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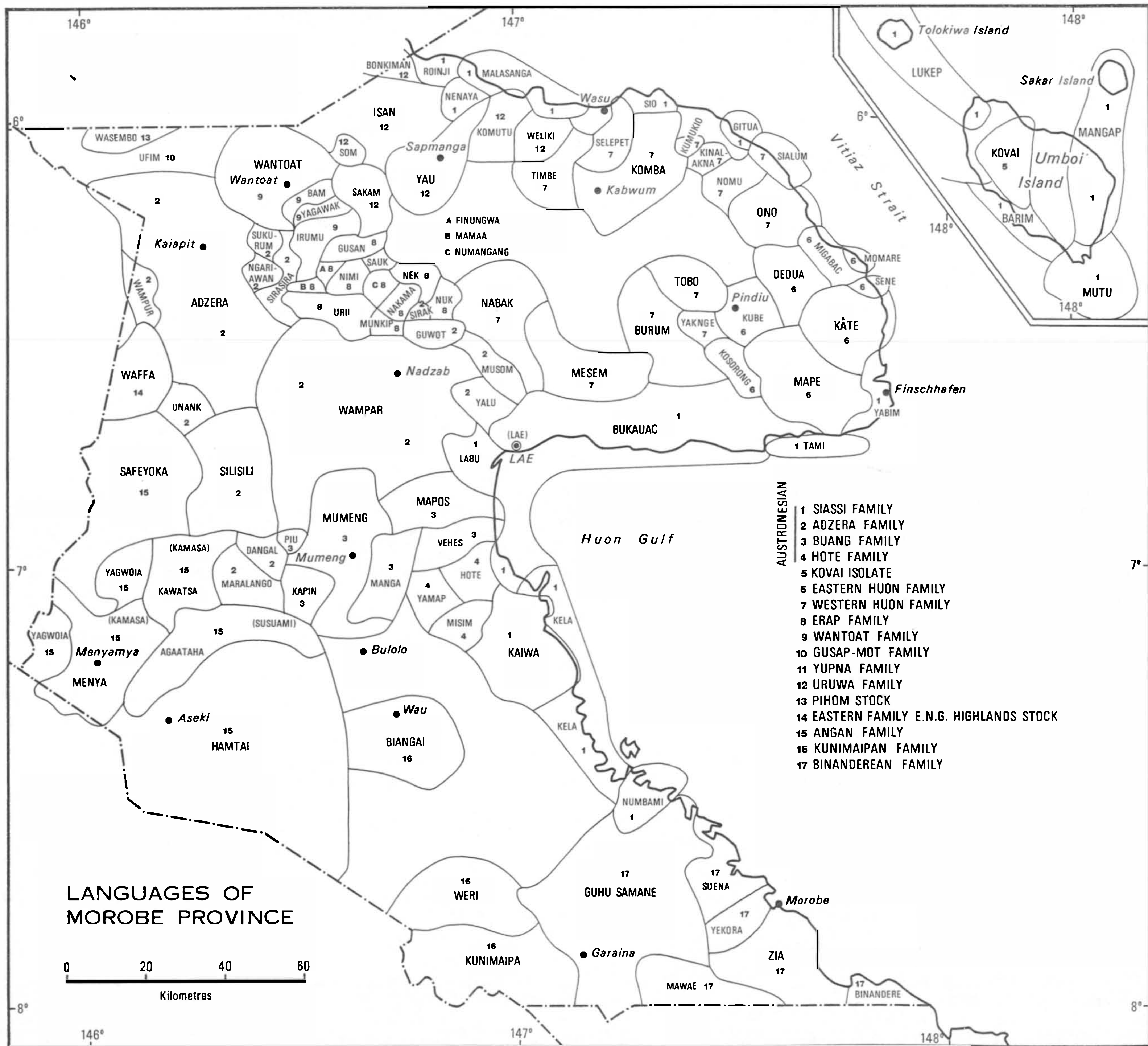
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LANGUAGES OF MOROBE PROVINCE



- AUSTRONESIAN**
- 1 SIASSI FAMILY
 - 2 ADZERA FAMILY
 - 3 BUANG FAMILY
 - 4 HOTE FAMILY
 - 5 KOVAI ISOLATE
 - 6 EASTERN HUON FAMILY
 - 7 WESTERN HUON FAMILY
 - 8 ERAP FAMILY
 - 9 WANTOAT FAMILY
 - 10 GUSAP-MOT FAMILY
 - 11 YUPNA FAMILY
 - 12 URUWA FAMILY
 - 13 PIHOM STOCK
 - 14 EASTERN FAMILY E.N.G. HIGHLANDS STOCK
 - 15 ANGAN FAMILY
 - 16 KUNIMAIPAN FAMILY
 - 17 BINANDEREAN FAMILY

Map of Morobe Province, Papua New Guinea, showing language distribution. The map is based on the work of the Linguistic Society of America and the University of Cambridge. It is a reproduction of a map published in 1975. The map is not to scale and is for reference only. It is not intended for navigation. The map is a reproduction of a map published in 1975. The map is not to scale and is for reference only. It is not intended for navigation.

MOROBE COUNTING SYSTEMS

GEOFFREY P. SMITH

INTRODUCTION

The aim of this paper is to investigate the counting systems of the Morobe Province, Papua New Guinea, and the relationship between these counting systems and the languages spoken in the area.

This investigation involved a number of stages. The first requirement was an exhaustive collection of counting data from all the languages of the province. Secondly, these data were categorised into a number of different types to demonstrate the variety of counting methods occurring. Thirdly, the distribution of the different types of counting system was correlated with the distribution of the various language families spoken in the province, and finally, the implications of this correlation for the culture history of North-East New Guinea were examined.

The idea for this research was a direct result of involvement with the Indigenous Mathematics Project, which was begun in 1976 by the Papua New Guinea Department of Education under the direction of Dr David Lancy, who was then Principal Research Officer. The Indigenous Mathematics Project had a number of aims, all connected with the relationship between traditional culture and cognitive ability, especially with respect to primary school mathematics performance. Help was enlisted from anthropologists, linguists, educationalists, psychologists and mathematicians, and the present writer contributed a small part of the resulting research (Smith 1978, 1980, 1981).

One of the cultural variables which was felt to be relevant to cognitive development was the traditional method of counting used in a society. Lancy notes (1978:6):

From its inception the Indigenous Mathematics Project has had as its goal to document the mathematics systems traditionally used in Papua New Guinea. Such systems are interesting in their own right but we felt they might also aid us in understanding the roots of cognitive variability in Papua New Guinea.

Information on counting systems was assembled by Lancy from a number of sources. Published accounts such as Kluge (1937-1942) and Wolfers (1972) provided surveys of some of the types of counting method employed by Papua New Guineans, and this was supplemented by unpublished material made available by the Mathematics Departments of the University of Papua New Guinea and the Papua New Guinea University of Technology. In addition, some studies of counting systems in

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individual cultures were carried out specifically for the Indigenous Mathematics Project, for example Cheetham (1978), Kettenis (1978) and Thune (1978). However, Lancy notes (1976:6) that the assembled data represented only about 30% of all the languages of Papua New Guinea. The present research was initiated to reduce this deficiency and provide additional data.

The Morobe Province was selected as the study area, as this is accessible to the University of Technology, which is located at Lae. The province is a political unit, not a linguistic or cultural one, and thus the boundaries are arbitrary from an ethnographic point of view. However, the size of the province made it suitable as a study area; there are 105 languages in the province, both Austronesian and non-Austronesian (see section 2.2). It was felt that the most significant contribution could be made by concentrating the survey on a limited but still considerable area of Papua New Guinea to obtain a complete set of data rather than a sample from a wider area. Reference is made to the situation in adjacent areas where this is relevant.

Collection of data was carried out as far as practicable from village informants in their own communities, and was supplemented by data from published sources and those provided by other linguistic field workers in the area, especially from the Summer Institute of Linguistics. Once collected, the counting systems were classified into several different types, and these data are now available for cognitive or educational research.

The main theoretical issue explored in this paper is the relationship between languages and counting systems in the province. Do closely related languages have similar types of counting systems? If not, what accounts for this discrepancy? Laycock (1977:219) suggests that no close correlation can be expected:

What is clear ... is that number systems, at least in the New Guinea area, afford few indications of genetic relationship of languages; closely related languages may show widely-differing systems.

With this statement in mind, the Morobe data were examined to see what types of counting systems are employed in the different languages and language families. A certain amount of consistency was found within some families, whereas in others the variety of counting types was more difficult to explain. In particular, the data from the Austronesian languages showed a puzzling range of types.

The paper begins with two introductory sections which serve to place the Morobe material in context. In section 1, counting in general is discussed. The historical development of counting methods in different cultures is followed by a review of research into counting systems, especially in the South-West Pacific area. Recent ethnographic studies of counting in Papua New Guinea are then described. Section 2 gives some background information on the Morobe Province. An account of its geographical features, population distribution and cultural characteristics lead up to the latest classification of Morobe's languages. The linguistic research which led to the formulation of this classification is briefly considered. Section 3 gives an account of research methods adopted for the purposes of this study. Details of how informants were selected, and of information gathering and transcription techniques are presented.

Sections 4 and 5 evaluate the data collected. In section 4, the counting methods of the languages of the province are classified into a number of different types, and in section 5, the distribution of these types in each of Morobe's language families is examined. Section 6 examines the implications of these findings for the culture history of the area, and suggests some possible explanations. These include the effects of language contact, and the economic and cultural needs of traditional societies.

1. COUNTING AND NUMBER

1.0 INTRODUCTION

This paper is concerned with counting and number and the relationship of these to language and to culture, in particular to that portion of North-East New Guinea known as the Morobe Province. Before considering data from Morobe, it will be instructive to get this study in its correct perspective, and this section looks at the significance of counting and numeral systems in the cultures of the world.

Firstly, a review of reconstructions of the counting systems of earlier cultures puts contemporary knowledge in historical perspective. Secondly there is an overview of counting and number in today's societies. A good deal of work has been devoted to the counting methods of the world, to regional surveys, ambitious global inventories, ethnographic studies and theoretical linguistic models. Some of these are considered in the remainder of the section, and provide a theoretical starting point for the later evaluation of data presented here.

1.1 A HISTORICAL PERSPECTIVE

Human beings have been using numbers for millenia, and it is possible to reconstruct some early counting systems from evidence left in writing. A great variety of written notations has been produced (Smith and Leveque 1970, Menninger 1977), and a brief review of counting systems known about from historical records is given here to provide a framework for considering the Morobe material. (See also Conant 1896, Boyer 1944, and Asimov 1977.)

The first attempts at counting presumably predated written records, and will always remain unknown. However, the earliest counting system indicated by a written form is a tally of marks, each representing a single object or event. Such tallies have been found among the most ancient inscriptions produced by man, such as cave paintings. The earliest written records from the Egyptian and Babylonian cultures around 3,000 to 3,500 B.C. contained tally marks for units up to nine, but also had a symbol for ten, showing that a decimal system of counting was probably already in use by this time. The decimal system, no doubt originating from counting the fingers of both hands, recurs in many different cultures, although other bases are also found.

The Romans were among those who used a base of ten, the symbol for which was X. Symbols for other numbers below this base were I for one and V for five. It has been suggested that V was derived from the shape of one hand held up with the thumb outstretched. Ten times ten was shown by the symbol C, and ten times ten times ten by M. In addition, there were symbols for 50 (L) and 500 (D). Thus the counting system used in Roman times was already quite a sophisticated one. To produce the written representation of a number, a simple grouping system was employed, where each symbol was repeated the required number of times. For example the number 73 was written:

$$\text{LXXIII} = 50 + 10 + 10 + 1 + 1 + 1$$

A smaller unit placed in front of a larger unit indicated subtraction, so that IV meant one subtracted from five, that is four. In addition to the Egyptian and Roman systems, Greek and cuneiform Babylonian systems also used clusters of symbols to represent numbers. Such systems were clearly much more convenient than simple tallies for recording large numbers, and Egyptian hieroglyphic symbols for one million are known. However, they did not allow easy computation, as digits were not represented by single symbols.

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Numeral systems employing a large number of symbols for multiples of the base evolved in several places. Egyptian hieratic numerals, the Greek Ionic or alphabetic system and Coptic, Hebrew, Hindu and early Arabic numerals were basically of this type, which may be referred to as ciphered numeral systems. For example, the Greek Ionic system had separate symbols for one to nine and the base ten, for multiples of ten from 20 to 90 and for hundreds from 100 to 900. One thousand was indicated by a bar. Such ciphered numeral systems required the memorising of a large number of symbols, but once this was achieved, computation was relatively easy.

The Ancient Chinese number system also had a base of ten, but had multiplicative grouping for numbers above ten. For example, to write the number 4,000, instead of repeating the symbol for 1,000 four times, the symbol for four preceded the symbol for 1,000. Thus the number 2,605 was written:

$$\begin{array}{cccccc}
 & \text{二} & & \text{千} & & \text{六} & & \text{百} & & \text{五} \\
 = & 2 & & 1,000 & & 6 & & 100 & & 5
 \end{array}$$

(Smith and Leveque 1970:758)

It is only a short step from here to the modern notation omitting the symbols for 100, 1,000 and so on, and using instead the position of the symbol to carry this information. However, the use of a symbol for zero is essential for a positional system to be unambiguous. The Babylonians employed a positional system four to five thousand years ago with a base of 60 and simple grouping to base ten within this (Thureau-Dangin 1939, Price 1961). However, there was no symbol for zero, and so the system was ambiguous. As will be seen in section 1.2.3, a base of 60 was also employed in the New Guinea area, and possible links between the two have been suggested. The Mayans of Central America used a sophisticated positional system with a base of 20 and the inclusion of a symbol for zero. It was used mainly for time calculation. However, the system's notation employed simple grouping of units to five, and thus was unsuitable for computation.

An improved decimal system with each digit represented by a single symbol and including a zero was based on ideas originating from the Hindus and reaching Europe via the Arabs around the 10th century. It is a base ten positional system, using the position of each symbol to determine the power to which the base has been raised. Moving one position to the left indicates the raising of the base to another power. For example, the expression 43,552 means:

$$\begin{array}{r}
 2 \quad \times \quad 1 \\
 + \quad 5 \quad \times \quad 10 \\
 + \quad 5 \quad \times \quad 100 \\
 + \quad 3 \quad \times \quad 1,000 \\
 + \quad 4 \quad \times \quad 10,000
 \end{array}$$

The modern positional decimal system is now almost universally adopted for trade, commerce, science and technology, and one is tempted to imagine that the system has now been perfected. However, Morgan (1982:221) points out that this system does not necessarily make arithmetical calculations as easy as possible, and suggests that if a subtractive system had been adopted, computation would be much easier. Counting would proceed as follows: one, two, three, four, five, four less than ten, three less than ten, two less than ten, one less than ten, ten, ten and one, ten and two, and so on. The corresponding numbers in written form would be: 1, 2, 3, 4, 5, 14*, 13*, 12*, 11*, 10, 11, 12, etc. This is rather similar to the way time is calculated by using such expressions as

'twenty past two', but 'twenty to three'. Such a numerical system would reduce the number of symbols needed, and is claimed by Morgan to make arithmetical calculations easier to learn. It is interesting to note that a subtractive component was a feature of the Roman system and is also present in some 'incomplete decimal' systems found in parts of Melanesia (Firchow, n.d.).

Although the decimal system is the dominant system in the world today, a binary system using only the symbols 0 and 1 is more appropriate for certain applications. Binary numbers are positional in a similar way to the decimal system described above, but have only two instead of ten symbols. For example, the expression 110,101 means:

$$\begin{array}{r}
 1 \quad x \quad 1 \\
 + \quad 0 \quad x \quad 2 \\
 + \quad 1 \quad x \quad 4 \\
 + \quad 0 \quad x \quad 8 \\
 + \quad 1 \quad x \quad 16 \\
 + \quad 1 \quad x \quad 32 \\
 \hline
 = 53 \quad \text{in decimal notation}
 \end{array}$$

Binary digits, or 'bits', making use of the choice between only two alternatives, are suitable for on/off or yes/no systems used, for example, in computer technology.

1.2 RESEARCH ON COUNTING SYSTEMS

1.2.1 A GLOBAL VIEW

The variety of counting systems in the world has engaged the attention of researchers and scholars for some time, and there have been a number of attempts to provide comprehensive accounts, for example Pott (1847) and Schmidt (1926). The most notable attempt was that of Kluge, whose monumental five-volume collection (1937-1942) represents a significant part of his life's work. It is unfortunate that much of the information contained in these works was obtained from sources whose reliability is doubtful. The cultural context of counting is largely ignored, and very little information was collected by the authors themselves. Seidenberg's more recent work (1960) continues in the same tradition, and even at this late date it was possible for him to state that 'many groups of savages cannot count beyond two' (p.216). His data from the New Guinea area are somewhat out of date, and classifications, such as whether finger counting begins on the left or right hand, or on the thumb or the index finger are of doubtful value.

Some reviews of counting practices in particular regions of the world have also appeared. An account of counting in American Indian languages can be found in Dixon and Kroeber (1907). Counting in the African region was reviewed by Schmidl (1915), while the New Guinea and Pacific region also received attention from Codrington (1885) and Ray (1907).

Detailed ethnographic studies of counting in action in different societies have recently provided a much more useful data base. An example is Araujo's (1975) description of the Basque method of counting sheep. Similarly, Zasalavsky's study (1973) of counting and pattern in Africa relies on careful participant observation, unlike Schmidl's earlier survey. She notes that the development of numeracy in many West African societies is greatly assisted by a variety of 'mathematical recreations', such as the construction of 'magic' number squares, or playing board games involving strategies of the 'backgammon' variety. A number of finger symbols are described, which are quite

distinct from the marking off of fingers during tallying. A certain finger held in a definite position unequivocally represents a certain number, and thus the finger symbols represent a kind of numeral notation. A variety of detailed ethnographic studies in the New Guinea area have been carried out, and will be briefly described in section 1.2.3.

1.2.2 LINGUISTIC STUDIES

Numeral systems have also been examined from a purely linguistic point of view. Salzmann (1950) introduced a method for the analysis of numeral systems based on three types of pattern. According to his theoretical model, the 'frame pattern' describes the succession of morphemes in a numeral, while the 'cyclic pattern' is roughly equivalent to the concept of base. Finally the 'operative pattern' shows the arithmetical processes by which numerals are constructed. Corstius (1968) includes a number of papers which adopt a generative or transformational approach to the analysis of numeral systems in various European, American and Asian languages, while Hurford (1975) and Stampe (1977) adopt a similar generative approach. The latter makes a number of generalisations on the basis of his analyses, for example that higher numbers tend to act more like nouns, while lower numbers act more like adjectives. Dorothy Hymes (1955) examined 40 American Indian languages and analysed their number systems. All were decimal systems, but only some had a complete set of numerals, while the others were classified by the way the numerals six to nine were constructed. In the process of this analysis Hymes found Salzmann's model inadequate for her purposes.

The most comprehensive linguistic study of counting systems is part of Greenberg's (1978) work on language universals. Drawing on an extensive and accurate data base, he formulates 54 generalisations about number systems as they occur in the languages of the world. Ironically, it is the very first generalisation, that 'every language has a numeral system of finite scope' with which Comrie took issue in a recent review (1980:836). It was pointed out that the English system can theoretically proceed infinitely, and therefore does not conform to this generalisation. Some of the generalisations are concerned with somewhat specialised aspects of linguistics, but others are of more general interest. The fourth generalisation, for example, states that in every system, at least some numbers receive simple lexical representation, that is that all languages have some number words. This contradicts older ideas to the effect that certain languages do not have numbers, but the limit may be remarkably low. The Macro-Ge language of Brazil is the single case of a language reported to have number words only for 'one' and 'many'. Systems involving tallying on the hands and feet are examined by Greenberg, and he distinguishes verbalisations of this kind of tallying procedure from other types of numeral series, stating that:

In these and similar instances it seems that numerals are never used without their accompanying gestures, and the gestures are often used without verbalization. It seems doubtful that such expressions are used attributively to nouns in sentences.

Also of interest with respect to the Morobe data are the following observations from Greenberg (1975). It is stated that higher numerals are more commonly borrowed than lower ones, usually in a sequence starting at a certain point (p.288). Some examples of this type of borrowing will be discussed in section 6. Evidence is also given for a certain psychological reality attached to the notion of 'base' (p.289). This can be seen, for example, in the case of the replacement of the Benue base twelve system by the Hausa base ten system in West Africa. Instead of the last two numerals of the series being abandoned, as would seem logical, the old word for twelve was used to mean ten, the new base, while the old words for ten and eleven were dropped. Similarly, the old higher base of

144 became the new word for 100. In Morobe, a similar phenomenon is apparent when considering bases of twenty and ten in some languages (see Appendix A). Finally, generalisation number 35 states that 'if 1 is expressed as a multiplier with a particular base, it is expressed with all higher bases' (p.178). This appears to be contradicted by some of the Morobe data, for example in the Mutu language, where a base of 20 is used with one as a multiplier, whereas the higher base of 400 apparently is not (see Appendix A).

1.2.3 THE NEW GUINEA AREA

1.2.3.1 SURVEYS OF COUNTING SYSTEMS

As noted in the introduction, knowledge about the counting systems of the New Guinea area (that is the island of New Guinea and adjacent islands to the north and east) is by no means complete, but information is available from a number of sources. Since there is no written evidence of past systems, information about earlier periods comes from accounts by visitors to the region, such as missionaries, anthropologists or linguists, and from oral tradition.

The first research into the counting systems of an area usually coincided with the first linguistic research, as some number words were, and still are, included in most vocabulary lists when carrying out even the briefest language survey (see Laycock 1970:1157). Body counting systems, being somewhat exotic to Europeans, caught the attention of early missionaries and anthropologists, and there are published accounts of some of these, for example Aufenanger (1938, 1959), Kirschbaum (1938) and Williams(1940-1942). In addition to notes on individual languages or systems, there have been some attempts at surveys and classifications of counting systems in the region, for example Codrington (1885), Ray (1907), Kluge (1938-1942), Galis (1960) and Wolfers (1969, 1971, 1972).

The earliest attempt at a classification of counting systems on the island of New Guinea appears to have been that of the linguist Sydney Ray (1907) following his visit to the area as part of the second Cambridge Anthropological Expedition to Torres Strait in 1898. His survey was based on data he obtained from the Western and Central areas of Papua (then British New Guinea) as well as from Torres Strait, and from all available manuscripts from the British New Guinea area. Ray modelled his investigation of counting methods on that of Codrington, whose *Melanesian Languages* appeared in 1885. Codrington's data covered the 'Melanesian Islands', which comprised Fiji, New Hebrides (now Vanuatu) and the Solomon Islands.

Ray claims the first use of the terms 'Papuan' and 'Melanesian' to describe the two basic language types of the area in his 1892 address to the International Congress of Orientalists in London (Ray 1907:287). The terms correspond to what were later usually known as 'non-Austronesian' and 'Austronesian'. The term 'non-Austronesian' was adopted to avoid the implication that the group was made up of related languages, but instead implied that it included all those languages which were not Austronesian. Later, as more genetic relationships were established, the term 'Papuan' regained popularity among some authorities (Wurm 1975:4). One of the criteria Ray used to distinguish speakers of Melanesian languages from those of Papuan languages was the type of counting system used. He notes (1907:283) that for Papuan languages:

Distinct numerals are in use only for 'one' or 'two', rarely 'three'. Higher numbers are remembered by using parts of the body as tallies.

For Melanesian languages, on the other hand,

Numbers at least as far as five are counted. Though counting is performed on the fingers, other parts of the body are not used as tallies.

A considerable amount of material is analysed by Ray from the non-Austronesian languages of the Trans-Fly area, the Papuan Gulf and Central and Eastern Papua, and for each language a list of numeral terms is given. In addition, several body counting systems are described. Ray's data sometimes appear to contradict his conclusions, and the method used to elicit numerals is not described, but some possible sources of misunderstanding which may arise when collecting data are discussed by Codrington (1885:222). It is possible that some words in Ray's lists refer to the individual names for fingers or body parts rather than numerals. At any rate, the issue of the lack of numeral words in Papuan languages appears to have been pre-judged, as Ray dismisses any exceptions as being due to 'borrowing', 'imperfect knowledge' or 'imitation' (1907:463).

Ray devotes considerable attention to the counting systems of the Melanesian languages of British New Guinea. His previous criteria notwithstanding, he notes that in some Melanesian languages there are 'traces of a former inability to count beyond three', where languages have been 'modified by other, perhaps Papuan languages' (1907:463). The significance of this observation for the culture history of the area is taken up in detail in section 6. Following exactly Codrington's (1885) classification, four types of counting system are distinguished in the Melanesian languages: the quinary or base five, the imperfect decimal, the perfect decimal and the vigesimal or base twenty systems. Characteristics of these four types can be summarised as follows:

The quinary system was distinguished by Codrington on the basis that 'ten' was referred to as 'two fives', as for example in the Fate language of the New Hebrides. However, no unit is described as equivalent to 'five times five', and it is thus not a base five system in the logarithmic sense. It is more likely to be a stage in a vigesimal or base twenty system. Such systems usually employ counting on the fingers and toes as far as twenty, or 'one whole man', while higher numbers continue on another body. Ray notes that in some languages included in his vigesimal group, multiples of five are used to indicate ten and fifteen, while in others, paraphrases indicate the number of fingers and toes marked off. Systems which have a separate word for ten, such as Dobu, are distinguished from those which do not, for example Wedau. Imperfect decimal systems have a base of ten, but some words, usually six to nine are not distinct lexical items, but are combinations constructed from previously used elements. This construction may involve the following processes (Ray 1907:465):

(a) addition, for example Sinaugoro:

6 = *imaima sebona* = five one (5 + 1)

7 = *imaima lualua* = five two (5 + 2)

(b) multiplication, for example Roro:

6 = *aba-aihao* = two three (2 x 3)

8 = *aba-bani* = two four (2 x 4)

(c) subtraction, for example Hula:

7 = *mapere kaula vaivai* = one less four four (8 - 1)

9 = *mapere-ka-gahalana* = one less ten (10 - 1)

'Pure' or 'perfect' decimal systems in which there is a base of ten and separate words for all numerals from one to ten are not common in the area, and Ray notes only three examples, although

Codrington has several examples from Fiji, New Hebrides and especially the Solomon Islands (1885:236). Ray's examples are all from the East Papuan Island region. Two are from Melanesian languages on Brierly and Tagula (Sudest) Islands, and one is from a Papuan language spoken on Rossel Island called Yela by Ray, and now usually referred to as Yeletne (Henderson 1975). On Rossel, the words for one, two and three are not of Austronesian origin, while the words for four to ten appear to have been borrowed from neighbouring Austronesian languages. In Misima and Panaieti, an imperfect decimal system is used for numbers below ten, but the words used for counting tens up to 100 constitute a perfect decimal series.

Evidence of counting to higher numbers involving progressive powers of ten (100, 1,000, 10,000, etc.) is also presented by Ray. A word for 100 is given in several languages of the Central Papuan coastal region, for example Hula, Motu, Roro and Keapara, all of which have 'imperfect decimal' systems as far as ten. 'One thousand' is translated as *daha* in Motu, *raha* in Hula and *daga* in Sinaugoro. In Motu, a word *gerebu* was given for 'ten thousand' (the Hula word *rabuia* probably meant 'don't know') and *domaga* for 'one hundred thousand'. The latter may, however, be the word for 'too many' or 'an excess'. If these words were used as described, it would imply the existence of a sophisticated base ten system. However, no observations of people counting as far as these large numbers were documented.

Later surveys supplemented Ray's pioneering work. From 1937 to 1942, Kluge published accounts of a wide-ranging survey of the world's counting systems. The second section, 'Die Zahlenbegriffe der Australier, Papua und Bantuneger' (1938) and the fifth section, 'Die Zahlenbegriffe der Sprachen Central- und Sudostasiens, Micronesiens, Melanesiens und Polynesiens' (1942) contained data from the South-West Pacific area. As noted in section 1.2.1, the questionable accuracy of sources consulted during compilation of these works detracts from the value of the data presented, and classifications based on them.

Specifically in the New Guinea area, Galis (1960) carried out a comprehensive survey of the counting systems of the western half of the island of New Guinea and offshore islands, then known as Dutch New Guinea, now the Indonesian province of Irian Jaya. Drawing on earlier work by Friederici (1913), Frobenius (1935) and Kluge (1942) as well as more recent data, Galis classified the counting systems into six types, and also included a map showing how these were distributed. The six basic types in his classification were as follows:

(1) Body counting systems

(2) Simple base two systems (1, 2, 2 + 1, 2 + 2, 2 + 2 + 1, etc.) which he referred to as the 'Australian type' because of the use of this type of system in many Australian languages.

(3) A base-six system found only on Fredrik Hendrik Island and in the extreme south-eastern corner on mainland Dutch New Guinea. This is confusingly called the 'Melanesian type', and its unusual distribution is used as evidence to support certain migration theories.

(4) A base-four system found only near Hollandia (now Jayapura) referred to in the translation from Dutch as the 'tetraden type'.

(5) A base-five-twenty system using hands and feet until 'one man' is reached.

(6) A 'perfect' decimal system with a base of ten and separate words for one to ten. This is referred to as the 'Austronesian type', and is described as relatively modern and imported, although 'the words used are Old Austronesian and the languages remain Papuan' (Galis 1960:150). This appears to be another case of the borrowing of a complete set of numeral terms.

The base five-twenty system is described as the most widespread, and the body counting system as 'probably the most primitive' (Galis 1960:150). Galis also makes the observation that people are frequently familiar with more than one system.

A survey of the counting systems of the whole of what was then the Territory of Papua and New Guinea was made by Wolfers, and in his publications (1969, 1971, 1972) a number of basic types are distinguished. Several tallying devices are described where sticks, knots or marks represent various items of importance. Included with the tallying devices are the body counting systems, for example that of the Telefomin, and counting on the fingers and toes. A detailed account of the parts of the body used in the Kewa system is given. Different numeral systems are classified according to their base. These included bases of two, e.g. Kiwai; three, e.g. Bine; five-twenty, e.g. Wedau; and following Ray, 'perfect' and 'imperfect' decimal systems. The five-twenty systems sometimes have a word for ten, for example Suau, and are sometimes built up from a base two system, for example Kamano. Some other bases are also described.

Wolfers distinguishes rather carefully between systems which have a base and those which have a modulus, depending on whether or not a completed total is 'carried'. It appears, for example, that some users of body systems can readily assign numbers higher than the base to their correct position in the body sequence, thus mentally carrying the base, whereas others need bodies to be physically present to be able to do this, indicating that the system has a modulus. However, Wolfers' distinction does not appear to be very clear-cut or very useful. It seems likely that informants differed in their familiarity with the systems they were describing, which may have accounted for some of the distinction. In the present study, the word 'base' is used in both these situations, and indicates any number which acts as a grouping total. Where necessary, further description indicates whether progressive powers of the base are used or whether it involves merely addition. For example, a system which progresses 1, 2, 2 + 1, 2 + 2, 2 + 2 + 1, etc. is described as a base two system, although it is clearly not the same as a binary system where powers of the base, 2 squared, 2 to the power of three, etc. are used.

Some interesting examples are given by Wolfers (1972) of systems which do use progressive powers of a base, although the powers of ten of the Central Papuan coastal region reported by Ray are not mentioned. The Huli of the Southern Highlands are described as having a base of 15, not derived from body counting (but see Cheetham 1978), and proceeding as far as the base squared ($15 \times 15 = 225$). The Gembadi and Semariji of the Trans-Fly area are described as employing a base six system for counting yams where progressive powers of six are employed. Two men carry three yams each to make a unit pile of six. This is repeated six times to make one *peta*, and the series continues from here:

$$\begin{array}{lll}
 6 \times 6 & (6 \times 6 = 36) & = 1 \text{ } \textit{peta} \\
 6 \times \textit{peta} & (6 \times 6 \times 6 = 216) & = 1 \text{ } \textit{tarumba} \\
 6 \times \textit{tarumba} & (6 \times 6 \times 6 \times 6 = 1,296) & = 1 \text{ } \textit{dameno}
 \end{array}$$

Williams (1936:226), who originally documented this system, notes that there is a practical basis for counting out such a large number. One *dameno* is considered to be an adequate quantity to provide sufficient planting material for the following season, as well as being a public demonstration of gardening prowess.

In Wolfers' account of the unusual base three system of the Bine of Western Province he states (1972:218): 'There are a few systems with numbers that are wholly abstract with bases not anatomically derived' and gives the Bine system as an example of this:

- 1 *iepa*
 - 2 *neneni*
 - 3 *nesae*
 - 4 *nesae iepa*
 - 5 *nesae neneni*
 - 6 *nesae nesae*
 - 7 *nesae nesae iepa*
- etc.

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SCHOOL OF PACIFIC STUDIES

However, this conflicts with Ray's data from 1898. Using the name Kunini, which is the main Bine village, he recorded the system as follows:

- 1 *iepa*
- 2 *neneni*
- 3 *nesae*
- 4 *neneni neneni*
- 5 *imegube* (hand)
- 6 *matemate* (wrist)
- 7 *nawenawe* (elbow)

and thence to a body counting series (Ray 1907:229). A possible explanation for this is that the body element has dropped out of use, probably due to the adoption of English base ten numerals, and only the three original numeral words have been retained.

Wolfers notes that the same group of people may use different systems for different purposes. An example comes from the Austronesian-speaking people of the Duke of York Islands, where people normally count by tens, but count coconuts, taro and yams by fours, and shell money by sixties. He also comments that many groups now employ the decimal system with English or Tok Pisin words, or occasionally translated vernacular versions, for most non-traditional purposes.

The most recent reviews of counting in Papua New Guinea are by Laycock (1975) and Lancy (1977). Laycock reviews previous accounts of the various systems and provides some new data from the Sepik and other areas. Body tally systems from ten areas are compared. He also describes the Buin system, a decimal series which has different sets of number words according to the class of noun qualified. The Buin language has words for '1,000' (*kukurei*) and '10,000' (*taarina*), giving it one of the most extensive counting systems described for Papua New Guinea in spite of the fact that it is one of the non-Austronesian languages, which are not normally noted for the extent of their numeral series. It would appear that the influence of neighbouring Austronesian languages is involved here, and as noted in the introduction, Laycock comments on the variety of counting methods which may be found in closely related languages.

Lancy (1977) has unpublished data at his disposal which are said to constitute a representative sample from all the different provinces of Papua New Guinea, even though the percentage of the total number of languages in the country (about 30%) is fairly small. He classifies the counting systems into four basic types, and the approximate distribution of each type is indicated. Lancy's classification is as follows:

Type I constitutes systems using body parts as tallies. These systems are found in the Southern Highlands, West Sepik and Madang Provinces. (Enga could also be added.)

Type II systems employ named sets of objects of fixed size, for example the Kilenge group of four coconuts, or tallies of objects, for example the bundle of sticks described for the traditional Kiwai system. In addition there are only a small number of numeral words. The occurrence of type II systems without the use of additional systems is said to be characteristic of Western, Gulf and West Sepik Provinces.

Type III systems are described as 'true' counting systems, and usually have bases of five and twenty, employing the fingers and toes as aids. They are typical of Morobe, East Sepik, Eastern and Western Highlands, Northern, Milne Bay and New Ireland Provinces. This conflicts slightly with Wolfers' classification, where such systems are grouped with other types of tallying.

