

The amount of calcium consumed by children over two years was small. A significant adult source - betel nut with lime - was not chewed by children. In the absence of either radiological data or clinical cases of rickets among the children it was assumed that the calcium consumed, combined with vitamin D obtained from the exposure of skin to sunlight, was sufficient. It is possible that more efficient utilisation of calcium occurs when dietary calcium levels are low.

c. Budgets

(i) Food. In the camp more money was spent on food than on any other single item. Food can be classified as acquired by purchase, home gardening and gift.

Although a wide range of imported foods is available, that bought by the camp people was limited almost entirely to rice and tinned fish. Cost and caloric value for the money spent were important considerations, but ignorance of other foods and the ways of cooking them, and the educational experience of rations issued to contract and other labour in the past also influenced their choice.

Any increases in expenditure on items other than food such as could result from a rehousing policy would decrease the proportion of income available for food purchase.

Neither rents nor rates are paid by the camp people. Expenditure on house construction and repair is also insignificant.¹ Little is available for fuel, lighting, clothing and fares.

Higher income is not necessarily reflected in an improvement in the quality of diet. Evidence from other developing countries suggests that increased income earned by the urban poor results in the consumption of a greater quantity rather than an improved quality of food (Burgess and Dean 1962). Walker (1962), however, states that such a rise among the urban Bantu in Johannesburg resulted in greater expenditure on expensive clothing, cigarettes, transistor radios, etc., and on larger amounts of foods such as white bread, sugar, soft drinks and on liquor.

During the follow-up survey in 1966 there were more men in regular employment at the camp than in 1963-4, and there was more money available. In two cases observed the appearances of the individuals indicated a greater total consumption of food than in the earlier period. In the majority of households, however, knowledge of food preferences suggests that if additional money was

¹ Informants maintained both in 1963-4 and 1966 that building materials were never bought but were acquired from building sites when not needed there.

spent on food, it would in the first place be on better quality food and the more highly esteemed traditional foods rather than on a significantly greater quantity of food per person.

Unemployment and a very low income resulted in a food shortage in only two households. Other households with a similar employment situation maintained the general level of intake because of gifts of food or money.

Home produced foods were not important in terms of cash value or caloric content at the times of the survey. At certain other times of the year, in particular as tubers matured, the value of this garden produce in both cash and caloric terms could be much greater. This produce contributed important amounts of protective nutrients such as vitamin A precursor, riboflavin, iron and vitamin C.

Gardens could not be depended on to supplement for loss of employment or lack of money. On three occasions during the two survey periods garden foods would have been of great advantage. In one case some immature sweet potatoes were used; in another, there was no produce ready to eat; and in the third, a woman sold a few tomatoes and bought rice and tinned fish.

Food gifts and exchanges were quite frequent, though usually small - often no more than two or three spoonful and of the same type as that being used by the recipient. Small food gifts of this type were as important as garden produced foods in providing variety and additional vitamins and minerals.

Gifts brought by visitors who shared a meal were always more than adequate to cover the extra person or persons, but frequently visitors for meals did not bring gifts. Usually no extra food would be bought, but each would have a little less, and when any of the usual eating group was absent, the amount per person was correspondingly larger.

Food gifts were of greatest value in households where there was lack of employment and little or no money income. If gifts of food or money were received frequently in such households the quantity or kind of food consumed there did not differ much from that of those where there was work.

All observations and recorded data show that households belonging to a group that displayed cohesion and which participated in networks of gift-giving were supported by reciprocal help in times of unemployment and shortage of money. Single households occupying single houses suffered most at such times, and had then to eat less and poorer food. This seems to vindicate somewhat the oft-maligned and often onerous system of honouring obligations to kin. There is much to recommend it where employment is uncertain and unemployment relief absent.

Appendix 1

Infant feeding

Langley's report (in Hipsley and Clements 1947) of infant feeding in Koravagi village in the Purari states that infants were breast fed until they were from twelve to eighteen months of age. Supplements were thought to be introduced early, perhaps as early as one week of age. The nature of the supplement followed the adult food pattern.

The infant was fed clear sago soup with a specially made small spoon. As soon as he can hold objects he is allowed to play with small sago sticks and encourage to suck them. At twelve months the Koravagi baby will be eating sago, taro, bananas, ripe papaw, crabs and fish. The last foodstuff permitted is coconut. (Hipsley and Clements 1947:103.)