Type IV systems have a base of ten and employ no body parts, but use several discrete number words (that is, they include both the 'imperfect' and 'perfect' decimal systems). They are said to be typical of Austronesian languages of the New Guinea islands and East Papuan region. (The Central Papuan coast could also be added.) Some of the series described for Manus display several powers of the base ten, as does the Buin system described above.

Lancy, like Wolfers, notes that different systems may be used in the same society for different purposes, and he gives two examples from the North Solomons Province. The Buin, who normally use a type IV system, use a type I system for measuring shell money and on Petats Island, where a type IV system is also normally used, a type II system is used for counting coconuts. (This system also has parallels in the Morobe data.) He notes that in most of Papua New Guinea it appears that Tok Pisin or English numbers are fast replacing the indigenous systems. Where traditional systems are retained, they tend to be of type IV.

The above surveys provide a good introduction to the types of counting system in Papua New Guinea and adjacent areas, and a remarkable variety of systems emerges. As well as tallying devices and body counting systems, numerical bases of two, three, four, five, six, eight, ten, fifteen, twenty and sixty are described.

1.2.3.2 ETHNOGRAPHIC STUDIES

In addition to general surveys, a number of more specific studies of counting and numeration in various societies give useful insights into the way counting takes place. A mere statement of the words used in counting gives little indication of the importance attached to counting and number in that society, and some in-depth studies, which have only relatively recently been carried out, remedy this deficiency to some extent. Kettenis (1978) notes that most Kilenge are confused by their traditional counting system and that Tok Pisin numerals are more commonly used for most purposes. However, traditional systems of grouping taro in twos and breadfruit, coconuts or sewn sago leaves in fours are still widely used. Panoff (1970) also describing a New Britain society, the Maenge, likewise noted that only a few old people were fully familiar with the traditional method of counting. Thune (1978) comments on how little the potential of their counting system is utilised by the Loboda, even for traditional purposes.

By contrast, Pospisil (1963, 1978) reports that the Kapauku of Irian Jaya have many and frequent uses for counting and notes (1978:94): 'people show a peculiar obsession for numbers and a craving for counting'.

The Kapauku have a decimal system as far as the base of 60, with higher units of 600 and 3,600. The similarity of this method of numeration to that of the Ancient Babylonians (see Price 1961)

prompted Price and Pospisil (1966) to describe the Kapauku system as a possible 'survival' in New Guinea of this feature of Babylonian culture. Bowers and Lepi were not convinced, and in a somewhat scornful criticism commented (1975:322):

We deplore the racist implications of Price and Pospisil's fanciful effort to derive Kapauku numeration from Babylonia and feel that a better understanding of the Kapauku system could be obtained by examining counting in its present context among the Kapauku and their neighbours.

Pospisil and Price defended their position (1976:382), pointing out evidence for the borrowing of numeral sets in the Kapauku language, but the last word remained with Bowers (1977) who systematically challenged the validity of their arguments.

Like the Kapauku, the Huli of the Southern Highlands are described as having an almost obsessive preoccupation with counting (Cheetham 1978:24). He described how seedlings of a newly introduced plant or ducklings on a pond would be counted daily, even by children who appeared too young to go to school. He elaborates:

The Huli are very conscious of how much they possess, and it is therefore not surprising that they place great importance on counting. Compensation claims, too are a very frequent occurrence, and these involve marking a price to be paid back.

The Huli system has a base of 15 (Wolfers 1972), but Cheetham notes that the last three numerals of the series, 13, 14 and 15, are also the words for body parts, even though these body parts are not referred to when counting, and the words now appear to be true numerals. Cheetham conjectures that the following development may have taken place. Formerly, counting took place on the fingers of one hand with six indicated by placing the completed hand on the chest. This was repeated on the other side to give the original base of twelve. At some time in the past, the base twelve system was expanded to one with a base of fifteen by the incorporation of the three body counting elements. Today, multiples of fifteen are used in counting up to *ngui ngui* 'fifteen fifteens' and occasionally beyond this when counting pigs. However, expressing numbers intermediate between the multiples of fifteen is quite cumbersome, and the decimal system is reported to be gaining ground.

Franklin and Franklin (1962) describe the Kewa counting system in use. In addition to a body tallying series, there is also a base four system which uses the fingers of the hands without the thumbs. The body system is only used for specific purposes such as calendar reckoning, when points on a cycle of ceremonies are determined, and informants generally could not give a body-part equivalent of a base four number (1962:189). A variation on this system is described by Pumuye (1975), who also gives a detailed account of the Kewa calendar (1978). Biersack (1968) gives an account of the counting system of the Paiela of Enga Province, and attempts to explain why the body is used in counting in terms of the function of abstraction in the Paiela language. This theme is later ingeniously developed (1980, 1982) taking into account the perspective of cybernetics and information theory. Strathern (1977) gives an account of the mathematics of the *moka* ceremonies of the Western Highlands, and further details appear in Lancy and Strathern (1981). The counting system of the Upper Kaugel valley is described by Bowers and Lepi (1975). These important studies will be referred to again in section 6, where the significance of the cultural context of counting is examined.

Some other studies look at specialised aspects of counting in individual cultures. Fillery (1969) looks at the Kuman counting system from the point of view of a primary teacher in the Chimbu Province and considers implications for the teaching of mathematics in the area. May and Loeweke

(1967) use Fasu number concepts as a starting point for educational materials dealing with the introduced decimal money system. The writer (Smith 1978) observed that although the Kiwai traditionally used a simple base two system of counting, number markers in the grammar are unusually complex. Saxe (1979, 1980, 1981) examines the Oksapmin body counting system from a cross-cultural point of view. His 1979 paper compares the acquisition of number by children in Oksapmin and America. He concludes that in both cultures there is an imitative, pre-quantitative use of counting before the child coordinates progressive summation with the recitation of numerals words, and that the development of this coordination involves similar psycholinguistic processes.

1.3 PROSPECTS FOR FURTHER STUDY

The Indigenous Mathematics Project has given a considerable stimulus to studies of counting and other cognitive phenomena in Papua New Guinea, and it is likely that further ethnographic studies in the country will devote some attention to these areas.

The study of traditional counting practices is now part of the grade 7 mathematics syllabus in Papua New Guinea's provincial high schools (Britt 1981) and students are encouraged to record counting systems they are familiar with from their own areas. However, there seems to have been no systematic attempt to collect these and make them generally available. It is hoped that more data will become available in the future, from this and other sources, to allow a comprehensive survey of all the counting systems of Papua New Guinea to be made. In addition, the relationship between traditional counting methods and subsequent performance in primary school mathematics and other cognitive tasks has not been fully developed, and would be a fruitful area for further research.

2. THE MOROBE PROVINCE, ITS PEOPLE AND LANGUAGES

2.0 INTRODUCTION

This section introduces the Morobe Province and some of its cultural, geographical and political features. The first section looks at its landscape, population and communications, and this is followed by a consideration of the cultures of Morobe as described in ethnographic studies. The second section looks at the languages of the province; how the complex linguistic situation was gradually deciphered to yield the latest classification. Finally, some other linguistic considerations, such as the effects of multilingualism, the role of lingua francas and the future of small language groups, are discussed.

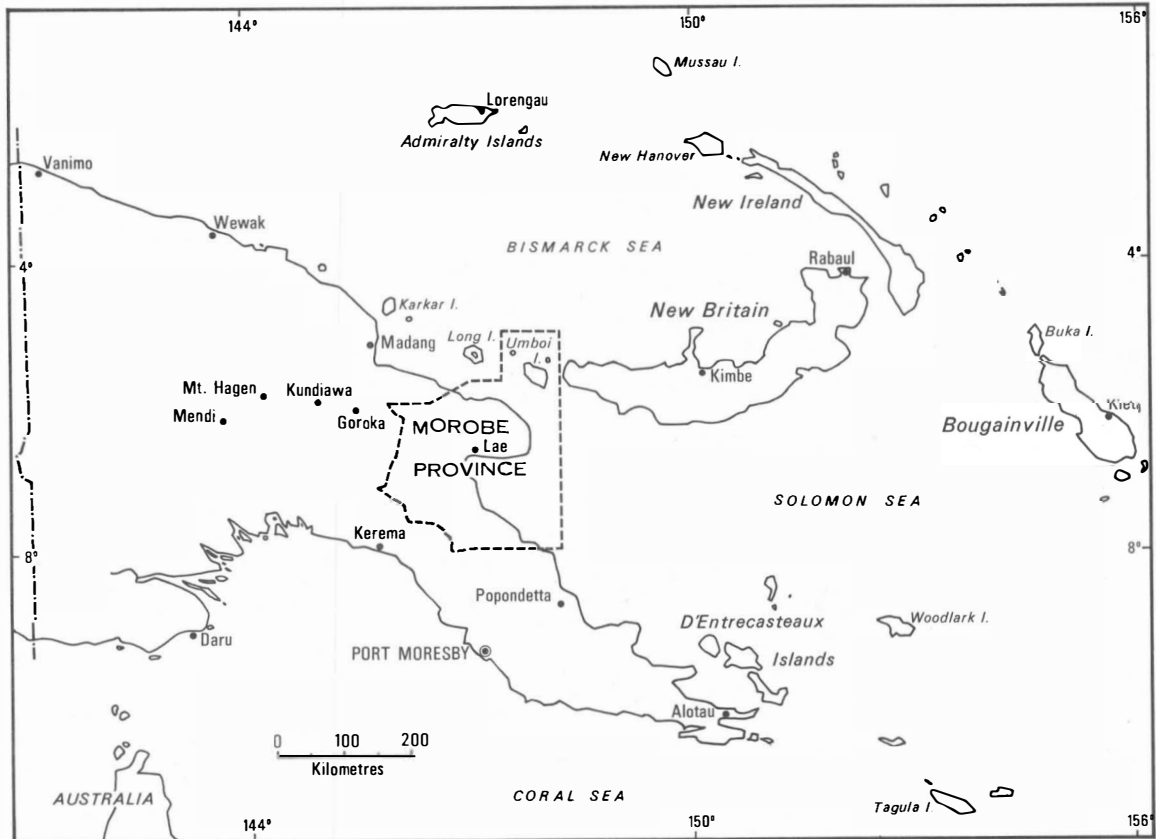
2.1 MOROBE PROVINCE AND ITS PEOPLE

2.1.1 GEOGRAPHICAL AND POLITICAL FEATURES

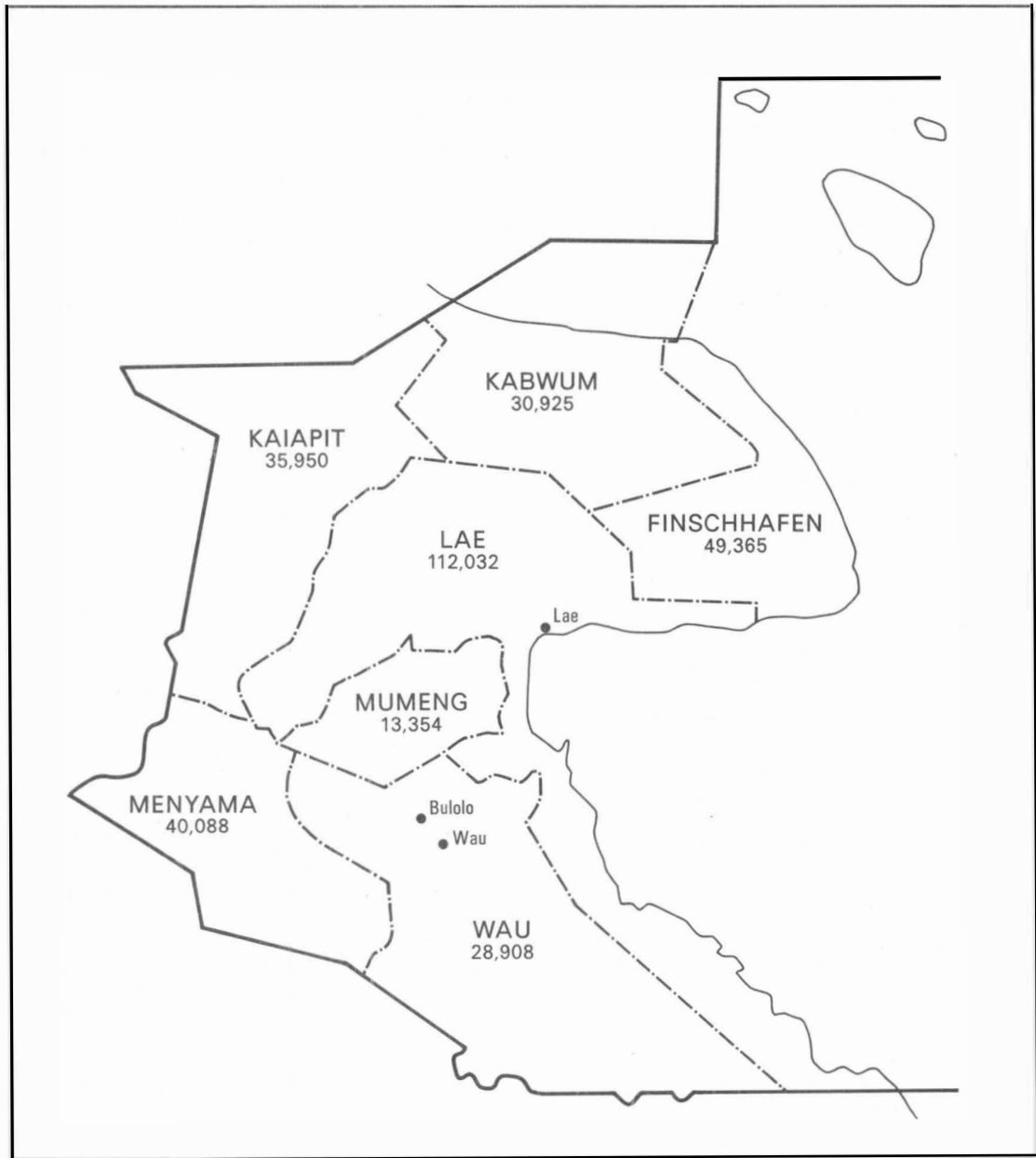
Papua New Guinea is divided into 19 provinces, formerly known as districts. The Morobe Province is the largest in population (310,526 according to the 1980 census), and one of the largest in land area (34,500 square km). It is also one of the most diverse in geographical features, containing within its boundaries coral reefs and islets, volcanic islands, lowland grassland and forest, wide river valleys, mountain forest, spectacular limestone gorges and peaks of over 4,000 metres. The broad Markham valley divides the province roughly down the middle. To the north-east of this lies the Huon Peninsula, with its precipitous Finisterre and Saruwaged Ranges, and off the east coast of the

peninsula lie the coral and volcanic islands of the Siassi District. To the south-west of the Markham lie the Bowutu, Kratke and Herzog Ranges, the Bulolo, Wau and Garaina Valleys, and the densely populated Aseki and Menyamyia area around the Ekuti Dividing Range. The province is divided into seven districts, formerly known as sub-districts. Map 2 shows these districts with their population figures from the 1980 census.

Five other provinces in mainland Papua New Guinea have land borders with Morobe. They are the Madang, Eastern Highlands, Central, Gulf and Northern Provinces (see Map 1). In addition there is a sea boundary with West New Britain running through the Dampier Strait. The land borders are somewhat arbitrary dividing lines, drawn by previous colonial administrations, and do not correspond to natural geographical or cultural boundaries. The Umboi and Siassi Islands were formerly part of West New Britain, but are now part of Morobe in spite of separation from the mainland by the Vitiaz Strait and close cultural ties with West New Britain.



MAP 1: PAPUA NEW GUINEA SHOWING THE MOROBE PROVINCE



MAP 2: DISTRICTS OF MOROBE PROVINCE AND THEIR POPULATION

Communications within the province have improved enormously in the last 30 years, but still present a certain amount of difficulty. All-weather roads run from Lae up the Markham Valley and to Mumeng, Bulolo, Wau and Upper Watut. In addition, there is seasonal access by road to Aseki and Menyamya from Bulolo; to Boana on the southern slopes of the Huon Peninsula; to Wagau from Mumeng along the Snake River Valley; and to a number of villages close to main roads. Otherwise access to villages is by air, water or bush walking track. There are a large number of small airstrips serviced by third level airlines, although many of these are closed periodically due to adverse weather conditions. Coastal villages usually have their own boat or access to commercial shipping services, while canoe transport is used in the lower reaches of the major rivers. Most villages are within three days walk of a road, an airstrip or a coastal port.

Although there were sporadic visits by earlier explorers and traders, European influence in the area really began in the 1880s. North-East New Guinea and neighbouring islands were declared a German Protectorate in 1884, but it was a trading company, the Deutsch-Neu-Guinea Kompanie, which assumed responsibility for its administration from Finschhafen the following year. A short time later, the Neuendettelsau Lutheran Mission established stations at Simbang and Sattelberg, which are also in the Finschhafen area. Responsibility for the territory's administration returned to the German government in 1899. The name 'Morobe' comes from the Morobe Patrol Post some 130km south-east of Lae. This border post was established by the German administration early in the 20th century as the nearest harbour to the Australian territory, and it later became the headquarters of the district. During the First World War, in 1914, the post was taken over by Australia. On patrols from Morobe in the 1920s, the rich goldfields of the Wau and Bulolo areas were discovered, and the district headquarters were moved to Salamaua, which was the nearest port to the goldfields. Salamaua, however, was not suitable for the establishment of a large aerodrome, and one was built instead near the mouth of the Markham River at Lae. There followed considerable debate about the suitability of the respective sites to be the major centre (Robson 1932), but eventually the administration headquarters were moved to their present location at Lae after World War II.

Today Lae is the largest industrial centre in Papua New Guinea, and its population of over 60,000 constitutes about 20% of the total population of the province. The city's population includes a considerable number of expatriates (7%) and a fairly large though indeterminate proportion of Papua New Guineans from other provinces. Migration from the Highlands provinces in particular has been facilitated in recent years by improvements in the Highlands Highway road network. In addition, many Morobeans from all districts leave their villages for varying lengths of time to come to Lae to find employment or to visit relatives.

The city of Lae is the major source of employment in the area, and is also a centre where health and education facilities are sought. Mission activity is strong in the province, and the greatest percentage of the population belong to the Lutheran Church, whose national headquarters are at Ampo, in Lae. Other churches also have supporters, especially the Catholics, Anglicans, United Church and Seventh Day Adventists, as well as a variety of smaller missions. Following the country's independence in 1975, moves were made towards decentralisation, and the Morobe Province attained limited political autonomy in 1980 with the establishment of an elected provincial government.

2.1.2 ETHNOGRAPHIC STUDIES

The indigenous cultures of the province show a good deal of diversity, from the maritime traders of Siassi to the mountain dwellers of the Menyamya area. It is doubtful whether a distinctive

'Morobe Culture' exists, as provincial boundaries cut through related cultural groups, but there may be certain art styles or social features which will in the future come to be associated with the name 'Morobe'. The earliest ethnographic accounts are probably those of Finsch (1882, 1887) who described the people and houses of the Finschhafen area. Other descriptions of this area were provided by Schellong (1889, 1891), while Bonaparte (1888) commented on the impressive sailing canoes built by the Tami people. The first detailed ethnographic account was Neuhauss's three-volume work *Deutsch-Neu-Guinea* (1911), which gives much useful information about aspects of Morobe cultures in the early stages of European contact, as well as data from further west along the north New Guinea coast. Chapters in this work by Zahn on the Yabim, Keysser on the inland (kai) people, Lehner on the Bukaua, Bamler on the Tami and Stolz on the Sialum give valuable insights into traditional life in these societies. Keysser (1912) added further observations on the life of the inland people of the Huon Peninsula, while Andexer (1914) described life in the Watut area.

In later pre-World War II studies, Groves (1934) gave an account of the inhabitants of Sio Island off the north coast of the Huon Peninsula, while the Upper Watut area was investigated by Blackwood (1939, 1940, 1978). The government officer Vial described mortuary practices among the Buang (1936), the ceremonial life of the Wantoat (1937) and various aspects of demography (1938) and general features (1943) of Huon Peninsula life. Lehner (1935) wrote a description of male initiation into the *balum* cult, based on his studies of the Bukaua.

During the Second World War, Lae and most of the Morobe Province were occupied by Japanese forces, although an important Allied base was maintained at Wau. Heavy fighting took place before Australian control was re-established, and the war had a profound effect on the indigenous population, who had no choice but to be involved in the conflict. Their help was successively recruited by both sides, and in addition to casualties resulting from this, many were traumatised by the sheer scale of the military activity. Various Allied 'coast watchers' remained behind enemy lines during the occupation, and interesting accounts of this period may be found in Freund (1946), Ryan (1959) and Robinson (1972).

Since the war, a number of detailed anthropological studies have been carried out in the province. Hogbin (1946, 1946-1947, 1947d, 1947a, 1947b, 1947c) described a variety of aspects of the life of the people of the Huon Gulf, especially at Busama village. Much of his work is summarised in *Transformation Scene* (Hogbin 1951). Hogbin first investigated the area during the war, and change is naturally a focus of his attention. However, in spite of an acceleration in the rate of change brought about by the war, Hogbin notes that some of the agents of change had already been present for some time (1951:1):

Europeans entered the area before 1900, and for two generations the old way of life was being steadily modified. Government officers stamped out raiding and introduced a different set of laws; missionaries preached the Christian religion and established a church and a school; labour recruiters took the young men away to work in distant places; and traders operated stores in neighbouring towns where cash earned as wages could be exchanged for tools more effective than those made of stone and volcanic glass.

The anthropologist Hans Fischer made a study of the Lower Watut area (1963) and of the Yagwoia people of the central ranges (1968). The latter people belong to a group which straddles the borders between Morobe, Eastern Highlands and Gulf Provinces, formerly known as the Kukukuku. However, Lloyd (1973:97) notes that the term is considered offensive by many people from the area and suggests that the term 'Angan' be substituted. There are several popular accounts of early contact

with this group of people, for example Simpson (1965) and Sinclair (1966), often focusing on their legendary aggressive tendencies. Read (1950) described the political system of the Ngarawapum of the Upper Markham Valley, while Schmitz (1955, 1958, 1960a, 1960b) made a number of studies of Huon Peninsula cultures, and wrote a detailed account of the art styles and religious practices of the Wantoat people (1963). The Buang of the Mumeng area have been investigated by Girard (1968-1969) and also by Hooley (1970), whose work was mainly linguistic, but contains much information of general anthropological interest. Art styles of the Tami have been described by Bodrogi (1955, 1956, 1961) and Coote (1977) and the musical instruments of the Markham area by K. Holzknacht (1956).

The history of Lae and surrounding villages has been discussed in Hogbin (1951), Robinson (1972), Willis (1972, 1974) and Sack (1976). Traditional trading networks in the province have received considerable attention, and accounts appear in Hogbin (1947b) and Harding (1967, 1970). A detailed account of the social organisation of the Siassi Islanders can be found in Freedman (1967, 1970). It is encouraging to note that some recent social research has been conducted by Morobeans themselves, for example Gipey (1978) and Wamma (1979). Research of a purely linguistic nature will be discussed in the following section.

2.2 LANGUAGES OF MOROBE PROVINCE

2.2.1 RESEARCH INTO MOROBE LANGUAGES

Like many other parts of Papua New Guinea, the Morobe Province is linguistically diverse, with a large number of languages spoken by relatively small populations. Linguistic research in Morobe is only about 100 years old, and there is still an enormous amount of work to be done on the languages, although a reasonably clear picture of their family relationships is gradually emerging. There are just over 100 indigenous languages in the province, two of which were adopted as *lingua francas* by the Lutheran Mission and became well-known in certain areas. Another *lingua franca*, Melanesian Pidgin or Tok Pisin, is probably the most widely spoken language, while English has been adopted as the language of nearly all formal education. Multilingualism is the norm in most communities.

Descriptive work on Morobe languages began in the 1880s and was carried out mainly by early missionaries. Shortly after the Lutheran Mission arrived in the Finschhafen area in 1886, Flierl and Tremel established a station on the coast at Simbang, where the Yabim language was spoken. Schellong of the New Guinea Company produced a list of kinship terms for this language (1889) followed by a rather inaccurate dictionary (1890). Later, the missionaries Vetter and Zahn, and Dr Dempwolff of the University of Hamburg also worked on the Yabim language, while the journalist Zoller (1890, 1891) produced word lists from a large number of languages in the area. Other word lists were produced by Schmidt (1900-1902). In 1892 the mission moved inland to Sattelberg, and the language of this area, now known as Kâte, was investigated by the missionaries Flierl, Keysser and Pilhofer, assisted by Dempwolff (Renck 1977a). Later work was carried out by Neuhaus (1911) and Keysser (1911), who worked on a number of languages spoken by a group then known as the *kai* people. The term *kai*, meaning 'forest' in the Tami language, was used loosely by Neuhaus to distinguish inland people from those on the coast, but in Keysser's case it was used to refer to Kâte speakers (McElhanon 1970b:1183). Schmidt (1926) reviewed work around the Finschhafen area, and Pilhofer (1927) produced further material on Kâte grammar. The adoption of Yabim and Kâte as *lingua francas* by the mission led to a concentration of effort on these two

languages and a neglect of others for many years. However, a study of the Ono language spoken near Kalasa on the east coast of the Huon Peninsula was published by Wacke (1930-1931).

A major survey of the languages of the South-west Pacific by Capell (1954) added several more languages to the Morobe list, and Schmitz (1955) produced some further information in his survey of the Huon Peninsula area. A classification of non-Austronesian languages was attempted by Loukotka (1957) based on a somewhat cursory investigation of the available materials (McElhanon 1970b:1190). Salzner (1960) produced a language map of the Huon Peninsula area and classified the languages into seven groups, three non-Austronesian and four Austronesian, although there were many inaccuracies. Schmitz's 'Historische Probleme in Nordost-Neuguinea, Huon Halbinsel' (1960a) contains a linguistic survey of the area from Madang to Umboi including the Huon Peninsula, Finisterre Range and Markham Valley, but this also has many inaccuracies. Capell's revised survey (1962) added more languages, but also contains much unreliable information, including that drawn directly from Schmitz (1955). In 1963, Fischer published some work on the Lower Watut languages, while Sankoff (1968) compared languages of the Buang area with other Austronesian languages of the province in her study of multilingualism. A long-term study of the Adzera language of the Upper Markham Valley by K. Holzknacht remained in manuscript form for many years, but some publications later appeared (1973a, 1973b, 1973c).

In the late 1960s, the first serious attempt to produce a comprehensive and accurate language survey of the whole province using reliable data was made by Hooley and McElhanon and other linguists from the Summer Institute of Linguistics. McElhanon's 'Preliminary observations on Huon Peninsula languages' (1967) reviewed current knowledge of languages north of the Markham, and in 1970 Hooley and McElhanon's 'Languages of the Morobe District, New Guinea' appeared. For the first time a reasonably reliable classification of all the languages of the province was available, and a list of languages taken from the works of Capell, Schmitz and Salzner was compared with language names presented in this new classification.

In Hooley and McElhanon's 1970 classification, the position of the non-Austronesian languages of the Huon Peninsula was considerably clarified. Available data indicated the existence of two micro-phyla in this region, the Huon and Finisterre Micro-phyla. The former contained 22 languages grouped into five families and one stock-level isolate, and generally described the languages in the eastern half of the Huon Peninsula and Umboi Island. The Finisterre group of the western Huon Peninsula area included some languages spoken in the Madang Province, and consisted of 35 languages grouped into five families. Other non-Austronesian languages in other parts of the province are members of groups spoken mainly in other provinces: the Binandere Stock located mainly in Northern Province; the Kunimaipa Family, mainly in Central Province; the East New Guinea Highlands Stock, mainly in the Eastern Highlands Province and the Anga Stock, found also in the Gulf and Eastern Highlands Provinces, but well represented in Morobe also. The 38 Austronesian languages of the province were classified into four families, the Azera, Buang, Jabem and Siassi Families, with a remainder of three unclassified languages. The members of the Buang Family were termed 'groups', as their status as languages or dialects had not been confirmed.

The position of the Austronesian languages was further clarified in Hooley's 'Austronesian languages of the Morobe District, Papua New Guinea' (1971). More comprehensive cognate percentages were now available, but Hooley notes the difficulty of deciding the cut-off point for determining where a dialect ends and a language begins. He concludes (1971:91):

The best solution ... is to examine the data themselves to see if there are natural plausible groupings somewhere around those suggested by Swadesh. That is we are applying a functional rather than a formal criterion.

For the 1971 material, 77% of apparent cognates on the basic vocabulary list is used as the cut-off point for dialects, and 28% for languages of a family. Hooley's 1971 conclusions are basically similar to Hooley and McElhanon's 1970 classification except that the 'Jabem' and 'Siassi' Families are now combined as the 'Siasi' Family. A fourth family consisting of the Hote and Yamap languages is suggested as a link between the Buang and Siasi Families. The Buang Family is reduced from nine 'groups' to six languages.

Hooley's classification is clearly at variance with that of Capell's 1969 survey, where Austronesian languages of the area are divided into AN1 and AN2 groups according to certain grammatical features. According to Capell, AN1 languages typically have the word order subject-verb-object, whereas AN2 languages are typically subject-object-verb. Other typical AN2 features are the placing of the demonstrative after the noun in noun phrases and the absence or unimportance of dual and trial forms. Hooley attacks Capell's position in 'Austronesian languages of the Morobe Province' (1976), a further refinement of the position of the group. In noting that there are a number of discrepancies in Capell's classification, he states (1976:337):

Since these discrepancies do relate to his principal identifying criterion, his whole theory is called into serious question. At least for the Morobe Province, the classification of the AN languages into AN1 and AN2 groups is inconsistent and not particularly helpful. At the present state of our knowledge, therefore, a classification based on lexicostatistical studies would seem to be more enlightening.

Hooley's 1976 classification is basically similar to that of 1971 except that two previously unclassified languages, Yalu and Lae, are added to the Adzera Family. This family is now subdivided into the Lower Watut, Markham and Musom Sub-families. The Buang Family is further modified, the six languages of 1971 now being reduced to five. More recent work on Morobe Austronesian languages has been carried out by Lincoln (1976), Bradshaw (1977, 1978a, 1978b), S. Holzknacht (forthcoming), Siegel (1984) and Siegel and Kamake (n.d.), while their position within the Austronesian group has been discussed by Grace (1961, 1968), Dyen (1965), Milke (1965), Chowning (1970, 1973), Capell (1976a) and Pawley (1978). Teams from the Summer Institute of Linguistics have been collecting data in the Mumeng, Buang, Hote and Iwal (Kaiwa) areas.

The non-Austronesian languages of Morobe are all included in what is now known as the Trans-New Guinea Phylum (Wurm 1975:299). The position of those north of the Markham was further refined in McElhanon's 'The north-eastern areas of the Trans-New Guinea Phylum' (1975). Here McElhanon combines what were previously classified as the Huon and Finisterre Micro-phyla into a single stock, the Finisterre-Huon Stock. This stock consisted of nine families plus Kovai, which remained as a family-level isolate. Four of these families are located wholly or mainly in the Madang and Eastern Highlands Provinces. Family relationships and grammatical details of non-Austronesian languages south of the Markham have also received attention. The Binanderean Family was investigated by Wilson (1969), the Angan Family by Lloyd (1973) and the Goilalan or Kunimaipen Family by Dutton (1975). The Waffa language is the single Morobe representative of the Eastern Family of the East New Guinea Highlands Stock described by McKaughan (1973). Finally the Wasembo language of the Markham headwaters was considered to be a phylum-level isolate, but McElhanon (1975:902) gives evidence to suggest its inclusion in the Madang and Adelbert Range

Sub-phylum of the Trans-New Guinea Phylum. Summer Institute of Linguistics field workers are continuing investigations into 17 of the non-Austronesian languages of the province.

2.2.2 THE LATEST CLASSIFICATION

The language classification adopted for the purposes of this study is the latest and most comprehensive yet produced (McElhanon 1984). In this classification, the position of the Austronesian languages takes into account recent studies of Chowning (1970) and Z'graggen (1976), and the Siasi Family languages of Morobe now appear in both the Vitiazan and Bariai Sub-families. McElhanon acknowledges that the classification is as yet tentative, and it will no doubt be modified as more linguistic evidence comes to light.

Two additions have been made to McElhanon's list here. Firstly the Susuami language of the Upper Watut Valley is provisionally included with the Angan Family. This language is only spoken by a few dozen people, and was apparently not recorded until investigated by the writer in the course of field work in the area (Smith forthcoming). Secondly, although McElhanon tentatively includes the village of Koripon in the Isan language area, its status is not certain in the absence of adequate information. Counting data obtained at Koripon were quite unlike those of other villages in the same language area, and thus it is here given a separate status.

A full classification appears below. Population figures, based on censuses carried out between 1969 and 1976, are also given for each group. Where a language or family is also spoken in other provinces, the figures refer only to the Morobe population.

PART ONE - AUSTRONESIAN LANGUAGES (75,015)

A. SIASI FAMILY	(29,351)	BARIAI SUB-FAMILY	(2,632)
VITIAZAN SUB-FAMILY	(26,719)	16. Gitua	(483)
HUON GULF GROUP	(17,243)	17. Mutu	(2,149)
1. Bukauac	(9,694)	B. ADZERA FAMILY	(22,506)
2. Kaiwa	(923)	LOWER WATUT	
3. Kela	(2,750)	SUB-FAMILY	(1,407)
4. Labu	(1,522)	18. Dangal	(365)
5. Lae	(<10)	19. Maralango	(171)
6. Numbami	(270)	20. Silisili	(871)
7. Yabim	(2,084)	MARKHAM SUB-FAMILY	(16,927)
ISLAND GROUP	(9,655)	21. Adzera	(15,382)
8. Barim	(469)	22. Ngariawan	(367)
9. Lokep	(639)	23. Sirasira	(601)
10. Malasanga	(435)	24. Sukurum	(577)
11. Mangap	(2,294)	25. Unank	(no figures)
12. Nenaya	(315)	26. Wampar	(5,085)
13. Roinji	(114)	27. Wampur	(274)
14. Sio	(1,774)		
15. Tami	(904)		

BUSU SUB-FAMILY	(1,281)	34. Mapos	(6,666)
28. Duwet	(363)	35. Mumeng	(9,186)
29. Musom	(231)	36. Piu	(130)
30. Sirak	(145)	37. Vehes	(100)
31. Yalu	(542)		
C. BUANG FAMILY	(18,094)	D. HOTE FAMILY	(3,064)
32. Kapin	(1,841)	38. Hote	(1,310)
33. Manga	(2,688)	39. Misim	(251)
		40. Yamap	(1,310)

PART TWO - NON-AUSTRONESIAN LANGUAGES (174,468)

E. ISOLATE		71. Numanggang	(2,274)
41. Kovai	(3,216)	72. Sauk	(605)
F. EASTERN HUON FAMILY	(24,836)	73. Urii	(2,470)
42. Dedua	(4,743)	I. WANTOAT FAMILY	(9,815)
43. Kâte	(6,125)	74. Bam	(393)
44. Kosorong	(1,563)	75. Irumu	(1,614)
45. Kube	(5,864)	76. Wantoat	(7,316)
46. Mape	(5,117)	77. Yagawak	(492)
47. Migabac	(1,050)	J. GUSAP-MOT FAMILY	(550)
48. Momare	(374)	78. Ufim	(550)
49. Sene	(>10)	K. YUPNA FAMILY	(216)
G. WESTERN HUON FAMILY	(56,943)	79. Bonkiman	(54)
50. Burum	(4,086)	80. Isan	(100)
51. Kinalakna	(219)	80a. Koripon	(62)
52. Komba	(12,235)	L. URUWA FAMILY	(2,547)
53. Kumukio	(552)	81. Komutu	(510)
54. Mesem	(1,750)	82. Sakam	(510)
55. Nabak	(9,505)	83. Som	(88)
56. Nomu	(807)	84. Weliki	(127+)
57. Ono	(4,550)	85. Yau	(1,312)
58. Selepet	(6,353)	M. PIHOM STOCK	(464)
59. Sialum	(641)	86. Wasembo	(464)
60. Timbe	(11,279)	N. EASTERN FAMILY, EAST N.G.	
61. Tobo	(2,888)	HIGHLANDS STOCK	(1,000)
62. Yaknge	(2,078)	87. Waffa	(1,000)
H. ERAP FAMILY	(12,793)	O. ANGAN FAMILY	(42,077)
63. Finungwa	(469)	88. Agaataha	(1,003)
64. Gusan	(869)	89. Hamtai	(19,900)
65. Mamaa	(194)	90. Kamasa	(20+)
66. Munkip	(137)	91. Kawatsa	(30)
67. Nakama	(1,036)	92. Menya	(12,056)
68. Nek	(1,461)	93. Safeyoka	(3,120)
69. Nimi	(1,558)		
70. Nuk	(1,720)		

94.	Yagwoia	(6,098)	Q. BINANDEREAN FAMILY	(13,292)	
94a.	Susuami	(50?)	98.	Binandere	(312)
P. KUNIMAIPAN FAMILY		(6,719)	99.	Guhu-Samane	(6,289)
95.	Biangai	(1,261)	100.	Mawae	(943)
96.	Kunimaipa	(1,349)	101.	Suena	(2,272)
97.	Weri	(4,109)	102.	Yekora	(674)
			103.	Zia	(2,802)

2.3 OTHER LINGUISTIC CONSIDERATIONS

The listing above gives population figures for each language, but ignores the fact that most people speak more than one language, usually including at least one of the three lingua francas (Sankoff 1971, 1977). An in-depth sociolinguistic study of multilingualism in the Buang community by Sankoff (1968) indicates some of the functions of different languages in different contexts. The two mission lingua francas, Kâte and Yabim, are still spoken in a variety of language groups. Kâte was used by early missionaries mainly in inland areas of the Huon Peninsula, and further afield where non-Austronesian languages were spoken. Yabim was used mainly along the coast and in the Markham and Mumeng areas, but not all of the groups adopting it spoke Austronesian languages (Renck 1977a, 1977b, McElhanon 1979). In the early stages, both were successful, partly due to the unifying effect they had on congregations from linguistically different and traditionally hostile areas. Mission schools taught literacy in Kâte or Yabim, and most of the reading material which became available to the indigenous population was in these languages. Hence the languages came to have a certain amount of prestige. Later, as more vernacular translations appeared, and the Australian administration withdrew funding from all except English-medium schools, the languages declined in importance. However, funding may not have been the only reason for the decline. As McElhanon (1979:283) notes:

Far more important was the fact that nationals recognised that education in Kâte represented a 'dead-end road', and that at the end there was no economic advantage.

Today, Kâte seems to be more widely used and viable as a lingua franca than Yabim, whose use is largely confined to mission contexts, and there is a decline in the popularity of mission education in general.

Tok Pisin, on the other hand, appears to be gaining in influence, and is widely used at informal gatherings and in government and business contexts. Several varieties of Tok Pisin have been distinguished by Mühlhäusler (1975), and it seems that some of the prestige associated with speaking English can still be gained by using a variety of Tok Pisin which includes a sprinkling of phrases taken directly from English. These may or may not be comprehensible to the listener. English is the official language of education, and is a pre-requisite for the more attractive employment opportunities. It is widely used in many urban institutions, especially those where expatriates are employed. However, it seems that Tok Pisin is being increasingly used in schools, especially in lower primary grades, to provide supplementary instruction. Although German was the official administration language for approximately 30 years, the only vestiges apparent today are German words which have entered Tok Pisin, such as *beten* 'prayer', *rausim* 'expel', from the German *heraus*, and *popaia* 'miss', from the German *vorbei*.

In a multilingual situation, the future of small language groups would appear to be precarious (Laycock 1979:94). However, languages may persist because of their role in maintaining the identity

of a group. Grace (1975) points out some other factors leading to diversity rather than homogeneity, and Bradshaw (1978a:31) and Wamma (1979:79) discuss the use of vernaculars in excluding others from conversations. In spite of these considerations, it appears that the Lae language may already be extinct, while the Sene language has been so influenced by Kâte that its independent existence is threatened. A similar situation may obtain in the case of the Weliki language, which has been greatly influenced by Selepet and Timbe (McElhanon personal communication). The future of Kamasa, Kawacha and Susuami, all spoken in heterogeneous language communities and conforming to what Laycock (1979) describes as a 'swamp situation', likewise seems uncertain. Other languages with very few speakers such as Som may have a better chance of survival, as they are apparently spoken by all members of the single village community (Laycock's 'wash situation').

3. FIELDWORK PROCEDURES

3.0 INTRODUCTION

As was seen in the last section, a considerable amount of work has been done on Morobe languages, and word lists compiled by other researchers were used as one source of data on counting systems. Other data assembled as part of this project were collected from informants in various parts of the province. This section gives some details of how and from whom data were elicited and recorded.

3.1 INFORMANTS

The population of Morobe lives in villages and hamlets scattered throughout the province as well as in the small centres of population at district and mission headquarters and the large population centre at Lae. As noted in section 2, access to many of the rural areas presents considerable difficulty. However, an attempt was made to contact informants in the home language area wherever possible, as well as the more easily contacted city dwellers.

The most accessible informants are those living in Lae. The population of Lae is large and varied, comprising representatives of most if not all of the language groups of Morobe, as well as people from other provinces of Papua New Guinea and from other countries. The simplest method of obtaining information might appear to be to search out people from the various Morobe language groups living in Lae. However, such informants were often found to be unsuitable or unreliable. Many had been away from their rural villages for a long time, while still describing themselves as being from that place. In many cases the mother tongue was spoken little or not at all during this period away from the place of origin. The use of Tok Pisin in Lae is widespread. It is common even among speakers of the same language, and the vernacular may be reserved for use when outsiders are to be specifically excluded from conversations (Bradshaw 1978:31). In the urban situation, counting in particular tends not to be of the traditional kind, as people need to be familiar with and make use of Tok Pisin and English numbers to cope with the everyday world of wages, prices and fares. Thus, even if urban-based informants retain some knowledge of the traditional systems, it may be difficult for them to recall immediately and out of context when asked by an investigator. The search for information from city residents proved to be somewhat unproductive, and other sources were sought.

Students in high schools were considered as a source of information as they are from a number of different areas, are temporarily concentrated in one place and are thus easily available. Also, they do some work on traditional counting systems in Grade 7 of the mathematics syllabus and might be

expected to provide some useful data. In fact, high school students were found to be interested and willing informants, but the reliability of some of their information is open to question. Many students in Lae's high schools have been effectively excluded from much of their traditional culture since the beginning of their school days, usually at the age of seven or eight, and may have forgotten, or never have known, much about traditional counting methods. Boarding students are housed in dormitories where a variety of language areas are represented, and the normal medium of communication is English or Tok Pisin. Alternatively, day students live in the kind of urban situation referred to above. It was also difficult to dispel the idea among many students that the investigator wanted 'correct' answers only, and there was a tendency to copy systems from one another in an effort to produce the desired result. Some students simply stated that they did not know traditional counting words or methods and would have to ask older village people on their return home during school holidays. These limitations notwithstanding, some useful information was obtained from high school students at the Bugandi, Bumayong and Busu Provincial High Schools in Lae, and others outside Lae at Dregerhafen, Kaiapit and Siassi Provincial High Schools. This information was used as a check and for clarification of the meaning of some terms rather than a primary source of data.

3.2 COLLECTION OF DATA IN VILLAGES

The best informants were found to be those normally resident in the villages where a particular language is spoken. Hence a considerable effort was made to reach these villages, involving patrols by air, sea, road and foot into all districts of the province. In the villages, informants usually presented themselves willingly, and a small gift or payment was given. Some questions about language use in the area were asked, both to establish rapport and because multilingual situations are common in the province, and it was necessary to be sure exactly which language was being discussed. Occasionally information provided by villagers about language relationships in the area was quite different from linguists' published classifications, although, as Hooley notes (1971:85), this should be treated with caution in the absence of follow-up studies. Information about counting and numbers was then sought. If difficulties arose, prospective informants would usually call together some senior men who would provide the definitive information on the subject. Wherever possible, data were recorded in a group situation, where slips could immediately be corrected and clarification obtained. Although some excellent information was obtained from single informants, there was occasionally the suspicion that responses were given without sufficient attention to accuracy for the sole purposes of obtaining payment for the service. Extra information from different informants speaking the same language was obtained where possible, and there were often small discrepancies between accounts from different villages or dialects. On a number of occasions I was assisted by someone who was able to explain the purpose of my visit in a lingua franca such as Kâte or in the local vernacular, and this was helpful in avoiding misunderstanding. However, in such cases there was also a tendency for the translator to suggest answers to informants and thus reduce the reliability of the data. Elicitation was normally carried out in Tok Pisin, but occasionally through an interpreter. On several occasions a Tok Pisin-speaking informant would begin and later refer to an older man for clarification. This usually involved discussion in the vernacular followed by a translation for the investigator in Tok Pisin. The majority of informants were male, although checks with female informants did not reveal any perceptible differences. The basic information elicited consisted of all the numeral words the informant could give, plus methods of counting or tallying. On brief visits it was difficult to obtain much in-depth information about the use of counting in a culture, but where any extra information was forthcoming, this was recorded.

3.3 RECORDING INFORMANTS' RESPONSES.

Information in a wide variety of languages was given by informants in verbal form, and this was transcribed by the investigator. This presented something of a problem, as not all languages in the province have been investigated or alphabets devised for them. Thus a broad phonetic transcription was adopted for the purpose of recording most vernacular responses. A more narrow phonetic transcription was not attempted as it was not considered essential for the purposes of this study. Checks were later made with available published material. There are a number of languages where the phonology has been investigated and orthographies and grammars devised. In such cases, use was made of the alphabets available. Checks were also made against survey word lists, which usually include some number terms, and help was elicited from linguists working on Morobe languages during the period of this study. In particular, linguists from the Summer Institute of Linguistics provided a great deal of assistance by obtaining or checking data and providing insights from their knowledge of the language and culture of their study area. Some question sheets were sent out to Siassi and Dregerhafen Provincial High Schools, and the students wrote responses on their own. In some cases, Kâte, Yabim or other established orthographies were evidently adopted. In other cases idiosyncratic spelling was used, and this was checked with other informants.

Translation of vernacular terms presented some difficulty. A direct translation could usually be made of lower numerals, although the number 'one' in particular could sometimes take a variety of forms. Where higher numbers were represented by more complex circumlocution, it was sometimes difficult to obtain a literal translation of individual terms rather than a general translation of the whole term. For example, on one occasion informants from the Mapos language translated the expression *miran dadu sti* as 'twenty'. It appeared that there was more to this term than a simple numeral equivalent, but repeated attempts to elicit a more specific meaning of the morphemes failed. In cases such as this, information from linguists working on Morobe languages and published grammars and word lists were used for clarification where possible.

4. COUNTING METHODS USED IN MOROBE PROVINCE

4.0 INTRODUCTION

Data have been obtained from field investigation or secondary sources for all 105 Morobe languages except the Lae language, which now appears to be extinct. These data are assembled in Appendix A, together with comments on each language and counting system. In this section, the data are examined to see the variety of counting methods employed. In particular, the extent of the series of distinct lexical items representing numbers is investigated for each language. As noted in section 2, several classifications of counting systems in Papua New Guinea have already been devised, and reference is made to these in the present analysis of data. Finally, some other types of counting in Morobe are described.

4.1 CLASSIFICATION OF COUNTING SYSTEMS IN MOROBE LANGUAGES

A number of different types of counting procedure can be extracted from the data, and these types are summarised below.

Type A	Use of the body as a tally	(4.1.1)
Type B	Two numerals only	(4.1.2)

Type C	Two numerals plus hands and feet	(4.1.3)
Type D	Three numerals only	(4.1.4)
Type E	Three numerals plus hands and feet	(4.1.5)
Type F	Four numerals plus hands and feet	(4.1.6)
Type G	Numeral for ten	(4.1.7)
Type H	Numerals for ten and twenty	(4.1.8)

4.1.1 TYPE A - THE USE OF THE BODY AS A TALLY

Although many Morobe languages have only a few numeral words and rely on the fingers and toes to tally higher numbers, there were no examples found of extensive body counting series similar to those described for some Central Highlands areas (Franklin and Franklin 1962, Saxe 1981, Biersack 1982) or inland Madang (Aufenanger 1938). Nor could any examples of body counting in Morobe be found in the literature. The nearest reported body system in a coastal area is that reported by Ray (1907:364) from the Musa area of the Northern (Oro) Province to the south-east of Morobe. The only example in the present Morobe data of the use of body parts other than hands and feet for tallying was the inclusion of the two nostrils by informants from the Sakam language in the Uruwa Family, spoken in the Western Saruwageds. After tallying to ten on the hands, the thumbs were successively placed on the two nostrils before tallying continued on the toes to a total of 22. Since only this isolated example was encountered, it can be safely stated that tallying on parts of the body other than the hands and feet plays a negligible role in the counting methods of Morobe.

4.1.2 TYPE B - TWO NUMERALS ONLY

In this type of system there are only two numeral words and the hands and feet do not appear to be used in tallying. An example is the Austronesian Adzera language of the Markham Valley, in which counting proceeds as follows:

1	<i>bits</i>	one
2	<i>iruc</i>	two
3	<i>iruc da bits</i>	two and one
4	<i>iruc da iruc</i>	two and two
5	<i>iruc da iruc da bits</i>	two and two and one
6	<i>iruc da iruc da iruc</i>	two and two and two
	etc.	

This procedure can continue in the same way as long as necessary, but it is clearly too cumbersome to be useful for anything but small numbers. However, other means of indicating number are available to Adzera speakers, such as the use of named terms for groups of a specific number of objects. The term *nam wan*, for example, refers to 'a group of three bunches of bananas to be presented on certain ceremonial occasions' (S. Holzknicht personal communication).

Other Morobe languages for which a system of this type was described by informants are Ngariawan, Sirasira, and Sukurum, all of the Markham sub-family of the Adzera Family, and Bam and Yagawak of the Wantoat Family. The former family is Austronesian and the latter non-Austronesian, but all are spoken in a continuous area in the Upper Markham-Wantoat region.

4.1.3 TYPE C - TWO NUMERALS PLUS HANDS AND FEET

Like type B, this type of system has numeral words only for one and two. The term for three is a combination of the words for one and two, while the term for four is two and two, or two two. However, higher numbers can be indicated by tallying on the hands and feet. An example is the Menya language, which proceeds as follows:

1	<i>hankwona</i>	one
2	<i>hankwakwu</i>	two
3	<i>hankwakwu hankwe</i>	two one
4	<i>hankwakwi hankwakwi</i>	two two
5	<i>hipa hankwona</i>	hand one
10	<i>hipa ekwana</i>	hand all
20	<i>hipa suka ekwana</i>	hand leg all

A clear advantage of this system over the previous one is the ease with which a tally total of 20 can be reached. This total can then be used as a base for higher numbers. Informants in some languages classified as this type only tallied as far as ten on the hands, or repeated four sets of five 'hands' to reach a total of 20. These cases are included with this type as being basically similar in pattern.

Systems belonging to type C are found in the following languages: Roinji and Nengaya (some informants) of the Siassi Family; Dangal, Maralango, Silisili, Wampar, Guwot, Musom, Sirac and Yalu (Adzera Family); Kâte and Mape (Eastern Huon Family); Nomu (Western Huon Family); Finungwa, Gusan, Mamaa, Munkip, Nek, Nimi, Nuk, Numanggang and Sauk (Erap Family); Irumu and Wantoat (Wantoat Family); Waffa (Eastern Family, East New Guinea Highlands Stock); Hamtai, Kamasa, Kawacha, Menya, Safeyoka, Yagwoia and Susuami (Angan Family); Biangai, Kunimaipa and Weri (Kunimaipan Family); and Suena, Yekora and Zia (Binanderean Family).

There is some pattern to the geographical distribution of this group of languages. Those in the South-Central Huon Peninsula area (Erap, Wantoat and Adzera Families) and Central Ranges (Angan and Kunimaipan Families) tend to be of this type, although there are exceptions. Other languages of type C appear occasionally throughout the province. Altogether just over one third of all Morobe languages are of this type.

4.1.4 TYPE D - THREE NUMERALS ONLY

The Som language of the Uruwa Family has three numeral words, but informants did not describe any tallying. Hence the system proceeds by addition, rather like type B:

1	<i>koweran</i>	one
2	<i>yarə</i>	two
3	<i>kabmə</i>	three
4	<i>oyarə oyarə</i>	two two
5	<i>oyarə oyarə kowe</i>	two two one
6	<i>okabmə okabmə</i>	three three
7	<i>okabmə okabmə kowe</i>	three three one
	etc.	

This was the only example of this type found in the Morobe Province. Like type B, this system is useful only for relatively small numbers.

4.1.5 TYPE E - THREE NUMERALS PLUS HANDS AND FEET

This type of system employs three numeral words and tallying on the hands and usually the feet also. An example is the Guhu-Samane language of the Binanderean Family, which proceeds as follows:

1	<i>tena</i>	one
2	<i>eseri</i>	two
3	<i>tapari</i>	three
4	<i>eseri sa eseri</i>	two and two
5	<i>boto tena</i>	hand one
6	<i>boto tena ma tena</i>	hand one and one
10	<i>boto eseri</i>	hands two
15	<i>boto eseri ma oko te</i>	hands two leg one
20	<i>boto eseri ma oko eseri</i>	hands two legs two

Languages using this type of system are Nengaya (some informants) of the Siassi Family; Manga, Mapos, Mumeng and Piu (Buang Family); Migabac (Eastern Huon Family); Kumukio, Nabak, Ono and Sialum (Western Huon Family); Nakama and Urie (Erap Family); Bonkiman, Yupna and Koripon (Yupna Family); Weliki, Komutu and Sakam (Uruwa Family); Wasembo (Pihom Stock); and Binandere, Guhu-Samane and Mawae (Binanderean Family). It can be seen that this system is most commonly found in the languages of the Western Saruwageds and Mumeng area, but examples are found in other families throughout the province. Nengaya is the only example from Austronesian languages other than those of the Buang Family.

It is not always clear whether a term used for three is a distinct numeral or a combination of the terms for one and two. For example, counting in the Sauk language of the Erap Family proceeds thus:

1	<i>ningit</i>
2	<i>yali</i>
3	<i>yalanang</i>

The term for three does not appear literally as 'two and one', although the words are sufficiently similar to suspect a relationship. This relationship might be seen clearly with greater familiarity with the language. Informants translated *yalanang* as 'two and one', and because of this, the term is considered to be derived from the two previous numerals and is included with type C.

In the case of the Nakama language, the derivation is not so clear. Counting proceeds thus:

1	<i>fikanggang</i>
2	<i>lupek</i>
3	<i>lufeten</i>

The term for three looks as though it could possibly be derived from a combination of terms for one and two, but this cannot be demonstrated with certainty, and so the system is included with type E, with three numerals.

4.1.6 TYPE F - FOUR NUMERALS AND HANDS AND FEET

A system of this type has separate numeral words for one to four. However, it is not a 'base-four' system where counting is carried out in groups of four. Instead, tallying proceeds on the fingers and toes to a total of 20, as previously described. An example is the Dedua language of the Eastern Huon Family:

1	<i>mocgu</i>	one
2	<i>jahockang</i>	two
3	<i>harebec</i>	three
4	<i>neakpac</i>	four
5	<i>mara mong</i>	hand one
6	<i>mara mong nga mocgu</i>	hand one and one
10	<i>mara johoc</i>	hand two
15	<i>mara johoc nga hani mong</i>	hand two leg one
20	<i>ngic mong</i>	person one

The range of this type of system within the province is mainly restricted to the Eastern Huon Peninsula and coastal Austronesian-speaking areas, with only a few examples from other areas. The languages of this type are: Kaiwa, Siboma, Yabim, Barim, Gitua and Tami (Siassi Family); Dedua, Kosorong, Kube, Momare and Sene (Eastern Huon Family); Burum, Komba, Mesem, Selepet, Timbe, Tobo and Yaknge (Western Huon Family); Ufim (Gusap-Mot Family); Yau (Uruwa Family); and possibly Agaataha.

In the last-mentioned case, Agaataha (Angan Family), the term for four involves reduplication, but it cannot be demonstrated that this means 'two two', and so it is provisionally regarded as a distinct numeral. Further investigation might indicate a derivation from 'two two', in which case Agaataha would be included in type E.

4.1.7 TYPE G - NUMERAL FOR TEN

In this type of system, there is less dependence on the fingers and toes for indicating number. There are separate numerals for the numbers one to four and also for ten. The word for five may also be a distinct numeral or may be the same as the term meaning hand. For example, in the Bukawac language, counting proceeds as follows:

1	<i>tigen</i>	one
2	<i>lu</i>	two
3	<i>to</i>	three
4	<i>hale</i>	four
5	<i>lim dang</i>	five one
6	<i>lim dang ngando tigen</i>	five one and one
7	<i>lim dang ngando lu</i>	five one and two
10	<i>sahuc</i>	ten
15	<i>sahuc nga lim</i>	ten and five
20	<i>nga sambuc</i>	man complete

This type of system is found in Morobe Province only among the Austronesian languages. They are Bukawac and Kela (Huon Gulf Group, Siassi Family); Lukep, Mangap, Mutu and Sio (Island Group, Siassi Family); Kapin (Buang Family); and Hote, Misim and Yamap (Hote Family). In all

the languages represented in this group, the numbers six to nine are indicated by the terms '5 + 1', '5 + 2', '5 + 3' and '5 + 4' respectively. In some cases, for example Kaiwa, the meaning is literally 'hand and one' and so on, while in others, for example, Bukawac, the term for five is not the same as the usual term for hand, but is still related to the Proto-Oceanic term for 'hand' **lima*. Hence the relationship with finger counting can be seen, but the need for the physical presence of fingers is lessened due to the existence of the base of ten. This type is the first so far examined which can be considered to have a series of abstract numerals as far as ten. The term for twenty, however, is something like 'one man', 'complete person' or 'whole man finished', and refers to a physically present tally total.

4.1.8 TYPE H - NUMERALS FOR TEN AND TWENTY

This type of system shows a greater independence of external tallying aids such as hands, feet or whole persons. There are numerals for ten and twenty, and only the term for five, which is usually the same as or cognate with the term for hand shows the historical connection with tallying. In the Morobe Province, only the Labu and Kovai languages are of this type. The former is an Austronesian language, while the latter is non-Austronesian, but in an area completely surrounded by Austronesian languages. Other languages which may be of this type are adjacent to the Kovai area: Lukep and Mangap of the Island Group of the Siassi Family. However, it is not quite clear whether the terms for twenty in these two languages are distinct numerals or not, and so they have been included with type G.

The Labu language has the following counting terms:

1	<i>tugwatu</i>	one
2	<i>salu</i>	two
3	<i>sidi</i>	three
4	<i>suha</i>	four
5	<i>maipi</i>	five
6	<i>maipi anendi tugwatu</i>	five and one
7	<i>maipi anendi salu</i>	five and two
10	<i>numusu</i>	ten
15	<i>numusu anendi maipi anendi</i>	ten and five and
20	<i>asamuni</i>	twenty

Higher numerals can readily be formed:

30	<i>asamuni numusu</i>	twenty ten
40	<i>asamu salu</i>	twenties two
60	<i>asamu sidi</i>	twenty, three times
	etc.	

Thus a considerable series of abstract numerals can be generated using these terms.

4.2 THE RELATIONSHIP WITH OTHER CLASSIFICATIONS

The types of counting system A to H outlined above were distinguished by inspection of the data collected, and differ from classifications previously described in section 2. Ray's (1907) account of all Papuan (that is non-Austronesian) languages having terms for only two or rarely three numerals

followed by body-counting is clearly wrong, and in fact it was an unjustified conclusion even when based on data available at the time. Following Codrington (1885), Ray described four types of counting system for the Melanesian (that is Austronesian) languages: quinary, imperfect decimal, perfect decimal and vigesimal. The distinction between quinary and vigesimal, although stressed by Ray, does not seem to have been clear-cut or significant, as it was probably the process of elicitation which assigned a system to one or the other type. They are thus grouped together in the present study under types C, E or F depending on the number of numeral words. The presence of a word or base for ten is much more significant, and all those systems described here as type G or H belong to what Ray called the imperfect decimal type. There are no Morobe examples of complete series of ten numerals.

The classifications of Galis (1960) and Wolfers (1972) include types not encountered in Morobe, namely body counting systems and bases of six, eight, fifteen, sixty and possibly four. Similarly, the base-24 system described by Bowers and Lepi (1975) in the Upper Kaugel is not found. Seidenberg's (1960) classification and subsequent conjecture concerning the origin and diffusion of different types of counting systems are based on incomplete and superficial data, and his conclusions may safely be ignored.

Lancy (1977) distinguished four separate types of counting system. All the Morobe examples referred to as types B to H in this study are included in Lancy's types III and IV. His type III includes all systems employing tallying on the hands and feet, and Lancy claims it to be typical of Morobe and other mainland provinces. His type IV or base-ten systems are said to be typical of the New Guinea Islands and East Papuan Island Region. The distribution of base-ten systems in coastal Austronesian-speaking areas of Morobe Province and the implications of this for the culture history of the region will be discussed in section 6.

4.3 OTHER TYPES OF RECKONING IN MOROBE

Lancy's type II is described as using named sets of objects of fixed size, or tallies of objects. These phenomena also occur in Morobe, but in no case is it the sole or dominant type of reckoning. It was quite common for informants from a variety of languages to mention that in former times important objects or events were tallied using bundles of sticks, a series of knots in a rope or a collection of stones. The use of named sets was also recorded from a variety of groups, especially when dealing with coconuts, yams, taro or other garden produce. Sometimes this was used in conjunction with the more usual counting system, for example in the Mutu language, where a standard size for a pile of taro for a feast was reached by counting out named bundles of five according to a base-20 system.

There is some evidence for the existence or former use of a base of four in Morobe. Some languages have an expression for 'four' which has the appearance of a base, but whose meaning is not clear, for example Kube, *kembon pa*, and Tobo *kembem bagap*. The meaning of these terms probably refers to the hand completed apart from the thumb. In Timbe, the word for 'four' is *imbot*, which could be related to the word for 'hand', *bot*. In Burum, an alternative form of 'four' was given as *birikun kwagep*. *biri* means 'hand', hence the possibility that the term for 'four' is a base or a subtractive expression such as 'hand minus one', or 'hand not complete'.

In some languages the term for 'four' refers to the name of one of the fingers or an action of the fingers, for example in Suena, *wana awa patitiro* means 'little finger bent', and in Weru, *kong nent* means 'one fourth finger'. In the latter expression it may be significant that the expression

kong is qualified by 'one', suggesting that it could be a base. Some languages have alternative terms for four, one a distinct numeral and the other formed by addition. For example, in Kosorong, four can be either *nemungac* 'four' or *karong mong* 'three one', while in Nakama the alternatives are *diding* 'four' or *lupeleng lupeleng* 'two two'. However, in all cases where the existence of a base of four is suspected, the dominant type of reckoning is a tally total of 20 on fingers and toes, and evidence for the use of four as a base remains flimsy.

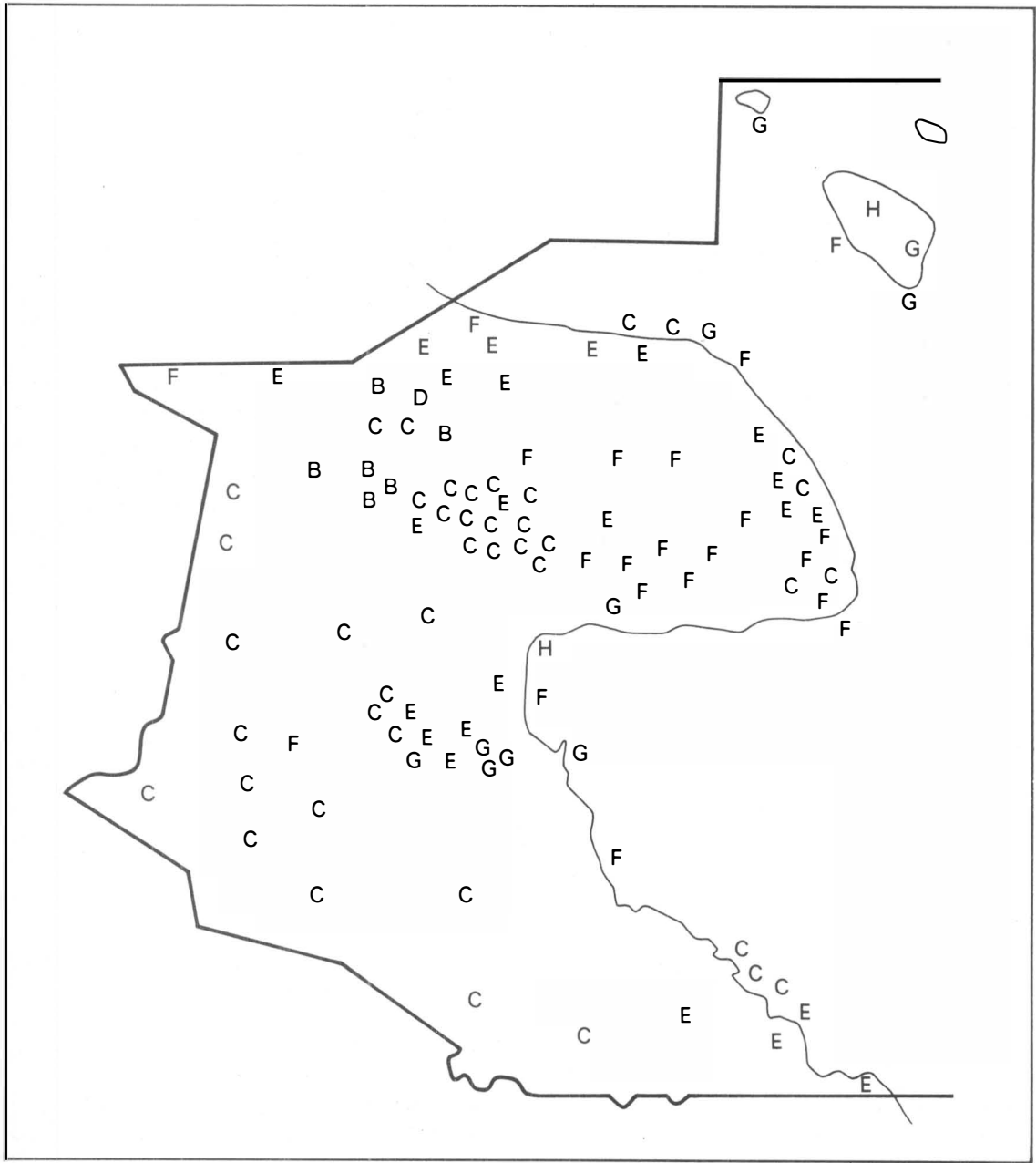
Outside influences over the past century have led to a widespread familiarity with decimal systems introduced by German and Australian educators and administrators. Robinson (1972) even reported that children in Butibum village near Lae could be heard reciting Japanese numerals (also decimal) during the short occupation period. Tok Pisin numerals, derived from English, are now well-known, and have probably replaced traditional systems when dealing with larger numbers for nearly all non-traditional purposes. In the Kosorong language, a system was described which appeared to be a vernacular adaptation of the English decimal system, based partly on Tok Pisin numerals, but this kind of adaptation does not appear to be common. A highly unusual and idiosyncratic system was described in the Urii language by one informant, but was not confirmed by other informants in the area.

The need to use money has necessitated familiarity with a succession of currencies: Deutschmarks and pfennigs (base-ten), pounds, shillings and pence (base-20 and base-12), dollars and cents (base-ten) and kina and toea (base-ten). The pound of 20 shillings was the first currency to be well-known by many Papua New Guineans, and was easily adaptable to finger and toe tallying systems. The change to dollars and cents, and shortly afterwards to kina and toea seems to have caused a certain amount of difficulty. Similarly, there is still confusion between ten-based and 20-based counting, as the following examples indicate. In the Mumeng area, some informants gave 'ten' as the total equivalent to 'one man' rather than the more usual 'twenty', while in Mutu, the number *ndingnding*, equivalent to 20 times 20, is commonly translated as 'one hundred' rather than 'four hundred'. Some Labu informants referred to the higher numerals above 20 *asamusalu* and *asamusidi* as 40 and 60 respectively, whereas others translated them as 30 and 40. This confusion is probably due to the introduced decimal series of numbers interfering with a traditional 20-based conception, and this may have been aggravated by changes in the money system.

5. VARIATIONS IN COUNTING TYPES WITHIN LANGUAGE FAMILIES

5.0 INTRODUCTION

In the previous section, several different types of counting system were distinguished. The purpose of this section is to see what kind of relationship exists between the distribution of the various types of counting system (see Map 3) and the distribution of the different language families in the province (see Map 4). As noted in the Introduction, an observation by Laycock (1977:219) indicates that in many parts of the New Guinea area, little correlation between languages and counting systems can be expected. Here, each language family in turn is examined to see how much variation in type there is between the different languages of the family.



MAP 3: DISTRIBUTION OF COUNTING TYPES IN MOROBE LANGUAGES

5.1 AUSTRONESIAN LANGUAGES

5.1.1 THE SIASSI FAMILY

Types of counting system employed in the languages of the Siassi Family are as follows:

HUON GULF GROUP		ISLAND GROUP	
Bukawac	G	Barim	F
Kaiwa	F	Gitua	F
Kela	G	Lukep	G (H?)
Labu	H	Mangap	G (H?)
Lae	No data	Mutu	G
Siboma	F	Nengaya	C or E
Yabim	F	Roinji	C
		Sio	G
		Tami	F

It is immediately apparent that there is a fairly wide range of types within this family. Included here are simple systems with only two numerals, and the most complex type found in Morobe, with numerals for one to five, ten, twenty and higher combinations. The Huon Gulf Group shows greater internal consistency, with three decimal systems and three with four numerals followed by hand and foot tallying. The Island Group shows a reasonable amount of internal consistency apart from two exceptional cases, Roinji and Nengaya. Of the others, there are four decimal systems, while three have four numerals followed by tallying.