Information on infant feeding habits at the camp was provided by the six women who were still breast feeding infants and by several women who had recently completed a lactation.

a. Pregnancy

Pregnancy was diagnosed by all women interviewed as the non-appearance of menstruation. Reappearance of menstruation after the birth of an infant was in these women delayed until after fourteen months. Often there was only one menstrual period before another pregnancy (see Table 20).

No attempt was made to collect information on the taboos on sexual intercourse during lactation. However, it seems unlikely that any would operate in this community which had made such a concerted effort to break with the customs of the past. The need for information relating to lactation, the ability to conceive during lactation, the part diet may play, etc., are discussed more fully in Hipsley and Kirk 1965.

Throughout pregnancy the women followed their usual activities. Of nine infants under two years of age, five had been born at a hospital in Port Moresby, two had been born in their own houses at the camp with the help of women relatives, and two had been born in the village before the women came to Port Moresby.

b. Lactation

Breast feeding was general and as in rural areas there was no rigid regime, the infant being allowed to suckle whenever he desired. However, these infants no doubt developed their own feeding pattern, as others who were apparently fed ad lib, have been observed to do. (Hipsley and Kirk 1965; Oomen and Malcolm 1958.)

Many of the mothers took their infants to the nearby Maternal and Child Health Clinic to be weighed and for medication of ills such as diarrhoea, or for some attention to bad cuts, sores, etc. Regularity of attendance at clinics was not checked, but where a lactation had failed and assistance was needed with feedings (usually powdered milk), the women attended each time more milk powder was required. Throughout the survey there was only one woman at the camp in this situation. The infant appeared to be well-nourished, but though the milk had been used as directed by the clinic, a bottle of vitamin drops had been used once only since it had been received some weeks previously.

Table 20

Return of menstruation in relation to age of infant

Age of present infant (months)	Remarks
9	Lactating; no return of menstruation.
9	Lactating; no return of menstruation. With previous child, menses returned approx. 18 months after birth, had one period only before becoming pregnant again.
12	Lactating; no return of menstruation. With previous child, had one menstrual period only before becoming pregnant again.
14	Lactating; no return of menstruation. With previous child, menstruation returned at 16-18 months for 5 or 6 months before next pregnancy.
14	Lactating; no return of menstruation.
18	Non-lactating for one month. At this time the infant was weaned. Has had no return of menstruation but suspected pregnancy. Subsequent observations confirmed this.
24	Pregnant; had one period only at approx. 16 months after birth of this infant.

The mothers ceased to breast feed when the child was about eighteen months of age. Lactation ceased at this time almost invariably because of another pregnancy. Once the decision to wean had been made the event was sudden; the child might even be sent to stay with another woman for several days.

c. Introduction of complementary foods

With the traditional foods unobtainable or difficult to obtain in the town, modifications have been made to the customary pattern of infant feeding. No special kind of food was prepared for the infant. If he was able to eat the food the adults were having this would be given to him, probably mashed. If he had not been introduced to the adult food item he was not given solid food.

Sweet potato was most commonly the first solid food given to the infants studied. This was mashed to a thin paste with a little water and fed to the child with a spoon. It was introduced when the child was approximately seven or eight months of age. This was followed by pumpkin, taro and banana prepared at first in the same way as the sweet potato, but later left solid when the infant could feed himself. Boiled rice and bread were given to the infants at any age between eight and fourteen months. By the age of eighteen months the infants were eating all adult types of food. Meat and fish were the last introduced.

Table 21 gives a list of the types of foodstuffs consumed during the survey by some infants of varying ages, together with an assessment of the protein, fat, calorie and water content of these food sources. It will be seen that these foodstuffs contributed significant quantities of nutrients.

Table 21

Complementary foodstuffs consumed during weaning period, showing nutrients thereby obtained

Age of infant (months)	Wt of infant (lb)	Present feeding pattern includes	Average nutrients from complementary foods*				
			No. of days	Protein g	Fat g	Calories	Water** g
9	19	Breast milk only					
9	14	Breast milk, sweet potato, taro, pumpkin, sweet biscuits	6	0.3	-	28	24.1
9	13	Breast milk, bread occasionally, rice	2	9.4	1.8	400	391.7
12	18	Breast milk, bread, tea, rice, sweet potato	2	7.1	2.5	328	400.3
14	19	Breast milk, sweet potato, potato, rice, tea, bread	2	10.5	2.8	497	622.1
14	18	Breast milk, banana, pumpkin, papaw, fish, sweet potato, rice	4	5.02	1.1	196	109.8
18	26	Banana, sweet potato, pumpkin, fish. <u>No</u> breast milk.	3	9.62	6.2	329	371.2

* The complementary foods from which these calculations were made do not include the entire variety of foodstuffs included in feeding pattern, but only those observed eaten over the survey period.