5.1.2 THE ADZERA FAMILY

The following types of counting system occur in the languages of the Adzera Family:

LOWER WATUT SUB-FAMILY		MARKHAM SUB-FAMILY	
Dangal	C	Adzera	B
Maralango	C	Ngariawan	B
Silisili	C	Sirasira	B
		Sukurum	B
		Unank	C
		Wampar	C
		Wampur	C
BUSU SUB-FAMILY			
Guwot	C		
Musom	C		
Sirak	C		
Yalu	C		

There is considerable uniformity here. All languages have two numeral words, and the word for 'two' appears to be cognate for all the languages of the family (see Appendix B). In some Markham Sub-family languages, counting was described without the use of finger tallying. In the remainder of this sub-family and all the languages of the Lower Watut and Busu sub-families, two numerals and tallying on hands and feet were employed.

5.1.3 THE BUANG FAMILY

The following counting types are found in the Buang Family:

Kapin	G	Mumeng	E
Manga	E	Piu	E
Mapos	E	Vehes	E

All the languages except one employ three numerals and hand and foot tallying. Kapin is exceptional, with a decimal system, although possible reasons for this have not been identified.

5.1.4 THE HOTE FAMILY

The following counting types occur:

Hote	G
Misim	G
Yamap	G

All languages in this family have the same type of decimal system. The words used in these three languages are very similar, and this supports the idea that they may be better considered as dialects of a single language, as suggested by Marguerite Muzzey (personal communication), a linguist from the Summer Institute of Linguistics, who is working in the area.

5.2 NON-AUSTRONESIAN LANGUAGES

5.2.1 THE KOVAI ISOLATE

This language has a decimal system, and is the only non-Austronesian language in the Morobe Province to possess one. A reasonable explanation of this would be in terms of the geographical location of Kovai speakers on Umboi Island, surrounded by Siassi Family Austronesian languages which have decimal systems.

5.2.2 THE EASTERN HUON FAMILY

The following types of counting systems are found:

Dedua	F	Mape	C
Kâte	C	Migabac	E
Kosorong	F	Momare	F
Kube	F	Sene	F

Although all languages use systems depending for higher numbers on hand and foot tallying, there is considerable variation in the number of distinct numeral words employed. Five languages use four numerals, one language uses three numerals, and two languages have only two numerals.

THE WESTERN HUON FAMILY

The following types of counting system are found:

Burum	F	Ono	E
Kinalakna	C	Selepet	F
Komba	F	Sialum	E
Kumukio	E	Timbe	F
Mesem	F	Tobo	F
Nabak	E	Yaknge	F
Nomu	C		

As with the Eastern Huon Family, all languages of the Western Huon Family employ hand and foot tallying to describe higher numbers, but there is variation in the number of distinct numeral terms employed. Two languages rely on two numerals only, while three languages have three numerals. The majority of the languages (seven) have four numeral terms.

5.2.4 THE ERAP FAMILY

The following types of counting system are found:

Finungwa	C	Nimi	C
Gusan	C	Nuk	C
Mamaa	C	Numanggang	C
Munkip	C	Sauk	C
Nakama	E	Urii	E
Nek	C		

There is much consistency here, with nine of the eleven languages using only two numerals followed by hand and foot tallying. The remaining two languages differ only in having a third numeral term.

5.2.5 THE WANTOAT FAMILY

The languages in this family have the following types of counting system:

Bam	B	Wantoat	C
Irumu	C	Yagawak	B

All four languages have only two numeral words. Informants in two of the languages described tallying on hands and feet, while those of the other two languages did not.

5.2.6 THE GUSAP-MOT FAMILY

The only representative of this family in the Morobe Province, Ufim, has a type F system with four numeral words and thence tallying on hands and feet. According to Claassen and McElhanon (1970:70), this is typical of the languages of the family, the remainder of which are spoken in the Madang Province.

5.2.7 THE YUPNA FAMILY

This family also straddles the border between the Madang and Morobe Provinces. The counting systems in the three Morobe representatives are as follows:

Bonkiman	E
Yupna	E
Koripon	E

All three are of a similar type with three numerals followed by hand and foot tallying.

5.2.8 THE URUWA FAMILY

The Uruwa Family languages have the following types of counting system:

Komutu	E	Weliki	E
Sakam	A, E	YHau	F
Som	D		

There is a variety of types here. Most have three numeral words, although no tallying on hands and feet was described by informants in the Som language. The Yau language had four numeral terms, and the Sakam language was the only one in Morobe where any form of body counting was encountered. Two nostrils were included in the tallying sequence to give a tally total of 22.

5.2.9 THE PIHOM STOCK

The Wasembo language, which apparently has no close relatives, has a counting system with three numerals and hand and foot tallying, that is it belongs to type E.

5.2.10 THE EASTERN FAMILY, EAST NEW GUINEA HIGHLANDS STOCK

The Waffa language is the only Morobe representative of this family, which is spoken mainly in the Eastern Highlands Province. The Waffa counting system is of type C, with two numerals and hand and foot tallying. Information on other languages in the family is incomplete. Bee (1973:727) notes that the Usarufa system has three numerals and then tallying. Word lists in McKaughan (1973) include numerals in several languages of this family. They list translations of 'four', 'five' and 'ten', but accounts of the systems are not provided, and these may be tallying terms rather than distinct numerals. According to Lancy (1978:7), hand and foot tallying is typical of the Eastern Highlands area.

5.2.11 THE ANGAN FAMILY

Languages of this family are spoken in the Morobe, Gulf and Eastern Highlands Provinces. The Morobe representatives have the following types of counting system:

Agaataha	F (E?)	Menya	C
Hamtai	C	Safeyoka	C
Kamasa	C	Yagwoia	C
Kawatsa	C	Susuami	C

All except the Agaataha language have only two numerals followed by tallying on the fingers and toes. Agaataha has either three or four numerals, depending on whether the expression for 'four' is considered to be a combination of 'two and two' or not. Languages belonging to this family spoken in the Gulf and Eastern Highlands Provinces appear to be similar to the majority (Lloyd 1973:87).

5.2.12 THE KUNIMAIPAN FAMILY

The languages of this family spoken in the Morobe Province have the following types of counting system:

Biangai	C
Kunimaipa	C
Weri	C

All three types are similar, with two numeral terms followed by tallying on the hands and feet. Counting methods in other languages of this family spoken in Northern and Central Provinces appear to be similar (Dutton 1975:263).

5.2.13 THE BINANDEREAN FAMILY

Languages of this family are spoken in the Morobe and Northern Provinces. The Morobe representative have the following types of system:

Binandere	E	Suena	C
Guhu-Samane	E	Yekora	C
Mawae	E	Zia	C

All use hand and foot tallying. Three languages employ three numeral words, while the other three have only two numerals.

5.3 CONSISTENCY AND VARIATION

There is evidence here to support Laycock's statement (1977:219) that closely related languages may show widely differing counting systems. However, counting types are not distributed randomly throughout the languages; there is also a good deal of consistency within certain families.

5.3.1 NON-AUSTRONESIAN LANGUAGES

The non-Austronesian languages of Morobe show a reasonable degree of consistency in the counting methods employed, and this has been remarked upon by several linguists. Claassen and McElhanon's account of the Finisterre Stock language families includes the comment (1970:70):

Counting systems are uniform throughout the languages included in this survey. Counting begins with the small finger of one hand, progresses through the other hand, the toes of one foot and finally the toes of the other foot to a complete unit of twenty. Numerals one through four are expressed by separate terms...

This generalisation covers the languages of the Wantoat, Erap, Gusap-Mot, Western and Eastern Huon and Yupna Families. While the statement does not accurately reflect the variation in the number

of distinct numeral words, it does indicate the underlying similarity in the counting methods of the non-Austronesian languages of the Huon Peninsula.

Lloyd (1973:87) is likewise struck by the uniformity of Angan counting methods:

(Angan Family) counting systems are very similar...there are words for 'one' and 'two' and phrases, literally 'two one' for 'three' and 'two two' for 'four'. For higher numbers the nouns 'hand' and 'foot' are used.

Dutton, too, stresses similarities when commenting on the counting systems of the South-Eastern Trans-New Guinea Phylum languages, which include both the Binanderean and Kunimaipan families (1975:623):

Counting systems are based on two or three (e.g. 1, 2, 2 + 1, 2 + 2, 1 hand or 1, 2, 3, 2 + 2, 1 hand).

The major exception to this consistency is the Kovai language of Umboi Island. In this language there is a decimal system with words for ten and twenty, that is, a type H system according to the classification adopted in section 4. The occurrence of a decimal system here may be explained by the proximity of other similar systems: the Kovai language area is surrounded on all sides by Siassi Family languages of the Island Group, all of which have decimal systems. This situation is rather similar to that of the Yeletne language referred to in section 1. This non-Austronesian language has a complete decimal series and occurs in an area completely surrounded by Austronesian languages.

5.3.2 THE AUSTRONESIAN LANGUAGES

The Austronesian languages show a great deal of variation in the extent of their numerical resources. This is surprising, since reconstructions of a complete set of ten numerals are available for ancestral languages known as Proto-Austronesian and Proto-Oceanic. If these proto-languages are indeed the ancestors of today's Austronesian languages in Morobe, there has evidently been a loss of numerical resources in the descendant languages. A more detailed discussion of this situation is reserved for the following section.

6. COUNTING AND CULTURE HISTORY

6.0 INTRODUCTION

The nature and distribution of counting systems in Morobe Province pose some interesting problems with respect to the culture history of the area, in particular the interaction between groups speaking Austronesian languages and those speaking non-Austronesian languages. Before these problems are addressed, the general culture history of the region is considered in some detail, especially linguistic aspects. Some mechanisms of change in relation to language and counting are then discussed. Finally, an explanation is offered in terms of cultural and economic factors which could account for the present distribution of Morobe's counting systems.

6.1 CULTURE HISTORICAL FACTORS

6.1.1 LANGUAGE AND CULTURE

The island of New Guinea appears to have been inhabited for at least ten thousand years and possibly much longer, which indicates that the first inhabitants were almost certainly hunters and gatherers (Bulmer and Bulmer, 1964:41). When considering such enormous time spans, a certain amount of conjecture is involved in any reconstruction of events. However, a number of theories have been proposed which are of relevance to the Morobe situation. Schmitz (1960a) specifically considered past movements into the Huon Peninsula, and describes evidence for the existence of three basic culture types. What he refers to as culture A is described as consisting of 'proto-negroid' people of short stature who first entered the eastern half of New Guinea from the west across mountain valleys. Culture B, the 'neo-Melanesians', typified a planting culture and entered at a later date from the coast along river valleys. Finally, culture C, consisting of maritime Austronesian-speaking migrants, arrived relatively recently. Such a picture is somewhat simplistic and based on rather superficial evidence, but the idea of a relatively recent arrival of Austronesian-speaking migrants from the west to an island already inhabited meets with fairly widespread assent. Chowning, reviewing the situation notes (1973:8):

...it is generally accepted that the first inhabitants of the island of New Guinea itself spoke non-Austronesian languages. Their distribution alone is sufficient proof; Austronesian languages occur in New Guinea only in scattered and isolated spots along the coast, very rarely penetrating for any distance into the interior.

It is worth noting that the Morobe Province contains the area of greatest penetration of Austronesian languages into New Guinea, a fact to bear in mind when considering the extent of the influence of non-Austronesian languages on Morobe Austronesian languages.

The origin of Austronesian speakers, who occupy an enormous geographical range bounded by Madagascar, Formosa, New Zealand and Eastern Polynesia, has been the subject of a great deal of study and speculation, and no one theory is universally accepted. Dyen (1971:31) considers that the place of origin is likely to be the area of maximum diversity, which appears to exist in Western Melanesia. This region is therefore postulated as the homeland of the ancestral or proto-language of all the Austronesian languages (Proto-Austronesian).

A more generally held view approximates the position adopted by Grace (1961:367):

The linguistic data known to me suggest the following historical outline. The Proto-Austronesian language was probably spoken in or near South East Asia. At a considerably later date a language was spoken, most probably on or near the north coast of New Guinea, which became the proto-language of the Eastern Austronesian sub-group.

An Oceanic sub-group within the Austronesian languages has been identified mainly on the basis of a number of shared phonological innovations (Grace 1961:363). This sub-group is considered to consist of the Polynesian languages, nearly all Micronesian languages and most of the Austronesian languages of Melanesia. Attempts at the reconstruction of a proto-language ancestral to this group, called Proto-Oceanic, have also been made, but so far have concentrated mainly on phonological features. The possible existence of a 'New Guinea cluster' or New Guinea Oceanic group within Oceanic is still the subject of debate (Milke 1965, Capell 1969, 1971, 1976, Pawley 1978, Lynch and

Tryon 1983). Chowning argues against over-simplified explanations based on uni-directional movements of peoples, but considers it reasonable to assume (1973:8) that :

...some of the present 'Melanesian' languages, including most of those on the north coast of New Guinea...are the descendents of Austronesian languages that entered Melanesia early from the west and underwent a long local development, almost certainly influenced by the presence of non-Austronesian languages.

The possible influence of non-Austronesian languages on the numeral sets of Austronesian languages will be examined in more detail in later sections.

6.1.2 ANCESTRAL NUMBER SYSTEMS

A considerable amount of work has been done on reconstructing elements of Proto-Austronesian. Dahl (1976), drawing on the work of Dempwolff (1934-1938), Dyen (1962, 1965) and others, reconstructs grammatical features of Proto-Austronesian, as well as phonemic and vocabulary items. Of particular interest here is the reconstruction of numerals (Dahl 1976:122):

...cardinal numbers from 1 to 10 are considered : **ita*, **dzuSa*, **təlu*, **sə(N)pat*, **l(l)ima*, **uənəm*, **pit(l)u*, **uala*, **tiua*, **puluq*. From 20 to 90 the numerals are generally composed of **puluq* preceded by other numerals.

Thus it is assumed that the speakers of the ancestral language of all Austronesian languages, including those in Morobe, had a complete decimal series of numerals, possibly up to thirty thousand years ago.

As in Proto-Austronesian, there is reconstructed in Proto-Oceanic a complete decimal set of numerals (Grace 1969, Wurm and Wilson 1975):

1	<i>*nsa</i>
2	<i>*dua</i>
3	<i>*tolu</i>
4	<i>*pat</i> , <i>*pati</i>
5	<i>*lima</i>
6	<i>*onom</i>
7	<i>*pitu</i>
8	<i>*walu</i>
9	<i>*nsiwa</i>
10	<i>*ngapulu</i>

An alternative form of ten, **nsangapuluq* has been suggested by Ross (personal communication). The relationship of this series to some numerals of today's Morobe Austronesian languages can readily be seen, for example the first five numerals in the Mangap language of Siassi:

1	<i>ta</i>
2	<i>ru</i>
3	<i>tel</i>
4	<i>pang</i>
5	<i>lamata</i>

However, other Austronesian languages in the area have numeral words which cannot so easily be related to Proto-Oceanic, for example Barim *bayerta* 'five', Kapin *vei* 'four' and Yama *yi* 'two', although Siegel (personal communication) has suggested possible derivations for some of these. Although there are numerous cognates for the numerals one to five, there are no instances among the Morobe Austronesian languages of numerals between six and nine cognate with those reconstructed for Proto-Oceanic. Instead, additive expressions are used to represent these numbers.

The historical development of the non-Austronesian languages has not been researched in such detail. However, none of the available evidence (e.g. McElhanon 1973) indicates the existence of former extensive numeral series for any of the Morobe families.

6.2 MECHANISMS OF CHANGE

Complete decimal series of the kind described in Proto-Oceanic are by no means uncommon in the area. Laycock comments (1975:224):

Pure decimal systems characterise many Austronesian languages of Island Melanesia, Polynesia and Indonesia.

However, it has already been pointed out that not a single one of the 40 Austronesian languages of the Morobe Province has a complete decimal set. This at first sight is somewhat puzzling, and in considering possible explanations for this state of affairs it may be as well to look at the kinds of changes which can take place, first in counting systems and then in languages generally.

6.2.1 CHANGES IN COUNTING METHODS

The counting system or systems found in a community are not static, and a number of ways in which they could be modified are considered here. Firstly, development from a simpler to a more complex system could take place. Systems classified as type B, with two numerals and no tallying, could easily change to a system classified as type D, which involves tallying on the hands and feet to a total of 20. No new words would be needed for this. In fact some language groups showed a certain amount of variation, for example where some informants described a type B system and some described type D. If necessary, additional numeral words could be added to the counting repertoire by adapting words such as the names of fingers or body parts to serve the function of numerals, and there is some evidence that this has taken place in some languages (Cheatham 1978:17). In the Guwot language, only two numerals were described, but informants could readily provide a named series of five fingers. There is also evidence that the word for 'big toe' was adopted as the word for 'twenty' in the Yupna language of the Finisterre Mountains (see Appendix A). Hooley (1978:158) describes certain named sequences among the Buang, such as birth order names as far as eight, and similar series were described by informants in the Nabak and Labu languages. It seems, then, that there is no problem handling sequences of several terms, even when numeral words are limited in a language.

When tallying on hands and feet, many languages involve cumbersome circumlocutions which vary from speaker to speaker and cannot be regarded as numerals; they are merely the description of the tallying process which takes place as successive digits are marked off. These terms could become abbreviated and conventionalised to give a stereotyped numeral series in place of a variable repertoire of phrases describing the actions accompanying tallying. This may have taken place in the Komba

language of the Huon Peninsula, where, although a tallying procedure is used, descriptions of the system by different informants were unusually concise and consistent. Similarly, the words from six to nine in some Austronesian languages such as Tami and Mutu appeared to be abbreviated and stereotyped, although the process of addition to form these numerals still showed clearly.

Another process which could increase the numeral repertoire of a language is that of borrowing. This would present no great difficulty in an area such as New Guinea where multi-lingualism and dual-lingualism are widespread (Sankoff 1977, Lincoln 1975b, Laycock 1979). Additional numerals from neighbouring languages could be added to a series and in this case it would not always be easy to tell if the presence of a word was due to borrowing or not. Where the word for 'five' is also the word for 'hand', ambiguity could be reduced by adopting the word for 'hand' in a neighbouring language to represent the numeral.

Alternatively, the adoption of whole sets of numeral terms could take place. This seems to have occurred in some other areas of Papua New Guinea, for example on Rossel Island in the Milne Bay Province, where a decimal series has been adopted into the non-Austronesian Yeletne language from surrounding Austronesian languages, although some at least of the original Yeletne terms have been retained. The Kovai language of Umboi Island in the Morobe Province is in a somewhat similar position, being a non-Austronesian language completely surrounded by Austronesian languages of the Siassi Family. Indeed, the Kovai counting system appears to be more typical of the surrounding languages than of its closest non-Austronesian neighbours, but the words used are not apparently Austronesian in origin. The idea behind the counting system seems to have been adopted while retaining words from within the language to describe it. A similar situation obtains in the non-Austronesian Flores-Timor languages further west in Indonesia (Capell 1976b:539); decimal numeral series have been adopted from neighbouring Austronesian languages, but in some cases words or constructions from the original system have been retained for part of the series. Similarly, the influence of Tok Pisin numerals in recent decades appears to have been great. Laycock and Wurm (1979:202) note:

Particularly common is the use of *lingue franche* numerals in place of vernacular numerals, especially for numbers greater than 'two' in languages whose system is binary or binary/quinary only.

A third process which could affect a numeral series is that of reduction. In the Austronesian languages of Morobe, this seems to have been more common than expansion of a series. The Roinji language of the Rai Coast, for example, is an Austronesian language, descended from Proto-Oceanic, but unlike its ancestor it only has two numeral terms. Similarly, languages of the Adzera and Buang Families generally have only two or three numerals. Where decimal systems occur in Morobe Austronesian languages, they are all incomplete, involving simple addition from six to nine. Something has evidently happened to the remaining Proto-Oceanic numerals, and the most likely cause would appear to be interaction with neighbouring non-Austronesian languages. This is discussed in more detail below.

6.2.2 LANGUAGE CHANGE

It is widely acknowledged that the Austronesian languages in the New Guinea area have been 'influenced' by non-Austronesian languages (see e.g. Capell 1976b). However, the exact dynamics of the processes by which one language is influenced by another are complex, and difficult to

observe, let alone reconstruct. Nevertheless, a number of explanations have been postulated, and some of these may be relevant here.

There is some evidence that 'language mixture' has taken place where some Austronesian and non-Austronesian languages have come into contact. Although the existence of this process has been questioned, the concept is defended by Capell (1976:529):

...the idea of a language belonging simultaneously to two different language families is to be rejected. Even a so-called 'mixed language' has a single parent language. But such a language also has an *invader*, and when the balance of relationship to the original mother tongue – the true ancestor – is outweighed by the invader's contribution in lexicon *and* structure, it is right to speak of a mixed language.

Other languages for which a mixed status has been suggested are Magori in South-East Papua (Dutton 1976), the Reef-Santa Cruz Family in the Eastern Solomons (Wurm 1976), and in Morobe, Kube and Dedua (McElhanon 1970a:230).

Whatever the status of these languages, it is evident that certain features such as vocabulary items pass relatively easily from one language to another in multilingual Papua New Guinea. Bradshaw refers to the situation in Numbami, a Huon Gulf Austronesian language as follows (1978a:30):

As to how well they speak their own language, most Numbami will acknowledge somewhat self-deprecatingly that *i manggo binga miks*, 'we speak our language mixed', the form of the statement itself evincing the truth of its claim.

While vocabulary items pass fairly readily from one language to another, structural features appear to be more basic and not borrowed so easily. Hence in the case of one language being influenced by another, a 'substratum' of basic features may persist and give indications of its ancestry which are not immediately apparent from more superficial features. It is not always easy to sort out such features, especially when the languages involved have not been studied in any great depth, as is the case with many Morobe languages. As Bradshaw noted (1978b:54) when considering the Labu language:

It seems as likely to be a Siassified Azera language as an Azerified Siassi language.

The process of pidginisation may have been involved in the development of some Morobe languages. A pidgin language is based on a simplified lexicon and grammar and arises in situations where different language groups need to communicate for specific purposes. Such a situation can easily be imagined in the context of North-East New Guinea. Expansion and diversification occur if a pidgin language becomes creolised, that is, becomes the native language of a new generation of speakers. While the lexicon of a pidgin language may be derived largely from one language, the grammatical features of another may be retained. This process could account for the existence of a limited numeral series in Morobe Austronesian languages. For example, if a pidgin language relying on vocabulary items from an Austronesian language was used by a culture familiar with only two numeral words, the atrophy of the remainder of the decimal series could easily occur. If languages such as Roinji and Nengaya were descended from such a pidgin language, the existence of only two numeral terms in the language could be accounted for. A similar situation could be postulated for the Adzera Family languages. This, however, is pure conjecture, and such a development cannot be assumed without a good deal more evidence, no matter how convenient an explanation it may present. There are many objections to the 'pidginisation' hypothesis, and it is more likely that the effects of multilingualism bring about language changes of this kind.

6.3 COUNTING IN ITS CULTURAL CONTEXT

6.3.1 COUNTING IN ACTION

Further clues to the causes of the apparent regression of numerical resources in the Morobe Austronesian languages lie in the cultural context of counting in the region. As noted by Bowers and Lepi (1975:309), a list of numeral terms and their translation gives little indication of the way reckoning is carried out in a society. As was seen in section 1, it is only since a number of ethnographic studies have been carried out, mostly in the Highlands, that we have got much closer to an understanding of how counting takes place in its cultural context in Papua New Guinea (e.g. Franklin and Franklin 1962, Bowers and Lepi 1975, Strathern 1977, Thune 1978, Cheetham 1978, Biersack 1982). Some of the cultural factors relevant to a consideration of counting in context are illustrated by the following examples.

Strathern (1977) describes the Melpa counting system in action during *moka* exchanges. Here, 'big men' aim at a 'grand set' of pigs for distribution at a small *moka* ceremony. Since the counting base may be eight or ten depending on whether or not the thumbs are used, the set may be 8 x 8, 8 x 10 or 10 x 10. The bamboo tallies worn around the neck by Melpa men are well known as records of the shells given away during *moka* ceremonies, each bamboo slat representing a set of eight or ten shells. However, Strathern points out that these tallies are not memory aids, and would be unnecessary as such, but function as a public display of *moka*-making activity. The prestations, or gift exchanges, are intimately concerned with inter-group relations and are events of great social significance.

Similarly, Bowers and Lepi (1975:322) make the following comment about counting as performed by the Kakoli of the Upper Kaugel Valley:

Kaugel counting does not exist in isolation. It quantifies and qualifies relations between people, objects and other entities.

The system described is based on four and 24, but formal counts involving higher numbers only take place in the context of the exchange of valuables. The system, with bases of four and 24, has a number of unusual features, and is particularly notable for the degree of abstraction ascribed to it by the authors (1975:316). It is postulated that the system may have developed due to the needs of an expanding prestige economy.

Biersack, on the other hand, comments on the degree of concreteness exhibited by the Paiela, another Highland group from the Enga Province in their counting behaviour. She argues that a tallying system tied to a concrete set of objects or body parts need not imply a deficient cognitive capability. Noting that Paiela counting exhibits what has been characterised (e.g. Hallpike 1979) as cognitive immaturity based on an incomplete logic, she states (1982:6):

Paiela counting is concrete in just those ways Hallpike claims to be characteristic of primitive counting systems. The Paiela always enumerate; they never compute. There are elaborate tallying procedures in the event that the items being counted are absent. Finally the words for numbers are also the names of body parts.

However, following a detailed and sensitive analysis of their counting behaviour as a semiotic system, she concludes that in this context, the concreteness ceases to be misplaced:

Underlying the semiotic logic of the Paiela counting system is an abstraction: the concept of information itself...the concept of information plays the same role that the concept of number plays in western counting systems: the role of governing abstraction.

Common to accounts of Biersack, Bowers and Lepi, and Strathern, is the importance of the idea of pattern in counting behaviour, especially at formal prestations. Biersack pays considerable attention to the concept; its importance in counting pairs, in variations in the body sequence, in the Paiela principle that 'relationship and heirarchy, not unit and iteration, are the sources of multiplicity' (1982:30). Strathern describes the public display which accompanies the counting of pigs and formerly shells prior to their distribution. The stakes to which pigs are to be tethered may be driven into place for everyone to see months before the actual distribution. Bowers and Lepi, while stressing the abstract nature of the Kaugel system, note that counting during formal distribution is also accompanied by an important public display consisting of lines or heaps of wealth objects.

Even though such distributions may involve accurate tallying of the number of valuables distributed, the primary objective appears to be to provide a relative rather than an absolute measure. Strathern comments (1977:19):

The final number is taken as a figure to be compared with previous occasions of a similar kind and as a standard for future returns from the recipients.

When complex series of debts and credits are to be remembered by organisers of such distributions, external calculating devices are seldom necessary. The fingers can be used to enumerate items or persons involved, but such is the cultural importance attached to the exchanges that the reality of each transaction is kept alive between formal ceremonies by constant references in conversation.

In Morobe societies for which ethnographic accounts are available, and in coastal societies of Papua New Guinea in general, prestations seem to take place on a smaller scale than in Highlands areas. Nevertheless, pattern and display are still important aspects of the gift-giving process, and a public distribution is likely to lay more stress on visual aspects than the enumeration of a total. As the writer has noted elsewhere (Smith 1981:7) prestations among the Adzera of the Markham Valley may involve an enormous number of bunches of bananas, but counting the exact number of bunches is not considered necessary, and other forms of visual display are employed, such as tying the bunches on to a framework reaching the top of a coconut tree. Read (1950:206) observed similarly impressive displays by the Adzera at *mugus* festivals where yams were displayed prior to distribution. Again, an important feature was the concept of relative rather than absolute quantity. It would appear, then, that tallying systems and limited numeral series are quite adequate for dealing with transactions of this kind.

Numbers may, in fact, sometimes appear to be redundant, and Thune (1977) observes that the numerical resources of the Loboda of Milne Bay are not fully utilised. While there is a counting system reaching into the hundreds, counting and enumeration of objects are unimportant in the culture and occur only rarely. Instead, a non-numerical way of looking at the world is described, emphasising relative rather than absolute measures. In such a situation, regression of numeral sets could easily be imagined.

6.3.2 TRADE AND EXCHANGE

In Morobe Province, more complex exchanges have traditionally taken place as part of extensive trading networks. Hogbin (1947b, 1951) gives an account of trade around the Huon Gulf, while details of a network centred on the Siassi Islands appear in Harding (1967, 1970), Freedman (1967, 1970), Allace (1976) and Pomponio (1983). This network linked communities as far apart as New Britain, the Huon Gulf, Madang and the Huon Peninsula hinterland, and it would seem reasonable to assume that the possession of a complete decimal set of numerals would be a useful resource for calculating beneficial trading terms. However, it is in just this type of cultural environment that the regression of decimal numerals appears to have taken place. A detailed examination of what took place during trading interactions may give some idea of the mathematical requirements of participation in trade of this type.

The importance of ceremonial exchange in inter-group rivalry and alliance, and as a stage for politically ambitious 'big men' is a well-documented feature of many Melanesian societies. Since Malinowski's pioneering work in the Trobriand Islands (1922), it has been acknowledged that trade in Melanesia involves a number of such ceremonial features. A great deal of energy is expended, for example, in *kula* expeditions in the Milne Bay waters, even though some of the exchanges appear to outside observers to have little intrinsic economic value. Thus it might be argued that such overseas expeditions should be thought of not so much as trading ventures as complex social rituals.

However, Harding considers that social, ritual and political aspects of trading have been over-emphasised in ethnographic accounts of Melanesian societies and maintains that the primary function is economic. The Siassi, for example, '...engaged in social rituals of exchange as a means of acquiring valued need-serving goods.' (1970:108). They acted as middlemen, exchanging goods at favourable rates by manipulating exchange ratios in the different Vitiaz Strait ports. A pig, for example, could be exchanged on Umboi for five to ten packets of sago, which in turn were exchanged at Sio or Gitua for 50 to 100 pots. These pots could then be transported to New Britain, where they yielded five to ten pigs (Harding 1970:139). Thus goods of little value in one community were transported to others where they were in short supply, or had high prestige, usually for ceremonial purposes, and thereby yielded a profit.

The *kula* of Milne Bay and the Siassi overseas expeditions, it must be stressed, are not identical systems, and it is pertinent to compare Morobe trading patterns with those elsewhere. Strathern (1983) draws comparisons between a number of exchange systems including Milne Bay, Siassi, Enga, Melpa and Tolai, especially with respect to rules governing exchanges and strategies adopted to exploit them. He indicates some points of similarity: the matching of return gifts, the introduction of new and unsolicited gifts into exchange partnerships, the 'two fundamental aims of demonstrating prestige and at the same time continuing friendly partnerships' (1983:87). On the other hand, there are considerable differences in detail, and the Highlands systems described appear to be less stable than the more conservative *kula*, due, in part, to sensitivity to changing economic conditions.

In these exchange systems, the concept of profit requires close examination. In the Melpa *moka* exchanges, for example, where a form of 'profit' appears to be built in to the system, material losses are nevertheless made up as gains in political prestige. Although surplus 'profits' of *tambu* shell may be acquired among the Tolai, they tend to be stored for subsequent redistribution. And in the *kula*, Strathern notes (1983:80):

The category of 'profit-making' tends, therefore to dissolve when considered more closely, into other categories. First, the 'profit' may have to be returned later. Second, it

is in any case a by-product of competitive giving, the aim of which is to acquire renown. Third, it may simply represent the wish by the donors to maintain the partnership... It is better, therefore, to refer to 'incremental giving' rather than to a 'principle of profit'.

In Morobe, too, the acquisition of profit was not the basic aim. Harding notes (1970:105):

Ultimately the concept of profit appeared irrelevant because the objectives of trade for any participant community were highly specific. The Siassis counted the returns of trade in pigs and vegetable food which could be reserved for the 'feasts of merit' staged by local leaders. The Komba mountaineers were drawn to Sio because 'they smelled the grease of our coconuts', 'they were hungry for fish and salt'. Because of these specific objectives, transactions that might be judged unprofitable as measured by comparative inputs of labour time were desirable nonetheless.

In Siassi, any 'profit' gained was essential both for subsistence needs in their over-populated communities and for the prestige of men sponsoring feasts celebrating various stages of the life-cycle. It was not merely an accumulation for private individual use, and Freedman notes (1970:318):

The promotion of private accumulation, in Siassi, is ultimately in the public interest...most private wealth is distributed in village-wide ceremonies.

Another aspect of trading in the Vitiaz network should be emphasised, and that is the role of trade partners. Although trading involved the manipulation of an awesome array of exchange ratios, it was not an impersonal affair designed to maximise acquisition at all cost, but involved a category of people who were regarded as kinsmen. Depending on relative age, trade partners would call one another 'brother', 'father' or 'son', and these relationships might be carried on in later generations until the distinction between 'real' and 'trade' kinship became blurred. Since transactions were carried out with a category of kin, exact computation of exchange rates or enumeration of totals may not have been as important as it otherwise would have been. Nevertheless, it does seem that there was general agreement about exchange ratios; discrepancies recorded probably reflected the wide range in size and quality of the various commodities (Freedman 1970:154). Close trade partnership was associated not so much with differences in rates of exchange as with a time delay between initial gift and return (Freedman 1970:165).

The establishment of trade partnerships had a number of important advantages. In an area where warfare was endemic, a trade partnership afforded protection in an otherwise hostile community. Since exchanges were of such economic importance to both parties, this temporary suspension of hostility appears to have been strictly observed. The 'credit' extended in delayed return has been mentioned above. Pomponio (1983) stresses the role of trade partnerships in the extension of a kin network by prospective big-men. The establishment of a new trade partnership eventually transformed strangers into brothers, and an exchange of women in marriage commonly followed, thus creating affines. An additional link could be established by the adoption of children. What Pomponio refers to as 'Mandok concepts of personal investments in people' (1983:181) were thus brought into operation as a means of acquiring a group of people on whom a man could rely for support in various prestige-enhancing enterprises.

The importance of these trade partnerships is illustrated by the strict etiquette observed by partners (Harding 1967:166). Haggling over prices was not acceptable, and gifts had to be accepted graciously. Stealing of trade partners or undercutting of prices were likewise serious offences, while an underlying general principle of reciprocity avoided undue advantage being taken of the situation. The observance of this code of ethics suggests that the maintenance of amicable trading relationships

was considerably more important than insisting on the most beneficial rates of exchange. It is thus postulated that after the Austronesian-speaking migrants arrived in North-East New Guinea, their complete decimal numeral set became redundant in the social and economic context in which they found themselves. This could account for the regression of numeral series which appears to have taken place in the Austronesian languages of Morobe investigated here.

CONCLUSION

What began as data collection for the Indigenous Mathematics Project ended up as a historical linguistic conundrum : the reasons for the apparent regression of numeral series in the Morobe Austronesian languages.

The data presented here indicate that throughout the area under investigation, a system of counting involving tallying and the use of two, three or at most four numeral words was traditionally the predominant method of reckoning. Those languages which have a greater repertoire of numeral words tend to be coastal Austronesian languages of the Vitiazan sub-family, and the implication is that these languages are relatively recent arrivals in North-East New Guinea. However, the extent of the numeral series in these languages is small compared with series that have been reconstructed for the ancestral proto-Austronesian and proto-Oceanic languages.

A consideration of the social, cultural and economic context of counting in this area suggests that a complex abstract counting system was not needed for successful participation in most aspects of traditional life. Although formal ceremonies of exchange were significant cultural events, visual aspects of display were more important than abstract measures of quantity. Even in the more sophisticated trading systems of the Vitiaz Strait communities, computation of favourable exchange terms and exact enumeration of totals appeared to be secondary considerations. Social factors such as the maintenance of harmonious trade relationships were vital to ensure the supply of essential commodities and expand kin networks in the incessant pursuit of prestige.

It is therefore suggested that in this cultural milieu the means of computing exact totals and manipulating abstract amounts became redundant. Redundancy led to atrophy of the complete decimal series, and hence the counting systems of the Austronesian-speaking arrivals in North East New Guinea progressively came to resemble those of their non-Austronesian-speaking neighbours. The greater the penetration of Austronesian-speakers inland, the closer the resemblance became. More recently, the demands of a money-oriented economy have brought about the widespread adoption of Tok Pisin numerals for most non-traditional purposes.

APPENDIX A

COUNTING DATA FOR MOROBE LANGUAGES

Counting data are presented for the languages of Morobe in the order they appear in McElhanon's classification described in section 2.2.2. Thus the Austronesian languages are described first, followed by the non-Austronesian languages.

The data mostly consist of broad phonetic transcriptions of verbal responses. Since the primary purpose is to determine the kind of counting method employed, a narrower and more precise phonetic transcription was not considered to be essential. There will therefore be occasional deviations from the standard orthographies which may have been devised for some of the languages. Where data are

wholly based on written information from linguists, the orthography adopted by them has been used, and this has been indicated.

Two special symbols have been employed here. The symbol ə represents an unaccented neutral vowel, rather like the final sound in the English word 'teacher'. The symbol c is a glottal stop.

Translations of vernacular terms are only given where they mean something other than a numeral, such as a description of tallying. Where the meaning is considered to be obvious, such as reduplication of a previous term, the translation is omitted. In some cases, the exact meaning of terms could not be elicited, and this is indicated where it occurs.

PART ONE: AUSTRONESIAN LANGUAGES

1. BUKAUAC

This Austronesian language is classified by McElhanon (1984) as belonging to the Huon Gulf group of the Vitiazan Sub-Family of the Siassi family. It is spoken in 32 villages in coastal areas on the south of the Huon Peninsula, and is one of the province's larger languages, with nearly 10,000 speakers. However, in spite of its size and the fact that it is spoken close to the provincial headquarters, Lae, very little linguistic research has been done on the language. Much more research has been carried out on the related Yabim language, although how closely the latter is related to Bukauac is not clear.

The following counting system was compiled from information from a number of informants.

1	<i>tigen</i>	
2	<i>lu</i>	
3	<i>to</i>	
4	<i>hale</i>	
5	<i>lim dang</i>	five one
6	<i>lim dang ngando tigen</i>	five one and one
7	<i>lim dang ngando lu</i>	
8	<i>lim dang ngando to</i>	
9	<i>lim dang ngando hale</i>	
10	<i>sahuc</i>	
11	<i>sahuc ngando tigen</i>	ten and one
12	<i>sahuc ngando lu</i>	
13	<i>sahuc ngando to</i>	
14	<i>sahuc ngando hale</i>	
15	<i>sahuc ngalim</i>	
16	<i>sahuc ngalim ngando tigeng</i>	
17	<i>sahuc ngalim ngando lu</i>	
18	<i>sahuc ngalim ngando to</i>	
19	<i>sahuc ngalim ngando hale</i>	
20	<i>ngac sambuc</i>	one man complete
21	<i>ngac sambuc ngando tigeng</i>	
30	<i>ngac sambuc ngac sahuc</i>	
31	<i>ngac sambuc ngando sahuc ngando tigeng</i>	
40	<i>ngac lu</i>	

50	<i>ngac lu ngasahuc</i>
100	<i>ngac lim dang</i>

There were some variations recorded for different informants in different villages. As well as some form of *tigeng* for 'one' (e.g. *tikeng*, *tigen*, *tegens*), the word *dang* was also used. *ulu* was a variant of *lu* for 'two', and 'three' was variously *to*, *tu*, *tur* and *tou*. The commonest expression for 'five' was some variation of *limdang*, but the word for 'hand' was given as *amang*. Some informants gave 'five' as *amang dang* or *emandang*. *sahuc* appears to be a distinct numeral word for 'ten' although other versions were given such as *amanglu* 'two hands' or *lambalu* 'fives two', and even as *amangdan* 'one hand' where 'five' had been given as *lemdan*. This confusion was also seen in words for '20', where *sahucdang* was sometimes used where 'ten' had been designated 'two fives' or 'two hands'. The commonest form of '20' was derived from 'one man' or 'whole man', *ngac sambuc* or *ngac dang*.

Thus the base of the system appears to be 20, with sub-bases of ten and five and separate numerals for one to four.

2. KAIWA

This is another Huon Gulf Group language spoken by just under 1,000 in five villages in the mountains behind the coast south of Lae. The language is sometimes known as Iwal. The following counting system was obtained from informants in Lae.

1	<i>dongke</i>	
2	<i>ailu</i>	
3	<i>aitol</i>	
4	<i>aivat</i>	
5	<i>bage tavlu</i>	hand half
6	<i>bage tavlu ano dongke</i>	hand half and one
7	<i>bage tavlu ano ailu</i>	
8	<i>bage tavlu ano aitol</i>	
9	<i>bage tavlu ano aivat</i>	
10	<i>bage isgabu</i>	hands full
15	<i>bage isgabu vatavlu</i>	hands full leg one
16	<i>bage isgabu vata lu ano dongke</i>	
20	<i>buni apmol til</i>	whole man one

An alternative for '20' was *bage isgabu be va isgabu*, that is 'hands complete, legs complete'. The system thus appears to be base 20 system based on a complete set of human digits with numerals for one to four. The word for five is the same as hand, and there is no separate word for ten. Numerals two to four appear to be cognate with the Proto-Oceanic terms.

3. KELA

This is another Huon Gulf Group Austronesian language spoken by nearly 3,000 people in ten coastal villages around Salamaua south of Lae.

The following counting system was obtained from informants in Lae.

1	<i>tunome</i>
2	<i>lua</i>
3	<i>tarawa</i>
4	<i>nga</i>
5	<i>lita</i>
6	<i>lita mangonua</i>
7	<i>lita mangolua</i>
8	<i>lita manga tarawa</i>
9	<i>lita mango nga</i>
10	<i>taomo</i>

Variations are *tamunua* for 'one' and *taumen* for 'ten'. The data are rather incomplete but suggest a system similar to the previous two languages with numerals for one to four, a base numeral five and another for ten. The word for 'hand' was given as *mange*, which is not the same as the word *lita* for 'five', but it is not clear if a form of *mange* is present in the expressions, for example *lita mango lua*. The word for 'and' was given as *mangi*. Hooley (1971) gives the word *taube* for 'ten', again a separate numeral term distinct from a tallying description.

4. LABU

This is a Huon Gulf Group Austronesian language spoken in three villages to the south of the mouth of the Markham River near Lae. Neglected by linguists for many years, some grammar sketches have recently appeared (Siegel 1984, Siegel and Kamake n.d.).

A counting system assembled from data provided by a number of informants is as follows:

1	<i>tugwatu</i>	
2	<i>salu</i>	
3	<i>sidi</i>	
4	<i>suha</i>	
5	<i>maipi</i>	
6	<i>maipi anendi tugwatu</i>	five and one
7	<i>maipi anendi salu</i>	
10	<i>numusu</i>	
11	<i>numusu anendi tugwatu</i>	ten and one
15	<i>numusu anendi maipi anendi</i>	
16	<i>numusu anendi maipi anendi tugwatu</i>	
20	<i>asamuni</i>	
30	<i>asamuni numusu</i>	
40	<i>asamu salu</i>	
50	<i>asamu salu numusu</i>	
60	<i>asamu sidi</i>	

The system has separate numerals for one to four with five also a numeral distinct from the word hand, although *maipi* could be derived from *nama ipi* meaning 'hand half'. Whatever the derivation, it appears to be used as a numeral rather than a literal description of a tallying process. Similarly the word for 20 appears to be used as a numeral although it too could possibly be derived

from 'man whole one'. There is a distinct numeral for ten, and multiples of ten and 20 can be formed quite easily.

An alternative system described '30' as *asamusidi* and '40' as *asamusuha*. It is not clear if this is actually used or was described in error, but is similar to an alternative system described for Lukep where higher numbers proceed by tens instead of twenties.

5. LAE

This is an apparently dying language reported by McElhanon to be spoken by less than ten old people in Kamkumung and Butibam villages in Lae. No informants could be located, and, as a result, no data are available. It is possible that the language is already extinct.

6. NUMBAMI

This Huon Gulf Group language spoken in a single village, Sipoma, by about 300 people, has been investigated by Bradshaw (1978b). The counting system has been described by informants as follows:

1	<i>sesemi</i>	
2	<i>lua</i>	
3	<i>tori</i>	
4	<i>wata</i>	
5	<i>nima teula</i>	hand half
6	<i>nima teula ano sesemi</i>	
10	<i>nima besua</i>	hands together
11	<i>nima besua ano sesemi</i>	
15	<i>nima besua ae teula</i>	hands together, legs half
16	<i>nima besua ae teula ano sesemi</i>	hands together, legs half and one
20	<i>tamota te</i>	man one
21	<i>tamota te ano sesemi</i>	
30	<i>tamota te nima besua</i>	
35	<i>tamota te nima besua ae teula</i>	
40	<i>tamota lua</i>	
50	<i>tamota lua nima besua</i>	
60	<i>tamota tori</i>	
80	<i>tamota wata</i>	
100	<i>tamota nima teula</i>	

As in other languages in the Huon Gulf Group, there are separate numerals for one to four. The word for five appears to be the same as that for hand, and there is no word for ten, the expression meaning 'hands together' being used. Counting proceeds on the digits of the feet as far as 'one man' for 20. Higher numbers involve repetition of this on 'another man'.

7. YABIM

The last member of the Huon Gulf Group languages is spoken as a first language by about 2,000 people in seven villages close to Finschhafen. However, Yabim was adopted as a lingua franca by the Lutheran Church for use in coastal areas and is used actively by about 25,000 people, while there are probably somewhat more with a passive knowledge of the language (Renck 1977b:852). A Yabim-German dictionary was published in 1917 by Zahn, and the numerals one to five are contained in it, although the counting system is not described in detail. The counting system from a variety of informants is as follows.

1	<i>tageng</i>	one only
2	<i>luagic</i>	
3	<i>tiliac</i>	
4	<i>acle</i>	
5	<i>lemengteng</i>	one hand
6	<i>lemengteng ngano ta</i>	
7	<i>lemengteng ngano luagic</i>	
10	<i>lemenglu</i>	
11	<i>lemenglu ngano ta</i>	
15	<i>lemenglu ngano lemengteng</i>	
16	<i>lemenglu ngano lemengteng nganu ta</i>	
20	<i>ngacsamuc teng</i>	one man
30	<i>ngac samuc teng ma nga lemenglu</i>	whole one and hands two
40	<i>ngac samuc luagic</i>	
60	<i>ngac samuc tiliac</i>	

Separate numerals for one to four are found. The word for five appears to be the same as that for hand, with the suffix *teng*, which means 'one'. Ten is 'fives two', while 15 is 'fives two and five'. Twenty was either described as 'one man' or 'fives two and fives two'. Thus there are fewer numeral words than in some other languages of the Huon Gulf Group and counting seems more closely associated with the hands. The word *treia* was given by some informants for 'three', and at first sight this would appear to be a version of the English 'three' or Tok Pisin *tripela*. However, it could merely be an alternative pronunciation of *tiliac* and related to the Proto-Oceanic **tol*.

8. BARIM

This language belongs to the Island Group of the Vitiazan Sub-Family of the Siassi Family of Austronesian languages. It is spoken in three villages on the west coast of Umboi Island. The language spoken in some villages on the north coast of the Huon Peninsula was previously included with this language, but has since been distinguished as comprising the Malasanga language (McElhanon 1984).

The following counting data were provided by an informant from Barim village:

1	<i>ta</i>
2	<i>ru</i>
3	<i>tol</i>
4	<i>pang</i>
5	<i>lim</i>

6	<i>lim be ta</i>	
7	<i>lim be ru</i>	
10	<i>sangul</i>	
11	<i>sangul be ta</i>	
12	<i>sangul be ru</i>	
13	<i>sangul be tol</i>	
14	<i>sangul be pang</i>	
15	<i>sangul be lim</i>	
20	<i>tamota</i>	man one
30	<i>tamota sangul</i>	
40	<i>tamotru</i>	
50	<i>tamotru sangul</i>	
60	<i>tamotol</i>	

One informant gave the word *dingding* for '100'. This system generally agrees with the data obtained by Chinnery on his 1926 patrol to Umboi, although his spelling differs.

9. LOKEP

This is an Island Group Austronesian language spoken in the Morobe Province in four villages on Tolokiwa Island in the Vitiav Strait, and also in the Madang Province on Long Island. The counting system proceeds as follows:

1	<i>atul</i>	
2	<i>ru</i>	
3	<i>tol</i>	
4	<i>pai</i>	
5	<i>lim</i>	
6	<i>lim be atul</i>	
7	<i>lim be ru</i>	
10	<i>sangaul</i>	
11	<i>sangaul be atul</i>	
12	<i>sangaul be ru</i>	
15	<i>sangaul be lim</i>	
19	<i>sangaul be lim be pai</i>	
20	<i>tamod</i>	man
40	<i>tamod ru</i>	

Counting can proceed then by twenties. However, there also seems to be the influence of an underlying ten-base, as some informants described '30' as *tamod tol*, '40' as *tamod pai*, instead of '60' and '80' as would be expected. Other informants described '20' as *sangaul ru*, '30' as *sangaul tol* and '40' as *sangaul pai*. The word for 'hand' in Lukep is *bene*, not related to the word for five.

10. MALASANGA

This Island Group language is spoken in three villages on the north coast of the Huon Peninsula. It was formerly grouped with Barim (No.8), but it has since been recognised that it is a distinct language (McElhanon 1984).

Counting data from an informant in Kiara village are as follows:

1	<i>ta</i>	
2	<i>rua</i>	
3	<i>tol</i>	
4	<i>pange</i>	
5	<i>bayerta</i>	hand one
6	<i>bayerta takes</i>	hand one, one and
7	<i>bayerta rukes</i>	hand one, two and
10	<i>bayer rua</i>	hands two
11	<i>bayer rua takes</i>	hands two, one and
15	<i>bayer rua bayerta</i>	hands two, hand one
16	<i>bayer rua bayerta takes</i>	hands two, hand one, one and
20	<i>kurupta</i>	man one

Lincoln (1976) in his Rai Coast survey at Malasanga village records 'five' as *bagerda* and 'ten' as *baer rua*, but otherwise the terms are very similar.

In Singorokai village an informant used the following words, indicating a considerable dialect difference.

1	<i>tanuku</i>
2	<i>dua</i>
3	<i>ton</i>
4	<i>tantan</i>
5	<i>bagera ta</i>
20	<i>kurap ta</i>

This generally agrees with Lincoln's Singorokai data.

11. MANGAP

This is an Island Group language spoken in six villages on the eastern portion of Umboi Island and the only village on Sakar Island. Data from informants were virtually the same as those collected by the government anthropologist Chinnery on a patrol in 1926 and may be summarised as follows:

1	<i>ta</i>
2	<i>ru</i>
3	<i>tel</i>
4	<i>pang</i>
5	<i>lamata</i>
6	<i>lamata mi ta</i>
7	<i>lamata mi ru</i>
10	<i>lamuru</i>
11	<i>lamuru ta</i>

15	<i>lamuru mata</i>	
16	<i>lamuru mata ta</i>	
19	<i>lamuru mata pang</i>	
20	<i>tamota</i>	man one
21	<i>tamota ta</i>	
22	<i>tamota ru</i>	
40	<i>tomtoru</i>	two men

As with previously described systems, some informants gave 'ten' as *tamota* implying some confusion between bases of ten and 20. The word for 'hand' is *nomong*, different from the word for five.

12. NENGAYA

This is a small Island Group language spoken by about 300 people in Nineia, Buala and Boneia villages on the north coast of the Huon Peninsula. Data obtained is inconsistent, with three different systems described by two of my informants and Lincoln's (1976) Rai Coast data. One informant described counting as follows:

1	<i>taininau</i>	
2	<i>lua</i>	
3	<i>lua hiliانا</i>	
4	<i>lua di lua di</i>	
5	<i>lua di lua di hiliاندانا</i>	
6	<i>lua di lua di lua di</i>	
7	<i>lua hiliاندي lua hiliاندي taininau</i>	
10	<i>laingtela laingtela suplo</i>	half half finished (2 hands)

An alternative to six was given: *lua hiliانا lua hiliانا* 'two one two one'. In this system there are only two numeral words and all higher numbers are combinations of these with ten indicated as a complete number of fingers. Another informant described a system with three numeral words:

1	<i>tainina</i>	
2	<i>lua</i>	
3	<i>tua</i>	
4	<i>luang lua</i>	2 + 2
5	<i>luang lua hiliانو</i>	2 + 2 + 1
6	<i>tuang tua</i>	3 + 3
7	<i>tuang tuang hiliانو</i>	
8	<i>umana</i>	

Hands were not used here, higher numerals being combinations of the words for two and three. *umana* was repeated for numbers above seven and appeared to mean something like more or the rest.

Lincoln's data also give the word for three, but his informants used hands and feet in counting:

1	<i>utitidzi</i>
2	<i>lua</i>
3	<i>tuwa</i>
4	<i>lua lua</i>

5	<i>lua lua hilia</i>	2 + 2 + 1
6	<i>rimara tainina kisi haitaino</i>	
7	<i>kisi lua</i>	
10	<i>rimara lua</i>	
11	<i>kisi tainina</i>	leg one
20	<i>lipu tainina kisi rimana kina</i>	hands and legs of one man

This is somewhat confusing also. The word for hand is not given at five but ten is given as 'two hands'. A third word translated as 'one' is used. Also, the word for 'leg' appears at six, earlier than would appear reasonable. It seems from the contradictions and ambiguities that the traditional system is not well known or in use as a consistent system by speakers of the language.

13. ROINJI

This language is spoken by approximately 100 people in Roinji and Darronge villages on the north coast of the Huon Peninsula, and also in the Madang Province in Gali village. Like the previous language, informants were hesitant about the counting system and gave a variety of conflicting responses indicating that the traditional system is not in use very much. All informants agreed that there were only two numerals:

1	<i>tanina</i>	
2	<i>lua</i>	
3	<i>lua ma tenina</i>	2 + 1
4	<i>lua zua lua zua</i>	

After four, some informants continued to count in twos with no further modification while others gave *dimara patena* 'one hand' for five and *dimara paten lua* 'two hands' for 10. I was unable to elicit counting as far as 20 from a number of informants on different occasions, but Lincoln (1976) records 20 as *limu tenina dimana keena* 'hands and feet of one man'.

14. SIO

This Island Group language is spoken by approximately 2,000 people in three villages in the vicinity of Sio Island off the north coast of the Huon Peninsula. The counting system described by a number of informants is as follows:

1	<i>taitu</i>	
2	<i>rua</i>	
3	<i>ngato</i>	
4	<i>ngapa</i>	
5	<i>lima</i>	
6	<i>lima kanango taitu</i>	
7	<i>lima kanango rua</i>	
10	<i>sangao</i>	
11	<i>sangao kanango taitu</i>	
15	<i>sangao kanango lima</i>	
19	<i>sangao kanango lima kanango ngapa</i>	
20	<i>tamota taitu</i>	man one

21	<i>tamota taitu kanango taitu</i>
30	<i>tamota taitu kanango sangao</i>
40	<i>tamota rua</i>
60	<i>tamota ngato</i>

Two informants only gave an expression for 100 and in each case gave *tamota sangao* which is '20 x 10' rather than *tamota lima*, or '20 x 5'. This is another example of a confusion of ten and 20 as bases.

15. TAMI

This Island Group language is spoken by about 1,000 people on the Tami Islands off the south-eastern tip of the Huon Peninsula and in Malasiga and Tamigedu villages on the mainland. The counting system obtained from a number of informants is as follows:

1	<i>te</i>
2	<i>lu</i>
3	<i>tol</i>
4	<i>pat</i>
5	<i>lim</i>
6	<i>lima timong</i>
7	<i>limalu</i>
8	<i>limatol</i>
9	<i>limapat</i>
10	<i>limandalu</i>
11	<i>limandalu ma timong</i>
15	<i>limanda lu ma lim</i>
17	<i>limandalu ma limalu</i>
20	<i>taumonde</i>
21	<i>taumonde ma timong</i>

There are separate numerals for one to five, but no word for ten. Twenty is based on the expression 'one man'.

16. GITUA

This language has recently been reclassified (McElhanon 1984) as a member of the Bariai Sub-Family, and is spoken in a single village on the north-east coast of the Huon Peninsula. The counting system has been described as follows:

1	<i>eze</i>	
2	<i>rua</i>	
3	<i>tolu</i>	
4	<i>pange</i>	
5	<i>nimanda sirip</i>	hand half
6	<i>nimanda sirip wolo eze</i>	hand half and one
7	<i>nimanda sirip wolo rua</i>	
10	<i>nimanda rua</i>	hands two

11	<i>nimanda rua wolo eze</i>	hands two and one
15	<i>nimanda rua agenda sirip</i>	hands two, leg half
16	<i>nimanda rua agenda sirip wolo eze</i>	hands two, leg half and one
20	<i>ongere eze</i>	man one
30	<i>ngero eze nimanda rua</i>	man one, hands two
40	<i>ngero rua</i>	men two
60	<i>ngero tolu</i>	men three
80	<i>ngero pange</i>	men four
100	<i>ai eze</i>	

The use of a distinct word for 100 is a notable feature here. Some informants gave 20 as *nimanda rua agenda rua*, 'hands two, legs two', while an alternative to *nimanda sirip* for 'five' was *lima*. The tally total *nimanda rua agenda rua*, 'two hands two legs' was reported to be used to equal two kina when counting money. Lincoln's (1976) data from the Rai Coast survey are roughly the same as I have obtained, except that he records 'and' as *gole* in place of *wolo*, and uses a different expression for the numerals 11 to 19, e.g. '11' *gole agenda nggangga eze*. The meaning of *nggangga* here is 'finger/toe' (Lincoln personal communication).

17. MUTU

This Bariai Sub-Family language is spoken in the original Siassi Islands, a group of small islands off the south coast of Umboi Island. The name Siassi is now used to describe the whole area including Umboi Island. There are approximately 2,000 speakers on the islands of Mandok, Tuam, Aramot, Malai and Mutu-Malau. A counting system derived from a number of informants is as follows:

1	<i>es</i>	
2	<i>ru</i>	
3	<i>tol</i>	
4	<i>pang</i>	
5	<i>lim</i>	
6	<i>lim be es</i>	
7	<i>lim be ru</i>	
10	<i>sanggul</i>	
11	<i>sanggul be es</i>	
12	<i>sanggul be ru</i>	
15	<i>sanggul be lim</i>	
16	<i>sanggul be lim be es</i>	
19	<i>sanggul be lim be pang</i>	
20	<i>tamot es</i>	man one
21	<i>tamote be es</i>	
30	<i>tamote be sanggul</i>	
40	<i>tamotru</i>	
60	<i>tamotol</i>	
100	<i>tamot lim</i>	
200	<i>tamot sanggul</i>	
400	<i>ndingnding</i>	

Some informants omitted the conjunction *be*, for example expressing '11' as *sanggul es*. Others used *ve* in place of *be*, and *sanggavul* or *sanggawul* in place of *sanggul*.

A notable feature of this system is the existence of a named higher power, in this case twenty squared. The anthropologist Alice Pomponio notes (personal communication) that this is not a recent introduction and has a practical basis, the number 20 times 20 being an adequate quantity of vines to make a large dugong net. *ndingnding* is said to be translated by informants as '100' and may be used rather loosely to mean an indefinite large number. Father Anton Mulderink, a long time resident of Mandok Island observes (personal communication) that when counting taro for a feast the following system is used. Taros are first bunched together in fives, each group of five being known as *ndir*. These bunches are then counted up to 20 making a pile known as *ndingnding*, consisting of '20 x 5' or 100 taro. These *ndingnding* may also be counted up to 20, making a pile of '20 x 20 x 5' or 2,000 taro. This bunch is considered to be enough for a good feast or *singsing* and is also known as *ndingnding*. Presumably the distinction between large and small *ndingnding* becomes apparent from the context.

18. DANGAL

This language is classified by McElhanon as belonging to the Lower Watut Sub-Family of the Adzera Family of Austronesian languages. It is spoken in three villages in the Lower Watut area. Information from a single informant in Lae is sketchy:

1	<i>takanan</i>	
2	<i>suruk</i>	
3	<i>suruk aru wangin</i>	
4	<i>suruk a suruk</i>	
5	<i>bangi takanan</i>	one hand
6	<i>bangi takanan ru wangin</i>	one hand and another
7	<i>bangi takanan ru suruk</i>	
8	<i>bangi takanan ru suruk aru wangin</i>	
9	<i>bangi takanan aru suruk a suruk</i>	
10	<i>bangi suruk</i>	

The informant could not proceed further. It appears that there are only two numerals, counting thence proceeding by addition and the use of hands. The word *wangin* seems to be a general term for 'other' rather than an alternative form of 'one'.

19. MARALANGO

This language belongs to the Lower Watut Sub-Family and is spoken by about 200 people in two villages in the Lower Watut area. No informants were contacted, and the only information available is from Fischer's ethnographic account *Watut* (1963:225).

1	<i>taganangk</i>	
2	<i>serok</i>	
3	<i>serok a wangin</i>	
4	<i>serok a serok</i>	
5	<i>nga bangge</i>	one hand

As far as it goes, this system is almost identical to that described by the informant from Dangkal. There are two numerals and counting proceeds on the hands.

20. SILISILI

This language is the third member of the Lower Watut Sub-Family, spoken in seven villages in the Lower Watut area. The only information available is from Fischer (1963:225) taken from Uruf village.

1	<i>bicits</i>	
2	<i>siruc</i>	
3	<i>siruc a bicits</i>	
4	<i>siruc a siruc</i>	
5	<i>biangke haits</i>	one hand

This is similar to the other two Lower Watut languages, with two numerals and the use of hands. However, the words used for one and two more closely resemble those of Markham Sub-Family languages. Hooley's (1971) list gives the following forms:

4	<i>seroasero</i>	
5	<i>bangki 'fatse</i>	hand
10	<i>nga bangki sero</i>	hands two

21. ADZERA

The Adzera language belongs to the Markham Sub-Family of the Adzera Family according to McElhanon's classification. It is one of the larger language groups in the province, being spoken by over 20,000 people in the Upper Markham Valley around Kaiapit. The language is divided into six separate dialects, Adzrac, Amari, Guruf, Ongac, Tsumim and Yarus spread over about 70 villages.

The counting terms used by several informants from different dialects were fairly consistent:

1	<i>bitsinta</i>	
2	<i>iruc</i>	
3	<i>iruc da bits</i>	2 + 1
4	<i>iruc da iruc</i>	2 + 2
5	<i>iruc da iruc da bits</i>	2 + 2 + 1
6	<i>iruc da iruc da iruc</i>	2 + 2 + 2

Counting higher numbers proceeds in the same manner. Some small variations were recorded. One informant described 'two' as *bisi da bisi*, while others referred to two as *irurun* 'two only'. However, there was a uniform style employing only the two numerals and not using the hands for tallying. One informant said that counting on hands had been introduced and that five could be expressed as *bangi bitsinta* 'hand one', but that this was not common. It does appear, however, in Hooley (1971), where 'five' is translated as 'hand', but 'ten' is translated not as 'two hands', but as *ampi bingan* 'a real lot'.

The limitations of this system may be overcome to some extent for certain purposes. When counting pots, names groups of four or five may be treated as units, and bunches of bananas may likewise be grouped at food presentations.

22. NGARIAWAN

This is a language of the Markham Valley Sub-Family spoken in two villages in the Leron River area. Village informants provided the following counting system:

1	<i>bisinta</i>	1 only
2	<i>iru</i>	
3	<i>iru da bits</i>	2 + 1
4	<i>iru da iru</i>	2 + 2
5	<i>iru da bits da iru</i>	2 + 1 + 2
6	<i>iru da bits da iru da bits</i>	2 + 1 + 2 + 1
7	<i>iru da iru da iru da bits</i>	2 + 2 + 2 + 1

This was as far as the informants could go. The system is virtually identical with that for Adzera. The compounds for five and six, 'two and one and two' and 'two and one and two and one' respectively are rather unusual. Like in Adzera, it appears that there are only two numerals.

23. SIRASIRA

This is a Markham Sub-Family language spoken in four villages in the Leron River area. Informants from Som and Sirasira villages provided the following data:

1	<i>tangkua</i>	
2	<i>iruk</i>	
3	<i>irikiruk ena tango mangan</i>	two and another one
4	<i>iruk da iruk</i>	2 + 2
5	<i>iruk da iruk a mangan</i>	2 + 2 + 1
6	<i>iruk a mangan iruk a mangan</i>	2 + 1 + 2 + 1

Informants were hesitant and unsure of information, and there was some prompting by a Ngariawan-speaking informant who may have influenced the responses, for example the grouping of 'two and one, two and one' for six rather than 'two and two and two'. The meaning of the expression for three is not altogether clear, but seems to mean something like 'two and another one'. Like Adzera and Ngariawan, there are only two numerals in the system described, and hands were not used.

24. SUKURUM

This Markham Sub-Family language is spoken in five villages in the Leron River area. The counting system described by informants at Sukurum village is as follows:

1	<i>bisan</i>	
2	<i>leluk</i>	
3	<i>leluk anga bisan</i>	2 + 1
4	<i>leluk anga leluk</i>	2 + 2
5	<i>leluk anga leluk anga bisan</i>	2 + 2 + 1
6	<i>leluk anga leluk anga leluk</i>	2 + 2 + 2

Further counting was said to proceed in the same manner. Like other members of this family so far described, there are only two numeral words and the hands were not used.

25. UNANK

Described by McElhanon as being spoken at Unank village west of the Markham-Leron confluence and belonging to the Markham Sub-Family. Hooley (1971) gives the following word list for the village, here called Onank:

1	<i>bicits</i>	
2	<i>siruc</i>	
3	<i>siruabits</i>	
4	<i>siruasiru</i>	
5	<i>bangke haitsi</i>	hand
10	<i>bangke haitsi babu</i>	

Thus the system has only two numeral words, after which tallying on the hands is carried out.

26. WAMPAR

This Markham Sub-Family language is spoken by nearly 5,000 people in eight villages in the Lower Markham area. The following system was compiled from data obtained from a number of informants:

1	<i>oroz</i>	
2	<i>serok</i>	
3	<i>serok oroz</i>	
4	<i>serok a serok</i>	
5	<i>bangid oroz</i>	hand one
6	<i>bangid oroz da oroz</i>	
10	<i>bangid serok</i>	hands two
11	<i>bangid serok da oroz</i>	
15	<i>bangid serok da faud oroz</i>	hands two and feet one
16	<i>bangid serok da faud oroz da oroz</i>	
20	<i>bangid serok da faud serok</i>	hands two feet two

Some informants did not use the hands at five, but continued to count in twos and ones until ten or *bangid serok* 'two hands'. The system involves only two numerals, followed by tallying. Some informants gave *ongan* in place of *oroz*.

27. WAMPUR

This is a Markham Sub-Family language spoken by about 300 people in three villages to the west of the Upper Markham. The following data were recorded by S. Holzknrecht in Wampur village:

1	<i>bisangcwa</i>	
2	<i>iriciru</i>	
3	<i>iruc a bits</i>	
4	<i>iruc a iruc</i>	
5	<i>bacin marahin sib</i>	hand half
6	<i>bacin marahin bisangcwa</i>	
7	<i>bacin a iriciru</i>	

10	<i>bangcian ditir</i>	hands altogether
11	<i>bacin ditir hagan bisangcwa</i>	hands together leg one
20	<i>garam mangan hagan a bangcian ditir</i>	man one hands and legs together

There are two alternative forms of the word for 'hand'; *bacin* and *bangcian*. The system is similar to others in the Adzera Family languages, with only two numeral words. Tallying on hands and feet takes place after four.

28. DUWET

This language, also known as Guwot, belongs to the Busu Sub-Family of the Adzera Family of Austronesian languages. It is spoken in three villages near the headwaters of the Busu River north of Lae. Informants at Lambaip village provided the following counting data:

1	<i>taginei</i>	
2	<i>seik</i>	
3	<i>seik ba ta</i>	two and one
4	<i>seik ba seik</i>	two and two
5	<i>limangga arinang</i>	hand half
6	<i>limangga arinang anau na ta</i>	hand half, another one
7	<i>limangga arinang anau na seik</i>	
10	<i>limang seik</i>	hands two
11	<i>limang seik anau na ta</i>	hands two, another one
15	<i>limang seik ambengga arinang</i>	hands two, leg half
16	<i>limang seik ambengga arinang ta</i>	
20	<i>ambeng seik limang seik</i>	hands two legs two

Thus the system involves only two numeral words and uses hands and feet to tally up to 20.

It is worth noting that informants provided a separate name for the five fingers of the hand. The names were:

<i>linan</i>	thumb
<i>geie</i>	first finger
<i>won</i>	second finger
<i>wirie</i>	third finger
<i>gan</i>	fourth finger

It is interesting to conjecture that this series could have provided the basis for a series of numerals up to five, but these words are not in fact used in counting.

29. MUSOM

This language belongs to the Busu Sub-Family and is spoken by about 300 people in two villages east of the Busu River. Village informants provided the following system:

1	<i>munuts</i>
2	<i>siluk</i>
3	<i>siluk da wen</i>
4	<i>siluk da siluk</i>

5	<i>baing lehem</i>	hand half
6	<i>baing lehem da munuts</i>	
8	<i>baing lehem da siluk da wen</i>	
10	<i>baing siluk</i>	two hands
11	<i>baing siluk da munuts</i>	
15	<i>baing siluk da hong lehem</i>	hands two and legs half
20	<i>baing siluk da hong siluk</i>	hands two legs two

The counting system has only two numeral words and uses the hands and feet to tally to 20.

30. SIRAK

This language, which belongs to the Busu Sub-Family is spoken in a single village, Banzain, which is a short distance from Boana. The language was named Nambom or Nafi by village informants who provided the following counting data:

1	<i>urus</i>	
2	<i>siruk</i>	
3	<i>siruk awen</i>	
4	<i>siruk de siruk</i>	
5	<i>baing lafen</i>	hand half
6	<i>baing lafen urus</i>	
10	<i>baing suruk</i>	hands two
11	<i>baing siruk urus</i>	
14	<i>baing siruk siruk da siruk</i>	
15	<i>baing siruk siruk da siruk da urus</i>	

Informants did not proceed to the legs, although this may take place. There are only two numerals with tallying on the hands.