** Food water plus drinking water.

Appendix 2

The means of improving nutrition

While the camp people may be accustomed to the level of food intake measured in this survey, and this amount may be sufficient at this level of activity to maintain body weight, the thin appearance of these people, particularly of the older adults, suggests that the accustomed level is lower than is desirable. The first requirement is an overall increase in the quantity of food (i.e., an increase in food calories) rather than improvement in quality, although there is need for greater consumption of food such as leafy greens. It could be regarded as a major achievement to increase the quantity of food consumed while maintaining quality at the present level.

Nutrition education uses such agencies as women's clubs, schools and radio and requires the services of economists, agriculturalists and nutritionists, if not directly then through extension workers. Co-ordination of services ensures that ways of improving diets (e.g., by buying more or different kinds of food, or using other methods of food preparation) can be put into practice.

The success of any such program, no matter how well planned, cannot be assured. The people at whom the program is directed must have the motivation and the means to change. In India numerous well planned programs, including nutrition education, have been almost complete failures (Clements 1962; Nair 1962). The mood of 'reforming zeal' of the Tommy Kabu movement of the 1940s has passed. While people at the camp may not be unreceptive to new ideas their acceptance and practice may be expected to be slow.

A rise in real income is probably the most important prerequisite for the success of any nutrition improvement program. This would come with more regular and more skilled employment, but some seem to prefer non-continuous work. The consumption of more food at the camp can only be effected by the purchase of greater quantities. Limited land and poor soil precludes any significant increase in home-produced foods. Improved market facilities could ensure a larger and more constant supply of garden produce at a price within

people's means. Traditional foods are highly regarded by the camp people and are generally nutritious, but are at present a luxury.

Instruction in the wise allocation of income could be helpful, as experience in other developing countries indicates that an increase in real income has not necessarily meant improved nutrition for the family, and some of this failure to make better use of the increased income has been attributed to ignorance.

It is difficult to find, among the usual agencies, one through which such a program could operate for the camp. The women do not belong to women's clubs, few have radios or attend any kind of mother's club. School programs may have a future effect, but are unlikely to cause any change in present practices. Any program must be aimed towards the adult women responsible for the cooking and for making many of the food purchases but it is equally important that the men be included and persuaded to give their support to the program. A direct approach through an extension worker is a possibility. Language differences are not an important barrier, since nearly everyone speaks Police Motu.

Appendix 3

Rabia Camp example households

The two Rabia households described below illustrate the type of residence and employment changes that took place during the study.

Example 1

The head of household (1) had been living at the camp since he first came to Port Moresby in 1953. He had resided in this house with relatives until his return to Purari in 1960. He and his wife (2) arrived at the camp in 1961 and lived in the same house, with (1) assuming the status of head of the household in 1962 when the then head (15), his wife (16) and child (17) left to spend an indefinite period in their home village.

Count 1. The household consisted of six I'ai people: the head of the household (1), his wife (2), a woman relative (3) of the head's wife with her husband (4) and infant (5), plus a young niece (6) of the householder's wife left in her care while domestic difficulties were settled by the child's father. Number (4) had resided in another household at the camp since 1950, and had returned to the Purari for marriage in 1961. He and his wife (3) came back to the camp in 1962 and had lived in this house since then.

Neither (1) nor (4) was employed, but both had money from gambling successes.

Count 2. The child (6) had returned to her father, and there were four additions to the household: a younger brother (7) of the wife of the householder (2) had been living and working in another area of Port Moresby until his marriage to an I'ai girl (8), and they then came to live at the camp together with the father (9) of (7) and (2) who had been living with (7). A young woman relative (10) of the householder's wife had arrived to stay temporarily as her mother had recently died.

Although neither (1) nor (4) was employed, (7) was in continuous employment and remained so throughout the study. Number (9) was too old to work.

Count 3. A young man (11) who had been working as a domestic servant since 1961 and living at his place of employment in one of the suburbs of Port Moresby, became unemployed and arrived to live with his sister (3). The householder (1) had secured employment as a contractor's labourer with his neighbour at the camp. Number (4) remained unemployed.