31. YALU

This language is spoken only at Yalu village and is the last member of the Busu Sub-Family. I was told by a number of informants in different villages that Yalu, Musom and Sirak constitute a single language and that the dialects are mutually intelligible, but this has not been confirmed with any independent evidence. Village informants provided the following counting data:

1	<i>uruts</i>	
2	<i>siruc</i>	
3	<i>siruc aruts</i>	
4	<i>siruc siruc</i>	
5	<i>pangging lefen</i>	hand half
6	<i>pangging lefen nitsin uruts</i>	hand half and one
7	<i>pangging lefen nitsin siruc</i>	
10	<i>pangging siruc</i>	
15	<i>pangging siruc ofong menen</i>	hands two foot one
20	<i>pangging siruc ofong siruc</i>	hands two feet two

This is very similar to the previous system (Sirak) with two numeral words and using the hands for tallying. In addition the feet are used to reach 20.

32. KAPIN

This language belongs to the Buang Family of Austronesian languages. It is spoken in five villages in the Mumeng area. Village informants provided the following data:

1	<i>ti</i>	
2	<i>yu</i>	
3	<i>yal</i>	
4	<i>vei</i>	
5	<i>lim</i>	
6	<i>lima sakti</i>	
7	<i>lima sakayu</i>	
10	<i>omin</i>	
11	<i>ome tentem ti</i>	ten and one
12	<i>ome tentem yu</i>	
16	<i>ome tentem ti</i>	
20	<i>mepie ti</i>	

The information above is a little confusing. It is not clear if the word *omin* is unequivocally the numeral 'ten' or if it means something else. The linguist Linda Lauck (personal communication) considers that *gomeng pu*, alternatively used for ten means 'person above', that is the upper part of the body indicating hands complete. Likewise the meaning of the expression for '11' *onme tentem ti* is not completely clear, and although it seems to mean 'ten and one', the term for '16' is identical. While iterating the words from 11 to 15 the informants counted on the toes of the right leg, and changed to the left leg for 16 to 19, the terms for which are identical. *mepie ti* appears to mean 'one something' but the informant would only give the meaning 'hands and legs'. *kiramong* was given as an alternative to *ti* for 'one'. Lauck (personal communication) records a different system where four is given as *ba lu* or 'half', with five as *ba lu ma sek ti* or 'half and cross to one'. This appears to use the fingers of the hands without the thumbs, but the informant using this system still gave the completed hands as ten. *ba lu* is rather similar to the Mapos *lumbalu* for four meaning 'two and two'.

In summary, the system appears to have distinct numerals for one to five with the status of ten unclear. Higher numbers involve tallying on the hands and legs. There is some evidence for the alternative use of a base of four. In Hooley's (1971) lists, 'ten' is translated as *yu ming*, which seems to be two of something, possibly halves of the hands.

33. MANGA

This language of the Buang Family is spoken in eight villages in the Mumeng area. The following data were provided by village informants, and meanings and orthography checked by the linguists Joan Healy and Roma Harwick of the Summer Institute of Linguistics, who were working in the area.

1	<i>ti</i>	
2	<i>yuuh</i>	
3	<i>yaar</i>	
4	<i>yumbeyuuh</i>	two and two
5	<i>nama vaalu</i>	hand one side
6	<i>nama vaaluh windak ti</i>	hand one side and one
10	<i>nama yuuh</i>	hands two
11	<i>nama yuuh ambe windak ti</i>	hands two add and one
15	<i>name yuuh ambe windak nama vaalu</i>	hands two add hand one
20	<i>doti</i>	whole person one

Here it can be seen that there are numerals for one to three. Four is not a separate word but the expression 'two and two' is used. The expression for five means 'one hand' and hands are used thereafter to tally 'one whole person' or 20.

34. MAPOS

This is a relatively large language belonging to the Buang Family spoken by about 7,000 people in 21 villages around the Buang River area east of Mumeng. There are two dialects, Mapos and Mambump. The following data were assembled from information provided by Mapos speakers in Lae.

1	<i>ti</i>	
2	<i>lu</i>	
3	<i>lal</i>	
4	<i>lumbalu</i>	two and two
5	<i>orund vandu</i>	hand half
6	<i>orund vandu mbti</i>	hand half and one
10	<i>orundluo</i>	hands two
11	<i>orundluo mbti</i>	
15	<i>orundluo mb varang dwadu</i>	hands two, foot half
20	<i>miran dadu sti</i>	complete person one

There were considerable variations from different informants. An alternative for five was *n'madvai*, apparently meaning 'hand half', or *oronvalu*. Ten was also expressed as *orondroho* or *n'madluho*, apparently meaning something like 'hand complete'. Alternatives for 20 were *orondroho vahandroho* 'hands and legs complete' and *mahoda histi*, whose meaning is obscure.

Common to the above variations is a system with three numeral words and using the hands or hands and feet for tallying up to 20. Hooley's account of counting among the Central Buang (1978) describes a similar system proceeding as far as *mehodahis nemadvahi*, equivalent to 'five complete people' or '100'. In the same account, it is noted that a birth order series for both male and female children as far as eight is in use.

35. MUMENG

This is another large language in the Buang Family consisting of a chain of six dialects spoken by about 7,000 people in 25 villages in the Mumeng area. Counting data were provided by village informants and further information from the linguists Linda Lauck and Karen Adams has been used.

1	<i>ti</i>	
2	<i>yuu</i>	
3	<i>yon</i>	
4	<i>yuudiyuuu</i>	two and two
5	<i>vige vilu</i>	hands half
6	<i>vige bilu di sec ti</i>	hands half and cross over one
10	<i>vige yuu</i>	hands two
11	<i>vige yuu vaga yuu</i>	hands two foot one
15	<i>vige yuu vaga vilu</i>	hands two feet half
20	<i>vige yuu vaga yuu</i>	hands two feet two

Lauck states (personal communication) that there is a word for 'four' in some dialects which is *mentenau* or *mendeng*. 'Two hands' or 'ten' may be expressed *nema lu* in dialects where the word for 'hand' is *nema*. Some informants are said to give the total *gomeng* or 'one man' at ten rather than 20, and the usual expression for '20' is *kehe ti* meaning 'one base or source'. Hence '40' is expressed *kehe yuu* and there is also an expression for '100', *yul ti*, which means literally 'one bag or sack'. Lauck comments (personal communication) that for the Patep dialect, numbers one to ten and round numbers are frequently expressed in the vernacular, especially by older people, whereas Tok Pisin may be used especially by younger people and for the more cumbersome expressions.

36. PIU

This is a small Buang Family language spoken in a single village, Piu, west of Mumeng. The following counting data were provided by informants in Bulolo:

1	<i>tika</i>	
2	<i>lu</i>	
3	<i>yan</i>	
4	<i>ndalu</i>	
5	<i>vate</i>	hand one
6	<i>serkti</i>	and one
7	<i>serkalu</i>	
10	<i>serkvate</i>	and hand
11	<i>vanggilu da serkti</i>	hands two and one
15	<i>vanggilu da vate</i>	hands two and hand one
16	<i>vanggilu vangavatei tisuk</i>	
20	<i>yuka ti</i>	

At 11 the informant pointed to the toes of one leg and at 16 changed to the other leg. *yuka ti* appears to mean 'one whole man or set of digits'. Hence the system described has words for one to three, thereafter using hands and feet to tally to 20. It is not clear whether the expression for four is a distinct numeral. It is similar to the Kapin *balu* described as 'half' but could also be derived from an

expression meaning 'two and two', *lu nda lu*. Hooley's (1971) data give the expression *banggi lu* 'hands two' for ten.

37. VEHES

The last of the Buang Family languages is a small language spoken by about 100 people in a single village, Buissi, on the Buissi River south of Lae. Data from Hooley's (1971) wordlists are as follows:

1	<i>timu</i>
2	<i>uy</i>
3	<i>yar</i>
4	<i>nyekuy</i>
5	<i>nəma baru</i>
10	<i>nəma yin</i>

There are thus either three or four distinct numerals depending on whether the term for four is considered to be formed from 'two and two' or not. Words for five and ten appear to be related to hand tallying.

38. HOTE

This language belongs to the Hote Family of Austronesian languages. It is the largest of the three languages in the family, being spoken by about 1,500 people in seven villages in the mountains west of Salamaua. The other two languages in this family, Misim and Yamap, may possibly be dialects of Hote. The following information was provided by Hote speakers in Lae and supplemented by explanations by Marguerite Muzzey, a linguist working in the area.

1	<i>tom</i>	
2	<i>lokuangyu</i>	
3	<i>lokuanglu</i>	
4	<i>lokuangva</i>	
5	<i>bahengvi</i>	hand half
6	<i>bahengvi lahavu te</i>	hand half including one
7	<i>bahengvi lahavu yu</i>	
10	<i>lauming</i>	
11	<i>lauming ba lahavu te</i>	
15	<i>lauming ba lahavu bahengvi</i>	
20	<i>bungte</i>	

An alternative for one is *dongtom* meaning 'a single one' and the word *te* is used in compounds. In the expression for two to four, *lokuang* which may be omitted, appears to mean 'bone (of the finger)'. *lahavu* means 'and' or 'including'. *bungte* refers to 'one whole (person)' although the word for man is not the same. Higher numbers can be obtained from this base, for example *bungyu* for '40' or *bunglu* for '60'. It is interesting to note that the word for 'three' is *lu*. *lu* means 'two' in many Austronesian languages. The system, then, has separate numerals for one to four with a word for five meaning 'hand'. There is a separate numeral word for ten. Twenty is a completed

whole representing the tally of digits on a body. Fingers were used in counting even when distinct numerals were used which did not refer to tallying on the hands.

39. MISIM

This is a language of the Hote Family spoken by about 250 people in two villages on the north-eastern slopes of Mount Misim. The following data were collected in Lae from informants from Selebop village.

1	<i>tom</i>	
2	<i>zu</i>	
3	<i>lu</i>	
4	<i>va</i>	
5	<i>bahemvi</i>	whole hand
6	<i>bahemvi balahava tom</i>	hand whole and one
10	<i>laumin</i>	
11	<i>laumin balahava tom</i>	
12	<i>laumin balahava zu</i>	
15	<i>laumin bala bahemvi</i>	
20	<i>bongte</i>	

This is very similar to the system described for the previous language Hote. Again the expression *lokuan* may appear as a prefix in the numbers two to four, and similarly there is a separate numeral for ten and a base of 20 meaning 'one whole person'.

40. YAMAP

This Hote Family language is spoken by about 1,300 people in four villages in the mountains behind Salamaua. The following incomplete information was provided by an informant in Lae originally from Bodadum village in the Ymap area.

1	<i>tom</i>	
2	<i>yi</i>	
3	<i>lu</i>	
4	<i>va</i>	
5	<i>vagem vi</i>	one hand
6	<i>vagem vi balahava tom</i>	
10	<i>lauming</i>	
15	<i>lauming vagen vi</i>	

The informant used *vagem* for five, which means 'hand' in some of the Buang languages although he gave a different word *bahem* for 'hand' in his own language. The system is almost identical to those of Hote and Misim, with separate numerals for one to four, tallying on the hands and a separate word for ten. As with Hote, the word for 'three' is *lu*, which is more commonly found as the word for 'two' in Austronesian languages.

PART TWO: NON-AUSTRONESIAN LANGUAGES

41. KOVAI

This non-Austronesian language isolate is spoken in 13 villages on Umboi Island. Its exact taxonomic position is not clear, although McElhanon (personal communication) considers the language to be related to Huon Peninsula languages although strongly influenced by neighbouring Austronesian languages. The following counting data were provided by informants on Umboi and in Lae:

1	<i>munugon</i>	
2	<i>lolon</i>	
3	<i>albon</i>	
4	<i>ilon</i>	
5	<i>mili munugon</i>	hand one
6	<i>mili munugon manan munugon</i>	hand one and one
7	<i>mili munugon manan lolon</i>	
8	<i>mili munugon manan albon</i>	
9	<i>mili munugon manan ilon</i>	
10	<i>melalin</i>	
11	<i>melalin manan munugon</i>	
12	<i>melalin manan lolon</i>	
13	<i>melalin manan albon</i>	
14	<i>melalin manan ilon</i>	
15	<i>bab</i>	
16	<i>bab manan munugon</i>	
17	<i>bab manan lolon</i>	
18	<i>bab manan albon</i>	
19	<i>bab manan ilon</i>	
20	<i>riring</i>	
21	<i>riring manan munugon</i>	

An unusual feature here is the word *bab* for '15'. The term for five, *mili munugon* means 'one hand', but there is a separate word for ten not meaning 'two hands'. The word for 20 does not mean 'man' and appears to be a true numeral.

The word for '40' was given by some informants as *riring ilon*, whereas this would be expected to represent 80 or 20×4 . This confusion between the bases of ten and 20 is similar to that found with many of the Island Group Austronesian languages.

42. DEDUA

This language belongs to the Eastern Huon Family, and consists of northern and southern dialects spoken by about 5,000 people in 17 villages in the mountains behind the eastern coast of the Huon Peninsula. The following data are from a speaker of the South Dedua dialect:

1	<i>macgu</i>	
2	<i>jahoc kang</i>	two only
3	<i>harebec</i>	
4	<i>neakpac</i>	

5	<i>mara mong</i>	hand one
6	<i>mara mong nga mocgu</i>	hand one and one
10	<i>mara johoc</i>	hands two
11	<i>mara johoc nga mocgu</i>	
15	<i>mara johoc nga hani mong</i>	hands two and leg one
20	<i>ngic mong</i>	man one

The system thus has separate numerals for one to four, and five is expressed 'one hand'. Hands and feet are used to tally to 20. Twenty may also be expressed *ngi moc* or 'man one'.

43. KÂTE

This language of the Eastern Huon Family was chosen by the Lutheran Mission to be the lingua franca among speakers of non-Austronesian languages. It is spoken by about 25,000 people as a first language in about 30 villages north of Finschhafen. Of the five dialects listed by McElhanon (1984), all except Wemo are virtually extinct. Renck (1977a:844) notes that at the time of its adoption, the Wemo dialect had only 600 speakers, but is now used actively by about 75,000 people, with another 40,000 or so with a passive knowledge.

The following data from the main dialect were assembled from information provided by a number of informants.

1	<i>moc</i>	
2	<i>yayahec</i>	
3	<i>yaheamoc</i>	two and one
4	<i>yahec a yahec</i>	two and two
5	<i>memoc</i>	hand one
6	<i>memoc a moc</i>	hand one and one
10	<i>me yayahec</i>	hands two
15	<i>me yaheamoc</i>	
20	<i>me yahe a yahec</i>	

Alternatively, 15 was expressed *me yayahec a kike moc* or 'hands two and leg one'. The system has only two numeral words, and thereafter uses simple addition of these and tallying on the hands and feet.

44. KOSORONG

This Eastern Huon language is spoken in five villages in the Rawlinson Range south of Pindiu. The traditional system was described by a number of informants:

1	<i>motongo</i>	
2	<i>woic</i>	
3	<i>karong</i>	
4	<i>nemumgac</i>	
5	<i>boromong</i>	hand one
6	<i>boromong ano motongo</i>	hand one and one
7	<i>boromong ano woic</i>	
10	<i>borowoic</i>	hands two

15	<i>borowoic ano kanamong</i>	hands two foot one
20	<i>ezamong</i>	man one

Higher numbers can be expressed as multiples of the tally total, for example 80 is expressed *eza nemungac iyonoc kana boro* or 'four men's hands and feet'. The word *mera* meaning 'side' or 'half' is sometimes added, for example 11 is *boro woic ano kana mera mong* or 'hands two and leg one'. An alternative form of *karong* was given as *karowong*. Some informants did not use a distinct numeral for four, but expressed it *karong mong*, that is 'three one'. One informant expressed four *kembong pa*, meaning 'thumb without', which appears to have been borrowed from the Kube or Yaknge language. Thus there are three or four numeral words and tallying on the hands and feet.

An interesting alternative system was described which seems to be an adaptation of the introduced decimal system:

1	<i>wankembing</i>
2	<i>tukembing</i>
3	<i>tirikembing</i>
4	<i>fololo</i>
5	<i>faingambe</i>
6	<i>sapsap</i>
7	<i>tepelonga</i>
8	<i>hetewe</i>
9	<i>heneroka</i>
10	<i>hetening</i>
11	<i>henareka</i>
12	<i>henembing</i>
13	<i>nemungawong</i>
14	<i>henaru</i>

The earlier numerals are clearly related to the English words, while for others derivations are obscure, especially above ten. This is one of the few examples of vernacular adaptations of English-based numerals encountered.

45. KUBE

This language, also known as Hube, belongs to the Eastern Huon Family and consists of two dialects spoken by about 6,000 people in 25 villages in the Pindiu area. The following counting data were obtained from village informants speaking the Yoanggeng dialect:

1	<i>mocmagu</i>	
2	<i>erehec</i>	
3	<i>harewec</i>	
4	<i>kembong kpac</i>	thumb without
5	<i>meramong</i>	one hand
6	<i>meramong zema mocmagu</i>	one hand and one
10	<i>mera erehec</i>	
15	<i>mera harewec</i>	
20	<i>mera kembong kpac</i>	

Slight variations were recorded for the Kurungtufu dialect. Instead of *erehec*, two was given as the cognate *uluhu* and five or 'one hand' as *mulamung*. Six was expressed as *nuwu ema momago* which appears to mean something like 'one on the other side', and 20 was expressed *imang susu*, or 'one man complete'. Forty was expressed *uluhu iora hana mula* or 'hands and feet of two men'.

Both dialects show a similar system with numerals for one to four and tallying on the hands. The words for two, *erehec* and three, *harewec* are cognate with the Selepet *yogop* and *kalimbu* respectively. Some informants used *gehec nga mong* 'two and one' for three and *gehec nga gehec* 'two and two' for four.

46. MAPE

This language belongs to the Eastern Huon Family and is spoken by about 5,000 people in about 20 villages west of Finschhafen. There are two main dialects. The following counting data were from informants from the Fukac dialect:

1	<i>moketong</i>	
2	<i>yoyoka</i>	
3	<i>yokaomo</i>	two and one
4	<i>yokaoyoka</i>	two and two
5	<i>memoketong</i>	one hand
6	<i>memo a mo</i>	hand one and one
10	<i>meyoyoka</i>	hands two
11	<i>me yoyoka a mo</i>	
15	<i>me yoka a mo</i>	
20	<i>me yoka o yoka</i>	

Alternatives were as follows:

15	<i>meyoyka kifuo mobu</i>	hands two leg one whole
20	<i>ngi mobu</i>	man whole

Both systems involve only two distinct numerals and use the hands for tallying to 20.

47. MIGABAC

The two dialects of this Eastern Huon Family language are spoken in six villages between the Tewae and Masaweng rivers north of Finschhafen. The following information appears to be from the northern dialect:

1	<i>moniang</i>	one only
2	<i>yaekang</i>	two only
3	<i>habakang</i>	three only
4	<i>yahe nga yahe</i>	two and two
5	<i>molemoni</i>	hand one
10	<i>mole yaekang</i>	hands two
15	<i>mole yahe hige moni</i>	hands two leg one
20	<i>ngi mone buc</i>	man whole one

Alternatives for 20 were *mole yae na yae* 'hands four' or *hige mole* 'hands and feet'. There are three numeral words, and hands and feet are used in tallying.

48. MOMARE

This is an Eastern Huon Family language spoken in only two villages in the Masaweng River area north of Finschhafen. Village informants provided the following counting data:

1	<i>mongkeangka</i>	one only
2	<i>yaekang</i>	two only
3	<i>araboa</i>	
4	<i>iforec</i>	
5	<i>me mo</i>	one hand
6	<i>icne mo</i>	more of it, one
10	<i>me yahe</i>	two hands
20	<i>nyi mabu</i>	one man

The information given contained some gaps, but it can be seen that there are four distinct numerals, and tallying on the hands takes place, with a total of 20 at 'one man'.

49. SENE

Fewer than ten people are thought to speak this language of the Eastern Huon Family. They live at Lakona village north of Finschhafen, which is now almost entirely Kâte-speaking. An old man in the village gave the following counting data:

1	<i>moko</i>	
2	<i>yakeko</i>	
3	<i>korobo</i>	
4	<i>kiwele</i>	
5	<i>memo</i>	hand one
6	<i>memo o mo</i>	hand one and one
10	<i>meyake</i>	hands two

The informants gave *yakeo yake* as an alternative for four, meaning 'two and two'. Although the information is not complete, it can be seen that there are three or four distinct numerals with tallying on the hands.

50. BURUM

This language belongs to the Western Huon Family and is spoken by about 3,000 people in 16 villages in the Upper Mongi area of the Rawlinson Mountains near Ogeranang. The following counting data were assembled from information provided by a number of informants:

1	<i>mohot</i>	
2	<i>yahat</i>	
3	<i>karambut</i>	
4	<i>kihiwet</i>	
5	<i>boro mohot</i>	hand one

10	<i>boro yahat</i>	hands two
15	<i>boro yahat kana mohot</i>	hands two leg one
20	<i>azi mohot</i>	

There was considerable variation in the information provided by different informants. Instead of the distinct numeral *kihiwet* for four, some informants gave *yahat aka yahat* or 'two and two', while one gave *birikun kwagep*. The meaning of the latter expression is not clear, but *biri* means 'hand', and it seems to be a subtractive expression like 'hand minus one'. Some informants gave five as *burukun*, and 20 as *azi ipen mohot* 'one man finished' or *biri yahat aka kana yahat* 'hands two and legs two'. In summary, there are either three or four distinct numerals, followed by tallying on the hands and feet. The word *kihiwet* 'four' is cognate with expressions for 'four' in other Western Huon languages, for example Komba *kimembut*, Timbe *imbot*.

51. KINALAKNA

This Western Huon Family language is spoken only at Kinalakna village in the mountains behind the Sialum coast. Village informants provided the following counting data:

1	<i>kutam</i>	
2	<i>ikop</i>	
3	<i>ikop so ngolo</i>	two and one?
4	<i>ikop so ikop</i>	two and two
5	<i>holi nembat</i>	hand half
6	<i>holi nembat kutam</i>	
10	<i>holi nembat nembat</i>	hand half half
11	<i>kea kutam</i>	leg one
15	<i>kea kutam</i>	leg half
16	<i>kea nembat kutam</i>	leg half one
20	<i>kea nembat nembat</i>	leg half half

The meaning of the expression for three is not altogether clear, but it seems to be composed of two and something else, presumably another one. If so, there are only two distinct numerals, with the use of the hands and legs for tallying to 20.

52. KOMBA

Five dialects of this Western Huon language are spoken by about 12,000 people on the northern slopes of the Cromwell Mountains in the Huon Peninsula. Information was collected from a number of informants, and proved to be unusually consistent. Informants in different areas could write the complete system using a standard orthography and almost identical spelling. This is unlike many other areas visited. Data were checked and further explanations of the derivation of some terms were given by the linguist N. Southwell who was working in the area. The counting systems emerge as follows:

1	<i>kanok</i>
2	<i>zogat</i>
3	<i>karambut</i>
4	<i>kimembut</i>

5	<i>betnambut</i>	hand half or side
6	<i>namburan kanok</i>	at the other side one
9	<i>namburan kimambut</i>	
10	<i>bazagat</i>	two hands
11	<i>kin kanok</i>	
15	<i>kin nambut</i>	leg half
16	<i>kin nambut kanok</i>	
20	<i>a kanok</i>	man one

In place of the shortened form *bazagat* for ten some informants used *bet zagat* 'hands two' or *bet nambut nambut* 'hand side side'. Southwell (personal communication) reports the use of the word *mamim*, meaning 'thumb' for five. The system thus involves four distinct numerals with tallying to 20 on the hands and feet.

53. KUMUKIO

This language belongs to the Western Huon Family and is spoken in two villages in the mountains behind the Sialum coast on the north-east of the Huon Peninsula. An informant in Lae provided the following data:

1	<i>tauc</i>	
2	<i>kosop</i>	
3	<i>karembot</i>	
4	<i>ikosop so ikosop</i>	2 + 2
5	<i>suli nambat</i>	hand half
10	<i>suli nambat nambat</i>	hand half half
11	<i>suli nambat nambat kea tauc</i>	hand half half leg one
20	<i>ke suli pisuk</i>	legs hands together
40	<i>azap ikosop</i>	men two

Thus the system employs three numerals and hands and feet to tally to a total of 20 or one man.

54. MESEM

This language of the Western Huon Family is also known as Momolili, and is spoken in nine villages in the western portion of the Rawlinson Mountains north-east of Lae. A village group provided the following counting data:

1	<i>kweji</i>	
2	<i>jeba</i>	
3	<i>tuba</i>	
4	<i>babumba</i>	
5	<i>bainimbeke</i>	hand half
6	<i>bainimbeke kwe</i>	
10	<i>bainimbegere baje dalang</i>	hands finished
11	<i>bainimbegere baje dalang kagara kweji</i>	hands finished, foot one
20	<i>amorat kweji</i>	man one

There were some gaps between ten and 20, but the system appears to be one with four distinct numerals and using hands and feet to tally to 20.

55. NABAK

This language belongs to the Western Huon Family and is spoken by nearly 10,000 people in villages on the southern slopes of the Saruwaged Mountains north of Lae. The following counting data were provided by village informants and checked by the Summer Institute of Linguistics linguist E. Fabian, who was working in the area.

1	<i>kwep</i>	
2	<i>zut</i>	
3	<i>tuk</i>	
4	<i>zulazulak</i>	two and two
5	<i>bet nambet delang</i>	hand half finished
6	<i>bet nambet dalang nembet galen kwep</i>	hand half finished, this one, one
10	<i>bet duk delang</i>	hands fingers finished
11	<i>bet duk delang set galen kwep</i>	hands fingers finished, foot this one, one
15	<i>set nambet delang</i>	foot half finished
20	<i>set bet duk delang</i>	feet hands digits finished

There are three distinct numerals only, and tallying on hands and feet gives a base of 20. In addition, there is a series of birth order names, similar to that described for the Mapos language (No.33).

56. NOMU

This language belongs to the Western Huon Family. It is spoken in five villages around the Suparo River in the north-east of the Huon Peninsula. The following counting data were provided by a high school student:

1	<i>wetku</i>	
2	<i>okop</i>	
3	<i>okop so wetku</i>	two and one
4	<i>okop so okop</i>	two and two
5	<i>mete wetku</i>	hand one
10	<i>mete okop</i>	
15	<i>mete karebot</i>	
20	<i>mete okop so okop</i>	

The meaning of the expression for 15 is not entirely clear, but appears to mean 'three hands'. Although three was translated as *okop so wetku* 'two and one', the word *karebot* used in the expression for 15 is very similar to the word for 'three' in other Western Huon Family languages, for example Burum, Komba and Yaknge (*karambut*) and Sialum (*karamba*). The informant did not seem to have a clear idea of the system, as for example the expression for 20 *mete okop so okop* was identical with that given for 12. However, it appears that the system has only two numerals and tallies on the hands to reach 20.

57. ONO

Two dialects of this Western Huon Family language are spoken by nearly 5,000 people in 28 villages in the north-eastern region of the Huon Peninsula. The following data were provided by high school students, and additional information is from the Summer Institute of Linguistics linguist Tom Phinnemore who was working in the Ono area.

1	<i>weku</i>	
2	<i>etke</i>	
3	<i>karewe</i>	
4	<i>etke so etke</i>	
5	<i>mete mane</i>	hand one
6	<i>mete mane so weku</i>	
10	<i>mete etka</i>	hands two
11	<i>mete etke so kie maneo weku</i>	
15	<i>mete etke so kie maneo korop</i>	hands two foot one finish
20	<i>ngei mane korop</i>	man one finished

An alternative for 20 is *ngei mane kie mete korop* 'man one feet and hands finished'. There are three distinct numerals, and a base of 20 is achieved by tallying on the fingers and toes.

58. SELEPET

This language belongs to the Western Huon Family and is spoken in 17 villages in the Kabwum area on the northern slopes of the Huon Peninsula. The following counting data were provided by village informants:

1	<i>konok</i>	
2	<i>yogop</i>	
3	<i>maik</i>	
4	<i>imbot</i>	
5	<i>botnombot</i>	hand side or half
6	<i>botnombot lon konok</i>	
10	<i>botnombot nombot nierek</i>	hand half half finished
11	<i>koi yon konok</i>	one on the foot
15	<i>koi yon nombot</i>	foot half
20	<i>lok konok kerek</i>	one whole man

The meanings of the expression were not clearly stated and the translations given here are tentative only. There were some variations from different informants. In the North Selepet dialect *kalambu* was used for three. Other informants used *bot numburok harok* for ten, which seems to mean 'hands together'. In spite of different tallying circumlocutions, the systems all involved the use of four distinct numerals and the use of hands and feet to make a base of 20. *numburok* was also used for five, while in the northern dialect, *mome* 'thumb' may be used.

59. SIALUM

This Western Huon Family language is spoken by about 600 people in three villages on the north-eastern coast of the Huon Peninsula. The following counting data were provided by a high school student.

1	<i>wengetene</i>	
2	<i>etka</i>	
3	<i>karamba</i>	
4	<i>etka ko etka</i>	two and two
5	<i>metamu</i>	hand
6	<i>metamu ko wengetene</i>	hand and one
10	<i>meta etka</i>	hands two
15	<i>meta karamba</i>	
20	<i>kenga etka</i>	feet two

The system described has three distinct numerals and uses hands and feet to tally up to 20.

60. TIMBE

The Timbe language belongs to the Western Huon Family and is spoken by about 11,000 people in 35 villages on the northern slopes of the Saruwaged Ranges west of Kabwum. There are four recognised dialects. A number of informants contributed information and this was supplemented by observations from the Summer Institute of Linguistics linguist M. Foster who was working in the Central dialect area. The following is a typical counting system:

1	<i>konok</i>	
2	<i>lauwo</i>	
3	<i>olowu</i>	
4	<i>imbot</i>	
5	<i>momerok</i>	thumb only
6	<i>bot biken konok</i>	hand one side one
10	<i>bot bip bip harok</i>	hand side side all
11	<i>keion konok</i>	one on the foot
15	<i>keion momerok</i>	foot five
20	<i>luak konok harok</i>	man one whole

Hands and feet are used to tally to 20 and there are four distinct numerals at least. For five, the word *momerok* is used, which is not the same as the word used for 'hand', *bot*, but means 'thumb only'. The word for four, *imbot* shows some similarity to the word for 'hand', *bot*, possibly indicating that it is derived from a subtractive term such as 'hand minus', or indicating the existence of a base of four at some time. It is noted in passing that the terms for two and three appear to bear some similarity to those words in some Austronesian languages, for example in Gitua, 'three' is *tolu*, while in Siboma 'two' is *lua*.

61. TOBO

The Tobo language belongs to the Western Huon Family. It is spoken by about 3,000 people in eight villages in the Upper Mongi area on the southern slopes of the Cromwell Range. The following counting data summarise information from a number of sources:

1	<i>mogok</i>	
2	<i>reget</i>	
3	<i>karewet</i>	
4	<i>kembem kpagap</i>	thumb without
5	<i>maraman</i>	hand one
6	<i>maraman mogok</i>	
10	<i>mara reget</i>	hands two
15	<i>mara reget kana mogok</i>	hands two feet one
20	<i>kana yagat zama mara yagat</i>	feet two hands two

An alternative for 20 was *mera kembem bagap* or 'hands four'. One informant gave five as *kembo ma*, whose meaning is not clear, but may refer to the thumb as a tally total for one hand.

62. YAKNGE

This Western Huon language is spoken in 11 villages close to Pindiu. Village informants provided the following counting data:

1	<i>mohokung</i>	
2	<i>weit</i>	
3	<i>karambut</i>	
4	<i>kimbam parup</i>	
5	<i>birikun</i>	hand half
	or <i>naman</i>	
6	<i>biri bara mohokung</i>	
10	<i>biri weit</i>	
11	<i>gem kana mohokung</i>	
15	<i>gem kana naman</i>	
20	<i>kana biri yomu</i>	

Alternate expressions were recorded, for example for 16 expressions given were *angam nambat ni biri kun* or *gem kana angam likep kup weit*. These appeared to be alternative ways of expressing the addition of the digits of the fingers and toes. The base here is a tally total of 20 derived from fingers and toes, as with other members of the language family. There appears to be a word for 'five', *naman*, but it is not clear if this is a true numeral or an expression indicating that half a hand is finished. Again the expression for four suggests that a base of four could have been in existence, but it is likely to be an expression meaning 'without the thumb'. Informants noted that in former times tallies of bundles of sticks or dogs teeth were kept as a record of important numbers.

63. FINUNGWA

This language belongs to the Erap Family, and is spoken in two villages in the Lowai area west of Boana. The following counting data were obtained from village informants:

1	<i>kobelak</i>	
2	<i>yalambok</i>	
3	<i>yala kobok</i>	two one
4	<i>yale yale</i>	two two
5	<i>yale yale kobok</i> or <i>mem gonggom</i>	half finished
6	<i>kai kusani kobelak</i>	hand half one
7	<i>kai kusani yalambok</i>	
10	<i>kai kusani fengec</i>	hand halves together

There are only two numeral words, and tallying proceeds on the hands.

64. GUSAN

This language belongs to the Erap Family, and is spoken in five villages on the southern slopes of the Saruwaged Range west of Boana. The following counting data were obtained from village informants:

1	<i>kobogen</i>	
2	<i>yare</i>	
3	<i>yare kuboc</i>	two one
4	<i>yarewə yarewə</i> or <i>imaninamo</i>	two two
5	<i>iman</i>	
6	<i>kaiwi kuboc</i>	(other) hand one
10	<i>kuman ta</i>	together

The word *iman* for five appears to mean 'hand', although *kairi* was given for 'hand'. The alternative form for four *imaninamo* may mean something like 'hand nearly complete', although the meaning is not clear, and this is another example of a special term for four. Apart from this, there are only two numeral words and hands are used as tallies. The resemblance between *iman* and the word for 'hand' in certain Austronesian languages is striking, for example Siboma *nima*, Bukaua *lim*, Sio *lima*.

65. MAMAA

This language of the Erap Family is only spoken at Mamaa village west of Boana. The following counting data were obtained from village informants:

1	<i>ningalac</i>	
2	<i>yalambok</i>	
3	<i>yalining</i>	
4	<i>yali yali</i>	2 + 2
5	<i>yali yali ning</i>	2 + 2 + 1

The informants did not proceed further, although it is likely that traditionally hands would be used as tallies. In the system described there are only two numeral words.

66. MUNKIP

This language belongs to the Erap Family and is spoken only at Munkip village in the Erap Valley. Informants in the village stated that their language and that of Gain village in the Numanggang area were mutually comprehensible. The following counting data were obtained from village informants:

1	<i>kubugang</i>	
2	<i>lifet</i>	
3	<i>lifet kubugang</i> or <i>lifetning</i>	
4	<i>lifet yang lifet yang</i>	two and two
5	<i>lifet lifet kubugang</i>	
6	<i>kafongfa kubugang</i>	other hand one
10	<i>wa tarerak</i>	both (hands) together
11	<i>kafong wa tarerak kadak kubugang</i>	hands together, foot one
20	<i>kadak watarerak</i>	legs finished

There are only two numeral words, unless the expression for three *lifetning* is seen as a distinct numeral in its own right. It certainly appears to be derived from 'two one'. Tallying proceeds on the hands and feet to make a total of 20.

67. NAKAMA

Two dialects of Nakama are spoken in six villages in the Boana area by about 1,000 people. The language belongs to the Erap Family. The following counting data were obtained from village informants. Two versions are presented as there seem to be considerable variations.

(a) Northern Dialect

1	<i>fikanggang</i>	
2	<i>lupek</i>	
3	<i>lufeten</i>	
4	<i>lupeleng lupeleng</i>	two and two
5	<i>kafo kung</i>	hand
6	<i>kafo fa fikanggang</i>	hand and one
10	<i>kafo kunukang</i>	hands together
11	<i>kada fikanggang</i>	foot one
15	<i>kadak fagang</i>	
19	<i>kadak diding</i>	
20	<i>kadak kunulkang</i>	feet finished

This is a base 20 system using hands and legs for tallying. There are three numerals, the word for three possibly being derived from 'two and one'. An alternative for four, *diding* was used in higher combinations. Hence there are either three or four distinct numerals.

(b) Southern Dialect

1	<i>kubugang</i>	
2	<i>lifet</i>	
3	<i>difetening</i>	
4	<i>lifet e lifet</i>	two and two

	or <i>didim</i>	
5	<i>ko fagang</i>	hand half
6	<i>kofa kubugang</i>	
10	<i>ko kunukang</i>	
11	<i>ko bina kadak kubugang</i>	hands finished, leg one
12	<i>kadak lifet</i>	leg two
15	<i>kadak fagang</i>	foot half
20	<i>kadak ko nukang</i>	legs hands finished

Although the words are slightly different, the system here is identical with hand and foot tallying to 20 and either three or four distinct numerals. It is not known if the alternative word for four is a borrowing or has some other meaning. The word for three again could be derived from 'two and one'. The words used here are so similar to those used by informants from Munkip (No.65) that the possibility that these are two dialects of the same language is worth exploring.

68. NEK

This is an Erap Family language spoken as two dialects in six villages north of Boana. The following data were given by high school students in Lae.

1	<i>nogan</i>	
2	<i>tipet</i>	
3	<i>tipetkutno</i>	two and one?
4	<i>tipet tipet</i>	two and two
5	<i>kitombo</i>	hand
6	<i>kitombo nogan</i>	
10	<i>kit tombon tombon</i>	hand half half?
11	<i>kit tombon tombon t'm kesit tombo nogan</i>	hand half half and leg side one
15	<i>kit tipet t'm kesit tombon</i>	hands two and leg one

Informants were hesitant and could not provide complete data, but the system evidently involves tallying on the hands and legs, and appears to have only two numerals. The expression for three appears to be derived from 'two and one'.

69. NIMI

This Erap Family language is spoken in seven villages in the Lowai area west of Boana. The following counting data were obtained from informants in Lae.

1	<i>ningit</i>	
2	<i>yaru</i>	
3	<i>yarukuba</i>	two and one?
4	<i>yaru yaru</i>	
5	<i>kit kusang</i>	hand?, side
10	<i>kit kusang kusang</i>	hand? side side
11	<i>kit kusan kusan kayona ningit</i>	hand sides foot one

15	<i>kit kusang kusang kayyona kusangit</i>
20	<i>kit kusan kusan kayona kusan kusan</i>

Like other members of the family, this system involves tallying to 20 on the hands and feet and has two distinct numerals. The word for three appears to be composed of 'two and one'.

70. NUK

Two dialects of Nuk, an Erap Family language, are spoken in eight villages east of Boana. Data provided by village informants and students in Lae are still incomplete:

1	<i>ningeni</i>	
2	<i>tupet</i>	
3	<i>tupetni</i>	two and one?
4	<i>tupet tupet</i>	
5	<i>tupet tupetni</i>	two and three
6	<i>tupet tupet tupet</i>	
10	<i>singen</i>	
20	<i>kikeset</i>	

There were some gaps between six and ten and ten and 20. The expression for ten appeared to refer to the fingers of the hands and meant something like 'all'. Similarly *kikeset* referred to the 'toes being finished'. Hence, although data are not complete, the system is seen to tally to 20 using fingers and toes, with only two distinct numeral words. *tupetni* for three appears to be a compound of 'one' and 'two'. The term *singen* for ten may mean something like 'finished', as it is unlikely that such a system would have a separate numeral for ten, although informants could not give a definite meaning for this term.

71. NUMANGGANG

This is an Erap Family language spoken in ten villages west of Boana. There are two dialects, East and West. The following counting data come from information provided by several village informants:

1	<i>kutnung</i>	
2	<i>lufom</i>	
3	<i>lufom kutnung</i>	two one
4	<i>lufom lufom</i>	two two
5	<i>kafong ko</i>	hand
6	<i>kafong ko kutnung</i>	
10	<i>kafong lufom</i>	
15	<i>kayong ko</i>	feet two
20	<i>kayong lufom</i>	feet two

Alternative tallying expressions were given, for example for five *hafokong* 'half?' and six *deak kutnung*, which seemed to mean something like 'other side one'. Twenty can also be expressed *kayong hafokong hafokong* or 'feet half half'. There are only two numerals, three being expressed 'two one'. A base of 20 is reached by tallying on the hands and feet. A variation from Kasin village was as follows:

1	<i>kubegang</i>	
2	<i>lipet</i>	
3	<i>lipet ning ding</i>	
4	<i>lipet lipet</i>	
5	<i>kohong kubugang</i>	hand one
10	<i>kohong lipet</i>	hands two
15	<i>kohong kubugang kayang fokoning</i>	hands two feet half
20	<i>mac kubugang</i>	man one

Some words here are very similar to the Nakama language, while others are similar to the other Numanggang data. It is possible that the two languages are related by dialect chaining.

72. SAUK

This Erap Family language is spoken in two villages on the southern slopes of the Saruwageds north-west of Boana. Village informants provided the following data:

1	<i>ningit</i>	
2	<i>yali</i>	
3	<i>yalanang</i>	
4	<i>yaliya yaliya</i>	two two
5	<i>niya</i>	
6	<i>kosan ingningit</i>	half one
10	<i>kekokeko</i>	half half

The informants used hands and feet when explaining the system but the words for these do not appear. The meaning of *niya* for five is not clear. Since there are only two distinct numeral words (the expression for three appears to be a compound of two and one) it is not likely that *niya* is a true numeral but probably a term assisting in tallying. Numbers above 15 were given as 'many'.

73. URUI

This Erap Family language is spoken in 13 villages between Boana and the Leron River. Data from Lae informants are as follows. One system described was:

1	<i>kubini</i>	
2	<i>fama</i>	
3	<i>famagong kubinigong</i>	two and one
4	<i>famagong famagong</i>	two and two
5	<i>famagong famagong kubinigong</i>	
6	<i>famagong famagong famagong</i>	
10	<i>kafini trasona</i>	hands finished?
11	<i>kafini fama tanga kubini</i>	hands two and one
15	<i>kafini fama tanga kubini</i>	hands two and one
18	<i>wusap</i>	
19	<i>wasapking</i>	
20	<i>samo</i>	
21	<i>samosini</i>	

It is difficult to make much sense of these data. Counting proceeded by twos as far as ten when the hands were brought in. There were certain inconsistencies, for example the expression for 11 was identical with the expression for 15, suggesting that the data are unreliable. The expressions given for 18, 19, 20 and 21 were completely unexpected and no explanation could be elicited.

Another Urii-speaking informant provided the following data:

- | | |
|----|--------------------------------------|
| 1 | <i>kubunik</i> |
| 2 | <i>kubuniksak</i>
or <i>famak</i> |
| 3 | <i>fimeneng</i> |
| 4 | <i>fimenengging</i> |
| 5 | <i>fimenengsinik</i> |
| 6 | <i>siamoging</i> |
| 7 | <i>siamogingsinik</i> |
| 8 | <i>memeng</i> |
| 9 | <i>memengging</i> |
| 10 | <i>memenggingsini</i> |
| 11 | <i>memenggingsinik</i> |
| 12 | <i>kubunikingsini</i> |
| 13 | <i>femengsini</i> |
| 14 | <i>fimenengnisini</i> |
| 15 | <i>fimenengsini</i> |
| 16 | <i>amongingsini</i> |
| 17 | <i>siamongingsini</i> |
| 18 | <i>memengmemengingsini</i> |
| 19 | <i>memenginmemengini</i> |
| 20 | <i>memenging memenging</i> |
| 21 | <i>memengbunik</i> |

This unusual system is quite unlike anything else encountered in the Morobe Province, and needs further investigation. It is possibly an adapted version of introduced English or Tok Pisin numerals using an indigenous counting method and phonology, but the full explanation remains a mystery at present. The informant who provided the system would not elaborate.

The normal traditional system appears to be the following, obtained from Siara village:

- | | | |
|---|----------------------------------|-------------|
| 1 | <i>kubinik</i> | |
| 2 | <i>famac</i> | |
| 3 | <i>fimeneng</i> | |
| 4 | <i>famagong famagong</i> | two and two |
| 5 | <i>famagong famagong kubinik</i> | |

There appear to be three distinct numerals here, although the expression for three could be a compound of 'two' and 'one'. Tallying was said to proceed on the hands and feet.

74. BAM

This language is a member of the Wantoat Family and is spoken by about 400 people in four villages south-east of Wantoat. The following incomplete data were obtained from a high school student at Kaiapit:

1	<i>bat</i>	
2	<i>yara</i>	
3	<i>yara bat</i>	2 + 1
4	<i>yara yara</i>	2 + 2
5	<i>yara yara bat</i>	2 + 2 + 1
6	<i>yara yara yara</i>	2 + 2 + 2

The only numerals were for one and two and no further variation was given. Although no mention was made of tallying on the digits, this may occur.

75. IRUMU

This Wantoat Family language is spoken in 11 villages in the Upper Irumu River area south-east of Wantoat. Village informants provided the following data:

1	<i>kumbagangan</i>	
2	<i>yara</i>	
3	<i>yara kumba</i>	two one
4	<i>yarambok yarambok</i>	two two
5	<i>iman</i>	
6	<i>ket kutni kumbang</i>	hand? other one
10	<i>ket ketni kutni siang</i>	
11	<i>kurong ken kumbong</i>	leg one
15	<i>kuron ken iman</i>	
20	<i>ken kuron kunduk</i>	hands legs together

Unlike other members of the Wantoat Family, this system involves the use of hands and feet in tallying. The meaning of the word *iman* for five is not clear, and it may be a tallying aid, but its similarity to words for 'five' in the Austronesian languages should be noted, for example Lukep *lim*, Sio *lima*, Siboma *nima* and Gitua *nimanda* (see Gusan No.63). However, there are numeral words for only two and one apart from this.

76. WANTOAT

This is by far the largest language in the Wantoat Family. Three separate dialects are spoken by over 7,000 people in the Wantoat area. The following data were collected from village informants and high school students.

1	<i>tapatu</i>	
2	<i>tapaya</i>	
3	<i>tapaya tapatu</i>	2 + 1
4	<i>tapaya tapaya</i>	2 + 2
5	<i>tapaya tapaya tapatu</i>	2 + 2 + 1

6	<i>tapaya tapaya tapaya</i>	2 + 2 + 2
10	<i>katakut musayat</i>	hands together
20	<i>katahune ta kuku bengahune</i>	hands and feet together

There are only two numerals. Hands and feet are used in tallying but informants did not count five as one hand, but continued marking off twos until ten was reached.

77. YAGAWAK

This language belongs to the Wantoat Family and is spoken in two villages south-east of Wantoat. The following incomplete data were obtained from a high school student at Kaiapit:

1	<i>kumbagan</i>	
2	<i>yala</i>	
3	<i>yalakumba</i>	2 + 1
4	<i>yalakumba kumba</i>	2 + 1 + 1
5	<i>yalakumba yala</i>	2 + 1 + 2
6	<i>yalakumba yalakumba</i>	2 + 1 + 2 + 1
7	<i>yalakumba yalakumba kumba</i>	2 + 1 + 2 + 1 + 1
10	<i>yala yala yala yala yala</i>	2 + 2 + 2 + 2 + 2

The informant made no attempt to tally, even though asked for the words for hand and foot. The numbers were grouped in twos and ones except for ten, where only twos were used. This is rather similar to the previous language Wantoat, where fingers were marked off in twos until two hands were recorded.

78. UFIM

The Ufim language is the only member of the Gusap-Mot Family in the Morobe Province, the remainder being spoken in the Madang Province. Ufim is spoken by about 500 people in five villages in the Upper Umi and Ufim River areas north of Kaiapit. The following counting data are from informants in Lae:

1	<i>kwana</i>	
2	<i>irisa</i>	
3	<i>kapusa</i>	
4	<i>niming kining</i>	
5	<i>kande kwa</i>	hand one
10	<i>kande irisa</i>	hands two
15	<i>kande kapusa</i>	hands three
20	<i>kande niming kining</i>	hands four

There are distinct numerals for the numbers one to four, while five is expressed 'one hand'. The use of feet may have taken place traditionally, but only hands were mentioned by these informants.

79. BONKIMAN

This language belongs to the Yupna Family, which is spoken mainly in the Madang Province. In the Morobe Province, Bonkiman is only spoken in the village of Yuwong on the north coast of the Huon Peninsula near the Madang border. The following data were obtained from a village informant:

1	<i>isan</i>	
2	<i>bronge</i>	
3	<i>kabe</i>	
4	<i>mbrong mbrong</i>	two and two
5	<i>mbrong mbrong kagne</i>	
6	<i>kolom kuwo isan</i>	hand another? one
7	<i>am brong</i>	and two
8	<i>kabe na</i>	three more
9	<i>tauam kuwok kamkam</i>	

The meaning of the expression for nine is not clear, but is probably an expression for the coming together of the fingers of two hands which should have appeared at ten. The informant was very hesitant and needed a great deal of prompting to obtain the above information. There appear to be three distinct numerals with the use of hands to tally further.

80. ISAN

This is the second language of the Yupna Family to be spoken in the Morobe Province, and it is sometimes known as Yupna. Within the Province it is spoken at two villages in the mountains just east of the Madang Province border. Information was obtained from informants in both villages to give the following data:

1	<i>esal</i>	
2	<i>brong</i>	
3	<i>kape</i>	
4	<i>brongə brongə</i>	
5	<i>kodom kanda</i>	hand half
6	<i>kodom kanda kopok brong</i>	hand half side one
10	<i>kodom brong</i>	
15	<i>kodom brong kaipe kopok konda</i>	hands two leg one side
20	<i>kaipe brong kodom brong</i>	feet two hands two

One informant gave the word *upu* meaning 'big toe' when 20 was reached, but it is not clear if this is a commonly understood expression for 20. The system has three distinct numerals and tallying on hands and feet gives a base of 20.

80A. KORIPON

McElhanon (1984) includes the village of Koripon in the Yupna language area but notes that its status is not confirmed. Informants at Koripon stated that their language is not the same as that of neighbouring Bungavot (Yupna language) but is similar to Darronge, the language of a group living with Roinji speakers at the coast in Roinji village. I could not confirm this with lexicostatistical evidence, but the counting data provided by Koripon informants is quite different from both Yupna

and Roinji, and the language is thus given a separate status here. The Koripon word for three appears to be cognate with that of the Yupna, Bonkiman and Som languages. The following counting data were provided by informants in the village:

1	<i>duwit</i>	
2	<i>kumjat</i>	
3	<i>kapu</i>	
4	<i>kumnaket kumnaket</i>	two two
5	<i>korundo</i>	hand
6	<i>kutet duwit</i>	half one
10	<i>korun kumjat</i>	
11	<i>kai kutet duwit</i>	leg half one
15	<i>kai kutet du</i>	leg half finished
20	<i>kai orun kumgum</i>	hands legs together

There are three numeral words. Tallying on the hands and feet gives a base of 20.

81. KOMUTU

This language belongs to the Uruwa Family and is spoken in six villages on the north coast of the Huon Peninsula west of Wasu. Village informants provided the following data:

1	<i>kamantewe</i>	
2	<i>yarə</i>	
3	<i>kaləhu</i>	
4	<i>yarənə yarənə</i> or <i>yarə nuknuk</i>	
5	<i>get kamandauk</i>	hand one half
6	<i>get num kaman</i>	hand half and one
10	<i>get numnum</i>	hands together
11	<i>halambeng kamang</i>	leg one on
15	<i>halambeng daup</i>	leg half
20	<i>amna kaman dauk</i>	man one altogether

An alternative for five was *kawan tabi*, whose meaning is not known. The two meanings for four are probably similar, meaning 'two and two' or 'twice two'. An alternative for six was *kaləhu* or 'three three'. In summary the system has three distinct numerals and uses the hands and feet to tally to 20.

82. SAKAM

This language belongs to the Uruwa Family and is spoken by about 500 people in the Upper Uruwa area of the Huon Peninsula. The following data were obtained from informants at Makua village:

1	<i>kuwaran</i>	
2	<i>danggan</i>	
3	<i>kailpu</i>	
4	<i>danggan danggan</i>	two two

5	<i>kaibue kuwoku</i>	hand side
6	<i>paijang kuwe</i>	?other side one
10	<i>kaibukuo kumen kaibukuo kumen</i>	hand finished hand finished
11	<i>tailma kuwe</i>	nose one
12	<i>tailma dangge</i>	nose two
13	<i>koljang kuwoku kuwe</i>	leg on one
17	<i>koljang kuwoku kumen</i>	leg side finished
22	<i>koljang kulmen</i>	legs finished

A most unusual feature of this system is the incorporation of the nostrils for tallying. The informant first counted on the fingers of the left hand which was clenched with the thumb up. This was repeated with the right hand. The left thumb was then placed on the left nostril followed by the right thumb on the right nostril. This is the only case so far encountered in the Morobe Province of the use of any parts of the body apart from the hands and feet as counting aids. Informants at Dinanggat did not use this but could only provide a tally up to ten on two hands when asked. There thus appears to be tallying on the hands, nose and feet, and there are three distinct numeral words.

83. SOM

This member of the Uruwa Family is spoken only at Gorgiok village in a remote area of the Upper Som Valley. The following counting data were obtained from informants in the village:

1	<i>koweran</i>	
2	<i>yarə</i>	
3	<i>kabmə</i>	
4	<i>oyarə oyarə</i>	two two
5	<i>oyarə oyarə kowe</i>	two two one
6	<i>okabmə okabmə</i>	three three
7	<i>okabmə okabmə kowe</i>	

Counting proceeded in a similar fashion, adding further numbers in threes. There was no attempt made to use either the hands or feet to tally. There are three distinct numeral words.

84. WELIKI

This language is a member of the Uruwa Family and is spoken by about 200 people living near the north coast of the Huon Peninsula west of Wasu. The following counting data were recorded from Hiom village:

1	<i>kongotai</i>	
2	<i>eleko</i>	
3	<i>olowu</i>	
4	<i>eleko ngomba eleko</i>	two and two
5	<i>meme bisuk</i>	hand finished
6	<i>isin biknganggin kongotai</i>	side half one
10	<i>isin birim birim bisuk</i>	both hands finished
11	<i>aputen kongotai</i>	leg one

15	<i>aput biknge bisuk</i>	leg half
20	<i>aput birim birim bisuk</i>	legs together

This system employs tallying to a base of 20 and has three distinct numerals. There appears to have been some influence from the Timbe language, for example the use of *olowu* for 'three' and *biknge* for 'half'. The word *meme* appears to mean 'hand', while the expressions used from six to ten describe the tallying process.

85. YAU

The largest of the Uruwa Family languages in the Morobe Province, Yau is spoken in 11 villages on the northern slopes of the Saruwaged Ranges in the Sapmanga area. The following counting data were obtained from village informants:

1	<i>ongkogon</i>	
2	<i>yait</i>	
3	<i>atvi</i>	
4	<i>anumuno</i>	
5	<i>obu kaimang</i>	hand ?side
6	<i>obu hong ohe bigu</i>	hand ?half and one
7	<i>obu ohe yait</i>	hand and two
10	<i>obu yait yait</i>	hand two two (together)
11	<i>obu yait yait botengga orun bigu</i>	hands together leg one
15	<i>obu yait yait botengga orun ohema</i>	hands together, leg half
20	<i>orun obu yait yait boteca</i>	two hands legs finished

This is a straightforward system of tallying on the hands and feet to make a total of 20. There are four distinct numeral words.

86. WASEMBO

This language belongs to the Pihom Stock of the Madang and Adelbert Range Sub-Phylum, which is spoken mainly in the Madang Province. In the Morobe Province it is spoken in five villages in the Upper Ramu area near the border with the Madang Province. The following incomplete data were obtained from a high school student at Kaiapit:

1	<i>harawo</i>	
2	<i>abugi</i>	
3	<i>abono</i>	
4	<i>abugi abugi</i>	two two
5	<i>abugi abono</i>	three two
6	<i>abono abono</i>	three three
7	<i>abono abono harawo</i>	three three one

There was no attempt to use the hands to tally, and there are three distinct numerals.

87. WAFFA

This language is the only Morobe representative of the East New Guinea Highlands Stock, and belongs to the Eastern Family. It is spoken in five villages in the mountains to the west of the Markham River close to the border with the Eastern Highlands Province. The following data were provided by the Summer Institute of Linguistics linguist, Mary Stringer who has lived and worked in the area for many years. They are presented in the orthography she has devised for the language:

1	<i>mmuaa-vai</i>	
2	<i>taara-vaitana</i>	
3	<i>taara-vooma</i>	
4	<i>taara-ma taara-ma</i>	two two
5	<i>yaaku sai-vai</i>	hand half
6	<i>yaaku sai-vai sai-nai-diri mmuaa-vai</i>	hand half, new half one
10	<i>yaaku-u-raitana</i>	hands two
11	<i>yaaku-u-raitana yuku-ki-diri mmuaa-vai</i>	hands two foot one
15	<i>yuku sai-vai</i>	feet half
20	<i>yuku yaaku taika kioo or mmuaa vaidi-vai</i>	feet hands finished

An alternative form for five is *eera-ivo* which is the name for the 'little finger'. The system uses tallying on the hands and feet to make a base of 20, and there are two distinct numerals. The expression for three appears to be derived from 'two and one'.

88. AGAATAHA

This language belongs to the Angan Family and is also known as Langimar. It is spoken in the Langimar River area west of Bulolo. A village informant provided the following data:

1	<i>nanso</i>	
2	<i>yokwu</i>	
3	<i>mulumo</i>	
4	<i>mulə mulə</i>	
5	<i>ikwi kwandere</i>	hand
6	<i>ikwi kwandere mo nanso</i>	hand and one
10	<i>ikwu maindumwu</i>	hands ?finished
15	<i>ikwu maindumu ikwi kwandere</i>	hands two and half
20	<i>ikwu aukwuru</i>	hands and feet

There are three distinct numerals and the hands and feet are used to tally a total of 20.

89. HAMTAI

This language, also known as Kapau is spoken by over 60,000 people and is thus a very large language group by Papua New Guinean standards. About 20,000 of these live in the Morobe Province in the Aseki area, while the remainder live in the Gulf Province in the Kaintiba area. Village informants provided the following data:

1	<i>fati</i>	
2	<i>hivacu</i>	
3	<i>hivacu fati</i>	two one
4	<i>hivacu hivacu</i>	two two
5	<i>hivacu hivacu fati</i> or <i>feca akapu</i>	two two one fingers all
6	<i>feca hatuanga akapu hatuanga fati</i>	hand side all side one
10	<i>feca hatuanga hatuanga</i>	hand side side
11	<i>feca akapu ianga hatuanga fatina</i>	hands finished foot side one
15	<i>feca akapu ianga hatuanga akapu</i>	foot side finished
20	<i>feca akapua nica ade ianga akapu</i>	hands and feet finished

This system is similar to the preceding one except that there are only two numerals. Some informants did not use the hands, but counted by adding ones and twos. Others used hands and feet to tally to 20.

90. KAMASA

This is an apparently dying language of the Angan Family spoken by about 20 people, mainly at Katsiong refugee village north-east of Menyamya. No field data were collected, but the following numbers were taken from word lists prepared by Lloyd (1973:548).

1	<i>hunanko</i>
2	<i>hukwego</i>

Referring to common features of Anga languages, Lloyd notes (1973:87):

Counting systems are very similar...there are words for *one*, *two* and phrases literally *two one* for three and *two two* for *four*. For higher numbers the nouns *hands* and *foot* are used.

The Kamasa counting system thus has two numeral words and appears to use the hands and feet to tally to 20.

91. KAWATSA

This is another very small Angan Family language, being spoken by about 20 people, mainly at Katsiong refugee village. A Kawatsa-speaking informant in Lae provided the following data:

1	<i>tona</i>	
2	<i>tavau</i>	
3	<i>tavau to</i>	2 + 1
4	<i>tavau tavau</i>	2 + 2
5	<i>tavau tavau to</i>	2 + 2 + 1
6	<i>tavau to tavau to</i>	2 + 1 + 2 + 1

Counting continued using only combinations of one and two. There was no attempt to tally on the hands. Lloyd (1973:549) gives the words for 'one' and 'two' as *uwa'na* and *huvaa'u* respectively.

92. MENYA

This Angan Family language is spoken by about 12,000 people in a large number of small settlements in the Menyama area. The following counting data were collected from a variety of informants, and were supplemented by comments from Summer Institute of Linguistics linguists A. Chipping and C. Whitehead who have worked in the area:

1	<i>hankwona</i>	
2	<i>hankwakwu</i>	
3	<i>hankwakwu hankwe</i>	two one
4	<i>hankwakwi hankwakwi</i>	two two
5	<i>hankwakwi hankwakwi hankwe</i> or <i>hipa hankwona</i>	hand one
10	<i>hipa ekwana</i>	hand all
20	<i>hipa suka ekwana</i>	hands legs all

Different informants gave quite a variety of pronunciation and orthography, but the systems were basically the same, with two numerals and the use of hands and feet to tally to 20. Some informants did not tally but only used the two numerals to build higher numbers.

93. SAFEYOKA

Four dialects of this Angan family language are spoken by about 3,000 people in an area north of Menyama close to the border with the Eastern Highlands Province. A variety of informants were contacted. The following data in the Ampeeli-Wojokeso dialect were provided by the Summer Institute of Linguistics linguists, D. and E. West who were working in the area:

1	<i>anga'no</i>	
2	<i>hufa'u</i>	
3	<i>hufa'u sihune</i>	
4	<i>osofo fo fa'u'no</i>	
5	<i>aho fehonjo hopi'nono</i>	hand half all
10	<i>aho hopi'nono</i>	hands all
15	<i>aho hopi'nono sife fehohnta'ni</i> <i>hopi'nono</i>	hands all foot half
20	<i>sife aho hopi'nono</i>	feet hands all

The phrases are not stereotyped, and data provided by other informants show that numbers above five were expressed quite differently by different individuals. Multiples of 20 can be expressed using this system. There appear to be only two numerals. The meaning of the expressions for three and four, are not clear, but appear to be compounds of one and two.

94. YAGWOIA

This Angan language is spoken by about 6,000 people in the Menyama area. A number of informants gave differing information, but the systems described were similar. The following data are typical and were provided by the linguists, M.R. and H. Bowling who were working in the area. The system is presented in their orthography:

1	<i>'kwənənoi</i>	
2	<i>u'laako</i>	
3	<i>u'laangwa</i>	
4	<i>'yaako 'yaako</i>	two two
5	<i>wəlyəmpu</i>	hand
10	<i>'wəlyə'mplaako</i>	two hands
15	<i>hyulə wəlyəmpu</i>	hands and foot
20	<i>apni</i>	man

Variations for 'one' were *hekwe* or *gonangi* and for 'two' *huluwaku* or *hoku*. Some informants did not tally on hands but used combinations of the numerals one and two only. The expression for three appears to be a combination of one and two.

94A. SUSUAMI

Informants in Mangki village in the Upper Watut area described a language which they called Susuami, which did not appear to be the same as any so far described. A comparison of word lists suggests that this is an Angan Family language most closely related to Kamasa and Kawatsa (Smith forthcoming). A minority of the inhabitants of Mangki speak Susuami, the remainder speaking Agaataha. The following counting data were provided by village informants:

1	<i>pono</i>	
2	<i>penkwai</i>	
3	<i>penkwai nyi ponyi</i>	two and one
4	<i>penkwai nyi penkwai nyi</i>	two and two
5	<i>ha pesu</i>	hand half
10	<i>ayemu kwao</i>	
15	<i>ayemu kwao ha pesu</i>	
20	<i>ukwamu hamo kwekwa</i>	feet hands together

The meanings of the expressions for ten and 15 are not clear, but they appear to be phrases describing tallying. There are two numerals.

95. BIANGAI

This language belongs to the Kunimaipan or Goilalan Family and is spoken in seven villages in the Wau area. The following data were compiled from information received from informants in the villages and in Lae, and from the Summer Institute of Linguistics linguist, R. Dubert:

1	<i>nak</i>	
2	<i>nayau</i>	
3	<i>nayak keya nak</i>	two and one
4	<i>mango bek tau ono</i>	
5	<i>mere nasik</i>	hand one
6	<i>mere nasik keya nasika nak</i>	
10	<i>mere yau</i>	hands two
11	<i>mere yau keya ingi nasika nak</i>	hands two, foot one

15	<i>mere yau ingi nasik</i>	hands two leg one
20	<i>yombu nak</i>	

Information from different informants was quite constant, that is there seems to be a standard or conventional form, unlike, for example Safeyoka where there was considerable variation in the phrases used. The expression for three means 'two and one' and it would seem that there are only two numerals, but the meaning of the expression for four is not clear. This could represent the vestiges of a base four system, or it may have a meaning related to hand tallying. Otherwise this is a normal hand and foot tallying system.

96. KUNIMAIPA

This language, a member of the Kunimaipan Family, is spoken in an area straddling the border between Morobe and Central Provinces west of Garaina. There are about 1,500 Kunimaipa speakers in the Morobe Province, and somewhat more in the Central Province. The following data were provided by the Summer Institute of Linguistics linguists, J. Coleman and E. Geary:

1	<i>nap</i>	
2	<i>houlounariv</i>	
3	<i>nanariv nap</i>	two one
4	<i>nanariv nanariv</i>	two two
5	<i>maranas</i>	hand
6	<i>maranas sitihanan nap</i>	hand and one
10	<i>mar houlousikaro</i>	hands two
15	<i>marasikaro met en nas</i>	hands and foot
20	<i>abanap mumug</i>	

Coleman and Geary (personal communication) note that this system is not used very much beyond three. The suffixes appended to the numerals given in this list refer to people, but there are 17 other suffixes used as noun qualifiers. The system has two numerals and uses hands and feet to tally to 20.

97. WERI

This Kunimaipan Family language is spoken exclusively within the Morobe Province. There are about 4,000 speakers in the mountains between Wau and Garaina. The following data were compiled from information received by village informants, two dwellers and the Summer Institute of Linguistics linguist, M. Boxwell:

1	<i>nent</i>	
2	<i>nentepar</i>	
3	<i>nentepar nent</i>	two one
4	<i>kong nent</i>	fourth finger
	or <i>nentepar nentepar</i>	two two
5	<i>mor nas</i>	
6	<i>mor has nasiaan nent</i>	hand one from hand one
10	<i>moraar</i>	
	or <i>moresiar</i>	hands two
11	<i>moresiar ingesiaan nent</i>	hands two from foot one

15	<i>moresiar ing nas</i>	hands two foot one
20	<i>omenamp ulpen</i>	man whole

In this system, tallying on hands and feet achieves a total of 20. There are two numerals but an alternative name for four is used also. In place of *nent* and *nentepar* for 'one' and 'two', some informants used *nao* and *naorar*.

98. BINANDERE

This language of the Binanderean Family is spoken mainly in the Northern Province, but also in two villages on the southern coast of the Morobe Province close to the border with the Northern Province. The following incomplete data were collected from an informant at high school in Lae:

1	<i>da</i>	
2	<i>tote</i>	
3	<i>tamode</i>	
4	<i>tamode da gagani</i>	
5	<i>ingo da</i>	hand one
6	<i>ingo neida gisi</i>	
7	<i>gisida gagani</i>	
8	<i>toro nei</i>	
9	<i>ingo da paside</i>	
10	<i>aobe ao</i>	

The meanings of these expressions are not clear. Five appears to mean 'one hand', but there seem to be other words for six to ten. Clarification is needed here.

99. GUHU-SAMANE

This language is a member of the Binanderean Family and is spoken in the mountainous Upper Waria area of the Morobe Province south of Garaina. A number of informants contributed to the following data:

1	<i>tena</i>	
2	<i>eseri</i>	
3	<i>tapari</i>	
4	<i>eseri sa eseri</i>	two and two
5	<i>boto tena</i>	hand one
6	<i>boto tena ma tena</i>	hand one and one
10	<i>boto eseri</i>	hands two
15	<i>boto tapari</i>	hands three
	or <i>boto eseri ma oko te</i>	hands two leg one
20	<i>boto eseri ma oko eseri</i>	hands two feet two

There are three numerals and tallying to a base of 20 takes place on the hands and feet.

100. MAWAE

This language belongs to the Binanderean Family and is spoken by about 1,000 people in the mid-Waria region in the south of the Morobe Province. The following counting data were provided by informants in Lae:

1	<i>dekako</i>	
2	<i>eto</i>	
3	<i>etama</i>	
4	<i>etama dekaka</i>	three one
5	<i>nago dekaka</i>	hand one
6	<i>nago zora dekako</i>	hand another one
10	<i>nago eto</i>	hands two
15	<i>nago eto nago zo</i>	hands two hand another
20	<i>nago eto te eto</i>	hands two and two

The feet were not used here to tally, but a total of 20 was achieved by using four hands. There are three numerals.

101. SUENA

This is a Binanderean Family language spoken by about 2,000 people around the Morobe District headquarters. Counting data from Suena-speaking informants were supplemented by comments from the Summer Institute of Linguistics linguist, D. Wilson who was working in the area:

1	<i>da</i>	
2	<i>eta</i>	
3	<i>etorobara</i>	
4	<i>zoeto zoeto</i>	two two
	or <i>wana awa patitiro</i>	little finger bent
5	<i>wana da</i>	hand one
6	<i>wana zore wana zora gitire</i>	hand one hand one's thumb
10	<i>wana eto darapotiro</i>	hands two?
15	<i>wana etore te zore</i>	hands two foot one
20	<i>wana etore te atore</i>	hands two feet two

Wilson (personal communication) considers that *etorobara* meaning 'three' is probably derived from *eta-roba-da* or 'two plus one'. The expression for four meaning 'little finger bent' indicates that four fingers are left upright. There are two numerals, and tallying on hands and feet gives a base of 20.

102. YEKORA

This language belongs to the Binanderean Family, and is spoken in three villages close to the Morobe District headquarters. Informants in Lae provided the following counting data:

1	<i>dembaka</i>
2	<i>eto</i>
3	<i>etoremba</i>

4	<i>ikapatige</i>	
5	<i>umazo</i>	hand
6	<i>umazo ika dembaka</i>	hand and one
10	<i>uma eto</i>	hands two
15	<i>uma eto wegiti dembaka</i>	hands two and foot one
20	<i>emba zo</i>	man one

Tallying on the hands and feet gives a base of 20. There are two distinct numerals and the expression for three appears to mean 'two and one'.