Count 4. Both (1) and (4) were employed as labourers by a European contractor. There were no other changes.

Count 5. The father (9) of (2) and (7) had gone to hospital. There were no additions to the household but (4) was now unemployed and (1) had returned to work with the Purari contractor, while (11) continued to be unemployed.

Count 6. The only change from the previous count was that (4) had a job as a contractor's labourer.

Count 7. A male relative (12) of the householder (1) who was working at a European mess, received a visit from his Motu wife (13) from Borea, with their child (14) and during the visit of (13) and (14) this family of three came to reside in the house.

The wife (2) of the head of the household had gone to hospital; her husband (1) was not working but spent much of his time at the hospital. Number (4) was unemployed again.

Count 8. The visitors (12), (13) and (14) had returned to their place of work and village respectively; the householder's wife (2) had been discharged from hospital and had gone on a visit to Purari, accompanied by her father (9) who had been living elsewhere for some months.

The previous head of the household (15) returned from the Purari with his wife (16) and child (17) and he resumed his status as head. He had arrived only the day before the count and was unemployed.

Both (1) and (11) were employed by the neighbouring contractor, (4) continued to be unemployed and (7) continued to be employed.

Example 2

The household was one in which a Koriki man had just divorced his first wife, a Papuan woman from Rigo (50 miles east of Port Moresby), and had married the Motu (Baruni) widow of another Koriki man. He moved into the house at the camp where the widow had been living with her daughter and the latter's Koriki husband. He claimed that his former place of residence at the camp remained his property.

Count 1. The members of the household at this time were: (1) the ex-wife of the non-resident householder with their two sons (2) and (3) and an adopted infant (4). Numbers (1), (2) and (3) had been

at the camp since 1947. Also residing there was (5), a nephew of the head of the household, with his wife (6) and their five children, numbers (7-11); another relative (12) of the head of the household with his wife (13) and their child (14); and a young male student (15) who was not related to anyone in the house, but shared with the householder mutual affinal relations in another household. All of these (5-15) were Koriki people, and all had come to live at the camp since 1960.

Numbers (2) and (3) were employed as clerks, (5) was engaged in bakery work, and (12) was working as a labourer with a construction firm.

Count 2. The student (15) had moved to the home of his other camp relatives; (1) and (4) had been admitted to hospital, and the wife (16) of (2) had returned after a year from her village near Rigo, with her recently born child (17). Returned also after an absence of some four years was a male Koriki relative (18) of (5). This man was unemployed.

Count 3. By this time (1) and (4) had returned from hospital.

Count 4. A niece (19) of the houseowner's ex-wife (1) had arrived from Rigo, with her husband (20) whose home village was Kamari, near Hula (some 20 miles south-east from Rigo). He was employed at a dry-cleaning establishment.

Count 5. There were no changes in residents but there were in employment. Number (20) had changed his employment and was working as a salesman in a trade store, (12) was now working at a bakery. Numbers (2), (3) and (5) continued to be employed and (18) remained unemployed.

Count 6. A child (21) had been born to (12) and (13); (12) himself had been sentenced to Bomana Gaol for three weeks. The former wife (1) of the householder had married a Goaribari man working as a domestic servant in the suburb of Boroko, and both she and (4) had gone to live with him there.

Count 7. Number (18) had left the house and camp, but where he had gone nobody appeared to know. Numbers (19) and (20) had returned to their village and (12), having returned from Bomana Gaol, had obtained employment as an unskilled worker at the General Hospital.

Count 8. Number (2) had obtained a house in the suburb of Hohola, and he and his wife (16) and child (17) had moved there with his brother (3), the unrelated student (15), and the family composed of (12-14 and 21). There remained in the house the family unit (5-11). These were joined by the Koriki head of the household (22), his Motu second wife (23), the half-Koriki daughter (24) of his wife and the latter's Koriki husband (25) and the two children of this young couple (26, 27). These six people had been

residing elsewhere at the camp, where (23), (24) and (25) had resided since 1961.

These new residents were joined by (28), a younger brother of (22)'s father, and by (29), the son of (22) by an earlier marriage. Both (28) and (29) had been living in Port Moresby for some months. Number (22) had been unemployed for every count up to 7, and at counts 7 and 8 he was engaged under contract to dig a number of drains. Number (25) had been employed continuously during the entire count periods, (29) was working with (22) at count 8 and (28) was unemployed.

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