103. ZIA

This language belongs to the Binanderean Family and is spoken by about 3,000 people in the Lower Waria area south of the Morobe District headquarters. The following data were provided by an informant in Lae:

1	<i>dengkaka</i>	
2	<i>eta</i>	
3	<i>etama</i>	
4	<i>singwopatige</i>	
5	<i>wangwozo</i>	hand one
10	<i>wanwo eto</i>	hands two
15	<i>wangwo eto tezo</i>	hands two foot one
20	<i>emozo</i>	man one

This is similar to other systems in the family. There are two distinct numerals and three appears to have been derived from 'two and one' but is not identical. There is a term for four which seems to be related to the Suená term meaning 'the little finger bent'. Tallying on the hands and feet gives a total of 20.

APPENDIX B

NUMERAL WORDS IN MOROBE LANGUAGES

The words used for numerals in Morobe languages are presented here for ease of comparison. It will be recalled that languages represented by numbers 1-40 are Austronesian, while 41-103 are non-Austronesian (see Appendix A). For numerals above two, expressions consisting of combinations of others words are shown by the mathematical symbols, for example '2 + 1' or '5 x 2'. When considering the number five, the words for both five and hand are compared where this information is available. If five is represented by a hand tally, this is indicated. Few languages have a distinct numeral for ten; for the others, a variety of tallying expressions may be used, indicated in the lists by 'tally total'. None of the languages have distinct terms for the numerals six to nine.

WORDS FOR 'ONE' IN MOROBE LANGUAGES

1.	<i>tigen, tikeng, tegeng</i>	5.	(no data)
2.	<i>dongke</i>	6.	<i>sesemi</i>
3.	<i>tunome</i>	7.	<i>tageng</i>
4.	<i>tugwatu</i>	8.	<i>ta</i>

- | | | | |
|-----|----------------------------|-----|--|
| 9. | <i>atul</i> | 56. | <i>wetku</i> |
| 10. | <i>ta, tanuku</i> | 57. | <i>weku</i> |
| 11. | <i>ta</i> | 58. | <i>konok</i> |
| 12. | <i>tainina, utitidzi</i> | 59. | <i>wengetene</i> |
| 13. | <i>tanina</i> | 60. | <i>konok</i> |
| 14. | <i>taitu</i> | 61. | <i>mogok</i> |
| 15. | <i>te</i> | 62. | <i>mohokung</i> |
| 16. | <i>eze</i> | 63. | <i>kobelak</i> |
| 17. | <i>es</i> | 64. | <i>kubogen</i> |
| 18. | <i>takanan</i> | 65. | <i>ningalac</i> |
| 19. | <i>takanangk</i> | 66. | <i>kubugang</i> |
| 20. | <i>bicits</i> | 67. | <i>fikanggang, kubugang</i> |
| 21. | <i>bisinta</i> | 68. | <i>nogan</i> |
| 22. | <i>bisinta</i> | 69. | <i>ningit</i> |
| 23. | <i>tangkua</i> | 70. | <i>ninggeni</i> |
| 24. | <i>bisan</i> | 71. | <i>kutnung, kubegang</i> |
| 25. | <i>bicits</i> | 72. | <i>ningit</i> |
| 26. | <i>oroz</i> | 73. | <i>kubini</i> |
| 27. | <i>bisangcwa</i> | 74. | <i>bat</i> |
| 28. | <i>taginei</i> | 75. | <i>kumbangan</i> |
| 29. | <i>munuts</i> | 76. | <i>tapatu</i> |
| 30. | <i>urus</i> | 77. | <i>kumbagan</i> |
| 31. | <i>uruts</i> | 78. | <i>kwana</i> |
| 32. | <i>ti, kiramong</i> | 79. | <i>isan</i> |
| 33. | <i>ti</i> | 80. | <i>esal</i> |
| 34. | <i>ti</i> | 80a | <i>duwit</i> |
| 35. | <i>ti</i> | 81. | <i>kamantewe</i> |
| 36. | <i>tika</i> | 82. | <i>kuwaran</i> |
| 37. | <i>timu</i> | 83. | <i>koweran</i> |
| 38. | <i>tom</i> | 84. | <i>kongotai</i> |
| 39. | <i>tom</i> | 85. | <i>ongkogon</i> |
| 40. | <i>tom</i> | 86. | <i>harawo</i> |
| 41. | <i>munugon</i> | 87. | <i>mmuaa-vai</i> |
| 42. | <i>macgu</i> | 88. | <i>nanso</i> |
| 43. | <i>moc</i> | 89. | <i>fati</i> |
| 44. | <i>motongo, wankembing</i> | 90. | <i>hunaninko</i> |
| 45. | <i>momagu</i> | 91. | <i>tona, uwa'na</i> |
| 46. | <i>moketong</i> | 92. | <i>hankwona</i> |
| 47. | <i>moniang</i> | 93. | <i>anga'no, ananoi, hekwe,
gonangi</i> |
| 48. | <i>mongkeangka</i> | 94. | <i>'kwənənoi</i> |
| 49. | <i>moko</i> | 94a | <i>pono</i> |
| 50. | <i>mohot</i> | 95. | <i>nak</i> |
| 51. | <i>kutam</i> | 96. | <i>nap</i> |
| 52. | <i>kanok</i> | 97. | <i>nent, nao</i> |
| 53. | <i>tauc</i> | 98. | <i>da</i> |
| 54. | <i>kweji</i> | 99. | <i>tena</i> |
| 55. | <i>kwep</i> | | |

100. *dekako*
101. *da*

102. *dembaka*
103. *dengkaka*

WORDS FOR 'TWO' IN MOROBE LANGUAGES

- | | |
|---------------------------------------|------------------------------------|
| 1. <i>lu, ulu</i> | 44. <i>woic, tukembing</i> |
| 2. <i>ailu</i> | 45. <i>erehec, uluhu</i> |
| 3. <i>lua</i> | 46. <i>yoyoka</i> |
| 4. <i>salu</i> | 47. <i>yaekang</i> |
| 5. (no data) | 48. <i>yaekang</i> |
| 6. <i>lua</i> | 49. <i>yakeko</i> |
| 7. <i>luagic</i> | 50. <i>yahat</i> |
| 8. <i>ru</i> | 51. <i>ikop</i> |
| 9. <i>ru</i> | 52. <i>zagat</i> |
| 10. <i>rua, dua</i> | 53. <i>kosop</i> |
| 11. <i>ru</i> | 54. <i>jeba</i> |
| 12. <i>lua</i> | 55. <i>zut</i> |
| 13. <i>lua</i> | 56. <i>okop</i> |
| 14. <i>rua</i> | 57. <i>etke</i> |
| 15. <i>lu</i> | 58. <i>yogop</i> |
| 16. <i>rua</i> | 59. <i>etka</i> |
| 17. <i>ru</i> | 60. <i>lauwo</i> |
| 18. <i>suruk</i> | 61. <i>reget</i> |
| 19. <i>serok</i> | 62. <i>weit</i> |
| 20. <i>siruc</i> | 63. <i>yalambok</i> |
| 21. <i>iruc, irurun, bisi da bisi</i> | 64. <i>yare</i> |
| 22. <i>iru</i> | 65. <i>yalambok</i> |
| 23. <i>iruk</i> | 66. <i>lifet</i> |
| 24. <i>leluk</i> | 67. <i>lupek, lifet</i> |
| 25. <i>siruc</i> | 68. <i>tipet</i> |
| 26. <i>serok</i> | 69. <i>yaru</i> |
| 27. <i>iriciru</i> | 70. <i>tupet</i> |
| 28. <i>seik</i> | 71. <i>lufom, lipet</i> |
| 29. <i>siluk</i> | 72. <i>yali</i> |
| 30. <i>siruk</i> | 73. <i>fama, famak, kubiniksak</i> |
| 31. <i>siruc</i> | 74. <i>yara</i> |
| 32. <i>yu</i> | 75. <i>yara</i> |
| 33. <i>yuuh</i> | 76. <i>tapaya</i> |
| 34. <i>lu</i> | 77. <i>yala</i> |
| 35. <i>yuu</i> | 78. <i>irisa</i> |
| 36. <i>lu</i> | 79. <i>bronge</i> |
| 37. <i>uy</i> | 80. <i>brong</i> |
| 38. <i>(lokuang) yu</i> | 80a <i>kumjat</i> |
| 39. <i>zu</i> | 81. <i>yara</i> |
| 40. <i>yi</i> | 82. <i>danggan</i> |
| 41. <i>lolon</i> | 83. <i>yara</i> |
| 42. <i>jahockang</i> | 84. <i>eleko</i> |
| 43. <i>yayahec</i> | 85. <i>yait</i> |

86.	<i>abugi</i>	95.	<i>nayau</i>
87.	<i>taara-vaitana</i>	96.	<i>houlounariv</i>
88.	<i>yakwu</i>	97.	<i>nentepar, naorar</i>
89.	<i>hivacu</i>	98.	<i>tote</i>
90.	<i>hukwego</i>	99.	<i>eseri</i>
91.	<i>tavau, huvaa'u</i>	100.	<i>eto</i>
92.	<i>hankwakwu</i>	101.	<i>eto</i>
93.	<i>hufa'u</i>	102.	<i>eto</i>
94.	<i>u'laako, huluwaku, hoku</i>	103.	<i>eta</i>
94a	<i>penkwai</i>		

WORDS FOR 'THREE' IN MOROBE LANGUAGES

1.	<i>to, tu, tur</i>	36.	<i>yan</i>
2.	<i>aitol</i>	37.	<i>yar</i>
3.	<i>tarawa</i>	38.	<i>(lokuang) lu</i>
4.	<i>sidi</i>	39.	<i>lu</i>
5.	(no data)	40.	<i>lu</i>
6.	<i>tori</i>	41.	<i>albon</i>
7.	<i>tiliac, treia</i>	42.	<i>harebec</i>
8.	<i>tol</i>	43.	2 + 1
9.	<i>tol</i>	44.	<i>karong, karowong, tirikeming</i>
10.	<i>tol, ton</i>	45.	<i>harewec</i>
11.	<i>tel</i>	46.	2 + 1
12.	<i>tua, 2 + 1</i>	47.	<i>habakang</i>
13.	2 + 1	48.	<i>araboa</i>
14.	<i>ngato</i>	49.	<i>korobo</i>
15.	<i>tol</i>	50.	<i>karambut</i>
16.	<i>tolu</i>	51.	2 + 1
17.	<i>tol</i>	52.	<i>karambut</i>
18.	2 + 1	53.	<i>karembot</i>
19.	2 + 1	54.	<i>tuba</i>
20.	2 + 1	55.	<i>tuk</i>
21.	2 + 1	56.	2 + 1, <i>karebot</i>
22.	2 + 1	57.	<i>karewe</i>
23.	2 + 1	58.	<i>maik, kalambu</i>
24.	2 + 1	59.	<i>karamba</i>
25.	2 + 1	60.	<i>olowu</i>
26.	2 + 1	61.	<i>karewet</i>
27.	2 + 1	62.	<i>karambut</i>
28.	2 + 1	63.	2 + 1
29.	2 + 1	64.	2 + 1
30.	2 + 1	65.	2 + 1
31.	2 + 1	66.	2 + 1
32.	<i>yal</i>	67.	<i>lufeten, difetening, 2 + 1?</i>
33.	<i>yaar</i>	68.	2 + 1
34.	<i>lal</i>	69.	2 + 1
35.	<i>yon</i>	70.	2 + 1

71.	2 + 1	88.	<i>mulumo</i>
72.	2 + 1	89.	2 + 1
73.	2 + 1, <i>fimeneng</i>	90.	2 + 1
74.	2 + 1	91.	2 + 1
75.	2 + 1	92.	2 + 1
76.	2 + 1	93.	2 + 1
77.	2 + 1	94.	2 + 1
78.	<i>kapusa</i>	94a.	2 + 1
79.	<i>kabe</i>	95.	2 + 1
80.	<i>kape</i>	96.	2 + 1
80a.	<i>kapu</i>	97.	2 + 1
81.	<i>kalahu</i>	98.	<i>tamode</i>
82.	<i>kailpu</i>	99.	<i>tapari</i>
83.	<i>kabma</i>	100.	<i>etama</i> (2 + 1?)
84.	<i>olowu</i>	101.	2 + 1?
85.	<i>atvi</i>	102.	2 + 1?
86.	<i>abono</i>	103.	2 + 1?
87.	2 + 1		

WORDS FOR 'FOUR' IN MOROBE LANGUAGES

1.	<i>hale</i>	28.	2 + 2
2.	<i>aivat</i>	29.	2 + 2
3.	<i>nga</i>	30.	2 + 2
4.	<i>suha</i>	31.	2 + 2
5.	(no data)	32.	<i>vei, ba lu</i>
6.	<i>wata</i>	33.	2 + 2
7.	<i>acle</i>	34.	2 + 2
8.	<i>pang</i>	35.	2 + 2
9.	<i>pai</i>	36.	2 + 2?
10.	<i>pange, tantan</i>	37.	<i>nyekuy</i>
11.	<i>pang</i>	38.	<i>(lokuang) va</i>
12.	2 + 2	39.	<i>va</i>
13.	2 + 2	40.	<i>va</i>
14.	<i>ngapa</i>	41.	<i>ilon</i>
15.	<i>pat</i>	42.	<i>neaqac</i>
16.	<i>pange</i>	43.	2 + 2
17.	<i>pang</i>	44.	<i>nemungac, fololo</i>
18.	2 + 2	45.	<i>kembong pa</i>
19.	2 + 2	46.	2 + 2
20.	2 + 2	47.	2 + 2
21.	2 + 2	48.	<i>iforec</i>
22.	2 + 2	49.	<i>kiwele</i>
23.	2 + 2	50.	<i>kihiwet</i>
24.	2 + 2	51.	2 + 2
25.	2 + 2	52.	<i>kimembut</i>
26.	2 + 2	53.	2 + 2
27.	2 + 2	54.	<i>babumba</i>

55.	2 + 2	80a.	2 + 2
56.	2 + 2	81.	2 + 2
57.	2 + 2	82.	2 + 2
58.	<i>imbot</i>	83.	2 + 2
59.	2 + 2	84.	2 + 2
60.	<i>imbot</i>	85.	<i>anumuno</i>
61.	<i>kembem kpagap</i>	86.	2 + 2
62.	<i>kimbam parup</i>	87.	2 + 2
63.	2 + 2	88.	<i>mulamula</i>
64.	2 + 2, <i>imaninamo</i>	89.	2 + 2
65.	2 + 2	90.	2 + 2
66.	2 + 2	91.	2 + 2
67.	2 + 2, <i>didim, diding</i>	92.	2 + 2
68.	2 + 2	93.	<i>osofo fo fa'u'no</i>
69.	2 + 2	94.	2 + 2
70.	2 + 2	94a.	2 + 2
71.	2 + 2	95.	<i>mango bek tau ono</i>
72.	2 + 2	96.	2 + 2
73.	2 + 2, <i>fimenengging</i>	97.	<i>kong nent, 2 + 2</i>
74.	2 + 2	98.	<i>tamode da gagani (3 + 1?)</i>
75.	2 + 2	99.	2 + 2
76.	2 + 2	100.	3 + 1
77.	2 + 1 + 1	101.	2 + 2, <i>wana awa patitiro</i>
78.	<i>niming kining</i>	102.	<i>ikapatige</i>
79.	2 + 2	103.	<i>singwopatige</i>
80.	2 + 2		

WORDS FOR 'FIVE' AND 'HAND' IN MOROBE LANGUAGES

	FIVE	HAND			
			16.	(hand)	<i>nimanda</i>
1.	<i>lim (dang)</i>	<i>amang</i>		<i>lima</i>	
2.	(= hand)	<i>bage</i>	17.	<i>lim</i>	<i>ima</i>
3.	<i>lita</i>	<i>mange</i>			<i>niman</i>
4.	<i>maipi</i>	<i>nama</i>	18.	(= hand)	<i>bangi</i>
5.	(no data)	(no data)	19.	(= hand)	<i>bangge</i>
6.	(= hand)	<i>nima</i>	20.	(= hand)	<i>biangke</i>
7.	(= hand)	<i>lemeng</i>	21.	2 + 2 + 1	<i>bangi</i>
8.	<i>lim</i>	<i>bagek</i>	22.	2 + 1 + 2	?
9.	<i>lim</i>	<i>baene</i>	23.	2 + 2 + 1	?
10.	(= hand)	<i>bayer</i>	24.	2 + 2 + 1	?
	(= hand)	<i>bager</i>	25.	(= hand)	<i>bangke</i>
11.	<i>lama(ta)</i>	<i>nomong</i>	26.	(= hand)	<i>bangid</i>
12.	2 + 2 + 1	<i>rimana</i>	27.	(= hand)	<i>bacin</i>
13.	2 + 2 + 1	<i>dimara</i>	28.	(= hand)	<i>limangga</i>
14.	<i>lima</i>	<i>mbao</i>	29.	(= hand)	<i>baing</i>
15.	<i>lim</i>	<i>lima</i>	30.	(= hand)	<i>baing</i>
		<i>lemang</i>	31.	(= hand)	<i>pangging</i>

32.	<i>lim</i>	<i>memang</i>	69.	(= hand)	<i>kit</i>
33.	(= hand)	<i>nama</i>	70.	2 + 2 + 1	<i>kudne</i>
34.	(= hand)	<i>orund</i>	71.	(= hand)	<i>kafong</i>
35.	(= hand)	<i>vige</i>			<i>kohong</i>
		<i>nema</i>	72.	<i>niya</i>	<i>keli</i>
36.	(= hand)	<i>banggi</i>	73.	2 + 2 + 1	<i>kafini</i>
		<i>vanggi</i>		<i>fimenengsinik</i>	
37.	(= hand)	<i>nəma</i>	74.	2 + 2 + 1	<i>kesit</i>
38.	(= hand)	<i>baheng</i>	75.	<i>iman</i>	<i>ket</i>
39.	(= hand)	<i>bahem</i>	76.	2 + 2 + 1	<i>kata</i>
40.	(= hand)	<i>vagem</i>	77.	2 + 1 + 2	<i>ket</i>
41.	(= hand)	<i>mili</i>	78.	(= hand)	<i>kande</i>
42.	(= hand)	<i>mara</i>	79.	2 + 2 + 1	<i>kolom</i>
43.	(= hand)	<i>memoc</i>	80.	(= hand)	<i>kodom</i>
44.	(hand)	<i>boro</i>	80a.	(= hand)	<i>korun</i>
	<i>faingambe</i>		81.	(= hand)	<i>get</i>
45.	(= hand)	<i>mera</i>	82.	(= hand)	<i>kaibue</i>
46.	(= hand)	<i>mə</i>	83.	2 + 2 + 1	?
47.	(= hand)	<i>mole</i>	84.	(= hand)	<i>meme</i>
48.	(= hand)	<i>mə</i>	85.	(= hand)	<i>obu</i>
49.	(= hand)	<i>mə</i>	86.	3 + 2	<i>omaido</i>
50.	(= hand)	<i>boro</i>	87.	(= hand)	<i>yaaku</i>
51.	(= hand)	<i>holi</i>	88.	(= hand)	<i>ikwi</i>
52.	(= hand)	<i>bet</i>	89.	2 + 2 + 1	<i>feca</i>
53.	(= hand)	<i>suli</i>		(= hand)	
54.	(= hand)	<i>bainim</i>	90.	(= hand)	?
55.	(= hand)	<i>bet</i>	91.	2 + 2 + 1	<i>vaeya</i>
56.	(= hand)	<i>mete</i>	92.	(= hand)	<i>hipa</i>
57.	(= hand)	<i>mete</i>		2 + 2 + 1	
58.	(= hand)	<i>bot</i>	93.	(= hand)	<i>aho</i>
59.	(= hand)	<i>meta</i>	94.	(= hand)	<i>wəlyəmpu</i>
60.	<i>momerok</i>	<i>bot</i>	94a.	(= hand)	<i>ha</i>
61.	(= hand)	<i>mara</i>	95.	(= hand)	<i>mere</i>
62.	(hand)	<i>biri</i>	96.	(= hand)	<i>mar</i>
	<i>naman</i>		97.	(= hand)	<i>mor</i>
63.	2 + 2 + 1	<i>mem</i>	98.	(= hand)	<i>ingo</i>
64.	<i>iman</i>	<i>kairi</i>	99.	(= hand)	<i>boto</i>
65.	2 + 2 + 1	?	100.	(= hand)	<i>nago</i>
66.	2 + 2 + 1	<i>kafong</i>	101.	(= hand)	<i>wana</i>
67.	(= hand)	<i>ko</i>	102.	(= hand)	<i>uma</i>
		<i>kafo</i>	103.	(= hand)	<i>wangwo</i>
68.	(= hand)	<i>kit</i>			

WORDS FOR 'TEN' IN MOROBE LANGUAGES

- | | | | |
|----|---------------|----|---------------|
| 1. | <i>sahuc</i> | 2. | (tally total) |
| | (tally total) | 3. | <i>taomo</i> |

- | | | | |
|-----|-----------------|------|-----------------------|
| 4. | <i>numusu</i> | 48. | (tally total) |
| 5. | (no data) | 49. | (tally total) |
| 6. | (tally total) | 50. | (tally total) |
| 7. | (tally total) | 51. | (tally total) |
| 8. | <i>sangul</i> | 52. | (tally total) |
| 9. | <i>sangaul</i> | 53. | (tally total) |
| 10. | (tally total) | 54. | (tally total) |
| 11. | 5 x 2 | 55. | (tally total) |
| 12. | (tally total) | 56. | (tally total) |
| 13. | (tally total) | 57. | (tally total) |
| 14. | <i>sangao</i> | 58. | (tally total) |
| 15. | 5 x 2 | 59. | (tally total) |
| 16. | (tally total) | 60. | (tally total) |
| 17. | <i>sangul</i> | 61. | (tally total) |
| 18. | (tally total) | 62. | (tally total) |
| 19. | (tally total) | 63. | (tally total) |
| 20. | (tally total) | 64. | (tally total) |
| 21. | (tally total) | 65. | (tally total) |
| 22. | (tally total) | 66. | (tally total) |
| 23. | (tally total) | 67. | (tally total) |
| 24. | (tally total) | 68. | (tally total) |
| 25. | (tally total) | 69. | (tally total) |
| 26. | (tally total) | 70. | (tally total) |
| 27. | (tally total) | | <i>singen?</i> |
| 28. | (tally total) | 71. | (tally total) |
| 29. | (tally total) | 72. | (tally total) |
| 30. | (tally total) | 73. | (tally total) |
| 31. | (tally total) | | <i>memenggingsini</i> |
| 32. | <i>omin</i> | 74. | (tally total) |
| | (tally total)? | 75. | (tally total) |
| 33. | (tally total) | 76. | (tally total) |
| 34. | (tally total) | 77. | (tally total) |
| 35. | (tally total) | 78. | (tally total) |
| 36. | (tally total) | 79. | (tally total) |
| 37. | (tally total) | 80. | (tally total) |
| 38. | <i>lauming</i> | 80a. | (tally total) |
| 39. | <i>laumin</i> | 81. | (tally total) |
| 40. | <i>lauming</i> | 82. | (tally total) |
| 41. | <i>melalin</i> | 83. | 3 + 3 + 3 + 1 |
| 42. | (tally total) | 84. | (tally total) |
| 43. | (tally total) | 85. | (tally total) |
| 44. | (tally total) | 86. | 3 + 3 + 3 + 1 |
| | <i>hetening</i> | 87. | (tally total) |
| 45. | (tally total) | 88. | (tally total) |
| 46. | (tally total) | 89. | (tally total) |
| 47. | (tally total) | 90. | (tally total) |

91.	(tally total)	98.	(tally total)
92.	(tally total)		<i>aobe ao?</i>
93.	(tally total)	99.	(tally total)
94.	(tally total)	100.	(tally total)
94a.	(tally total)	101.	(tally total)
95.	(tally total)	102.	(tally total)
96.	(tally total)	103.	(tally total)
97.	(tally total)		

APPENDIX C

ALPHABETICAL LIST OF MOROBE LANGUAGES

Each Morobe language is given a number according to the classification adopted in section 2.2.2. These numbers are used for ordering the languages when presenting data in Appendices A and B. The following alphabetical listing is to facilitate location of a particular language.

LANGUAGE NAME	LANGUAGE NUMBER	Jabim	see Yabim
Adzera	21	Kaiwa	2
Agaataha	88	Kamasa	90
Ampeeli	see Safeyoka	Kapau	see Hamtai
Bam	74	Kapin	32
Barim	8	Kâte	43
Biangai	95	Kawatsa	91
Binandere	98	Kela	3
Bonkiman	79	Kinalakna	51
Bukauac	1	Komba	52
Bukawa	see Bukauac	Komutu	81
Burum	50	Koripon	80a
Dangal	18	Kosorong	44
Dedua	42	Kotte	see Kâte
Duwet	28	Kovai	41
Finungwa	63	Kube	45
Gitua	16	Kumukio	53
Guhu-Samane	99	Kunimaipa	96
Gusan	64	Labu	4
Guwot	see Duwet	Lae	5
Hamtai	89	Langimar	see Agaataha
Hote	38	Lokep	9
Hube	see Kube	Lukep	see Lokep
Irumu	75	Malasanga	10
Isan	80	Mamaa	65
Iwal	see Kaiwa	Manga	33
Jabem	see Yabim	Mangap	11
		Mape	46
		Mapos	34

Maralango	19	Siboma	see Numbami
Mawae	100	Silisili	20
Menya	92	Sio	14
Mesem	54	Sipoma	see Numbami
Migabac	47	Sirak	30
Misim	39	Sirasira	23
Momolili	see Mesem	Som	83
Munkip	66	Suena	101
Musom	29	Sukurum	24
Mutu	17	Susuami	94a
Nabak	55	Tami	15
Nafi	see Sirak	Unank	25
Nakama	67	Urii	73
Nambom	see Sirak	Vehes	37
Nek	68	Waffa	87
Nenaya	12	Wampar	26
Nengaya	see Nenaya	Wampur	27
Ngariawan	22	Wantoat	76
Nimi	69	Wasembo	86
Nomu	56	Weri	97
Nuk	70	Wojokeso	see Safeyoka
Numanggang	71	Yabim	7
Numbami	6	Yabem	see Yabim
Onank	see Unank	Yagawak	77
Ono	57	Yagwoia	94
Piu	36	Yaknge	62
Roinji	13	Yalu	31
Safeyoka	93	Yamap	40
Sakam	82	Yau	85
Sauk	72	Yekora	102
Selepet	58	Yupna	see Isan
Sene	49	Zia	103
Sialum	59		

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POLICE MOTU OF THE SECOND WORLD WAR: A RECORD OF INTERVIEW WITH NANAI GIGOVI, 1942

TOM DUTTON

INTRODUCTION

In a previous publication (Dutton 1986) I referred to sound recordings of Police (now Hiri) Motu that were made in Australia during World War II.¹ These recordings were made by Nanai Gigovi of Babaguna village in the Gulf of Papua during a visit to Australia in 1942 as part of a propaganda exercise by Allied Forces in their fight against Japanese Forces in Papua New Guinea at the time. As such they represent the earliest known surviving oral recordings of the language and therefore most valuable historical documents. In the publication referred to above I described and discussed the linguistic features of Nanai's speech together with those of available written materials and used them to draw certain conclusions about the nature of Police Motu at that time and of its history. This description and discussion were based on a preliminary transcript of Nanai's texts which at that time only existed in manuscript form except for a small illustrative excerpt which was published as Appendix 4 in that paper. It is the purpose of this paper to now make the full texts, together with free translations of them, more widely available.

THE TEXTS

There are two texts. These correspond to phonograph recordings 36 and 79 held at the Australian War Memorial.

The transcription and translation of these texts were made by me as part of my investigation into the history of Police Motu (Dutton 1985). They are revised versions of an earlier tentative version made after consulting Nanai and his relatives in Babaguna in 1984. Even so there are still one or two places in the text where what is being said is uncertain and where the order of events being talked about is unclear either because Nanai was unfamiliar with the geography of Australia or because those making up the final recordings have arranged the excerpts to suit their own purposes.²

The texts are presented in three lines. The first is a broad transcription of Nanai's, and for consistency's sake, the interviewer's speech. The second, the equivalent of the first in normal Police (now Hiri) Motu spelling, except for words not in use today, or not in relevant dictionaries, when they are spelled as I think they would generally be pronounced by Police (now Hiri) Motu speakers

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(e.g. towns in Australia, war equipment). This double representation is designed to show up idiosyncratic aspects of Nanai's and the interviewer's speech. The third line gives English glosses for the Police Motu words in the other lines. Otherwise the following conventions are used:

- ... speech continues but is interrupted by another speaker
- false start, change of mind, faltering
- (?) the preceding word or words is thought to be as indicated but cannot be vouched for; uncertain
- ,
- .
- :(:): lengthening for emphasis or to indicate extent or continuity
- I person interviewing Nanai (apparently a native speaker of English)
- N Nanai Gigovi

Finally it is to be noted that part of the material that occurs on recording 36 is repeated on recording 79.

TEXT NO.1 - RECORDING 36

- I: *Omui lao negana da:ka omi itaia, tau kurokuro hanua dekena?*
Umui lao negana dahaka umui itaia, tau kurokuro hanau dekena?
 You (pl) go time what you (pl) see man white village at
 'When you (pl) went [to Australia] what did you see in the Europeans' towns [lit. villages]?'
 N: *O, gau momo idia karaia. Tau kurokuro guna idia heleva,*
O, gau momo idia karaia. Tau kurokuro guna idia hereva,
 oh thing many they make man white before they say
momo, diba las taudia, idia kwo inei aniani gaudia bouna,
momo, diba lasi taudia, idia gwau inai aniani gaudia ibounai,
 many know not persons they say this food things all
ipidi bouna, wosipi ibouna, stima ibounai, tau kurokuro
ipidi ibounai, wosipi ibounai, stima ibounai, tau kurokuro
 gun all warship all boat all man white
ia kalaia las, hari be mas taudia idia karaia.
ia karaia lasi, hari be mase taudia idia karaia.
 he make not now FOCUS dead people they make
Las, mas taudia idia karaia las. Lau Nanai lau ula heleva,
Lasi, mase taudia idia karaia lasi. Lau Nanai lau ura hereva,
 no dead people they make not I Nanai I want say

lau Nanai Gigove, lau idiena hanua ibounai lau loaloo,
lau Nanai Gigovi, lau idia-ena hanua ibounai lau loaloo,
 I Nanai Gigovi I their village all I walk.around

lau itaia, gau ibounai idia karaia. Misingan idia karaia.
lau itaia, gau ibounai idia karaia. Misinigani idia karaia.
 I see thing all they make machine-gun they make

Wosipi badadia idia karaia. Plaimasisi ibounai idia kalaia.
Wosipi badadia idia karaia. Plaimasini ibounai idia karaia.
 warship big.ones they make aeroplane all they make

Auri idia karaia. Tanu bona auri idia nadua idia mistim.
Auti idia karaia. Tano bona auri idia nadua idia mistim.
 iron they make soil and iron they cook.up they mix

La daikau inei laidi bamona. Wadan idia bubua tanika dekena.
La daekau inai laidi bamona. Vadaeni idia bubua tanika dekena.
 it goes.up this light like okay they tip tank into

Idia abia lau, misin dekena idia bubua maraki maraki.
Idia abia lao, misini dekena idia bubua maraki maraki.
 they get go machine into they tip little little

Wadaini misin ia halataia ia lau ia bada herea.
Vadaeni misini ia halataia ia lao ia bada herea.
 okay machine it makes.longer it go it big very

La gau latalata. Wadaini idia kwotua.
La gau latalata. Vadaeni idia kwotua.
 it thing longish okay they fasten.

'Oh, they make lots of things. The Europeans say that before there used to be a lot of people who did not know what they were talking about who used to say that all this food and all these guns and warships and boats were not made by Europeans but were being made by [our] ancestors [lit. dead people]. No, [our] ancestors do not make them. I, Nanai, want to say that I, Nanai Gigovi, visited all their towns and saw all the things they make. They make machine-guns, big warships, all the planes, iron. They cook up soil and iron and mix it up. This flares up like a light. Then they tip it into a tank. They take it and pour it into a machine a little bit at a time. Then the machine extrudes it and it comes out much longer. Then they fasten it.'

I: *Da:ka oi itaia tau kurokuro hanua dekena?*
Dahaka oi itaia tau kurokuro hanua dekena?
 what you see man white village at

'What did you see in the Europeans' towns?'

N: *Badina lau mai be Gaman ia bogahisi maraki lasi bona*
Badina lau mai be Gavamani ia bogahisi maraki lasi bona
 reason I come FOCUS government it sad little not and

<i>Ostrelya</i>	<i>taudia</i>	<i>idia</i>	<i>bogahisi</i>	<i>maraki</i>	<i>las</i>	<i>lau</i>	<i>dekena.</i>	
<i>Ostrelya</i>	<i>taudia</i>	<i>idia</i>	<i>bogahisi</i>	<i>maraki</i>	<i>lasi</i>	<i>lau</i>	<i>dekena.</i>	
Australia	people	they	sad	little	not	me	to	
<i>Inei</i>	<i>dekenai</i>	<i>lau mai,</i>	<i>idiediaena</i>	<i>hanua</i>	<i>dekenai.</i>	<i>Wadaini</i>		
<i>Inai</i>	<i>dekenai</i>	<i>lau mai,</i>	<i>idia-edia</i>	<i>hanua</i>	<i>dekenai.</i>	<i>Vadaeni</i>		
this	for	I	come	their	village	to	all.right	
<i>idiedia</i>	<i>gaukwreia</i> ³	<i>gau</i>	<i>ibounai</i>	<i>lau itaia.</i>	<i>Wada</i>	<i>idia</i>		
<i>idia-edia</i>	<i>gaukaraia</i>	<i>gau</i>	<i>ibounai</i>	<i>lau itaia.</i>	<i>Vadaeni</i>	<i>idia</i>		
their	manufacture.it	thing	all	I see.it	okay	they		
<i>karaia</i>	<i>be</i>	<i>idia</i>	<i>diba</i>	<i>momo.</i>	<i>Hahine</i>	<i>taudia</i>	<i>danu</i>	<i>bona</i>
<i>karaia</i>	<i>be</i>	<i>idia</i>	<i>diba</i>	<i>momo.</i>	<i>Hahine</i>	<i>taudia</i>	<i>danu</i>	<i>bona</i>
make	FOCUS	they	know	much	woman	persons	also	and
<i>kekeni</i>	<i>taudia</i>	<i>danu</i>	<i>ibounai</i>	<i>idia</i>	<i>gaukreia.</i>	<i>Tau</i>	<i>idia</i>	<i>dulua</i>
<i>kekeni</i>	<i>taudia</i>	<i>danu</i>	<i>ibounai</i>	<i>idia</i>	<i>gaukaraia.</i>	<i>Tau</i>	<i>idia</i>	<i>durua</i>
girl	persons	also	all	they	manufacture	man	they	help
<i>edi--</i>	<i>mahuta</i>	<i>lasi</i>	<i>hanuaboi</i>	<i>ibounai</i>	<i>bona</i>	<i>dina</i>	<i>ibounai</i>	<i>idia</i>
<i>edi--</i>	<i>mahuta</i>	<i>lasi</i>	<i>hanuaboi</i>	<i>ibounai</i>	<i>bona</i>	<i>dina</i>	<i>ibounai</i>	<i>idia</i>
	sleep	not	at.night	all	and	day	all	they
<i>gaukreia</i>	<i>hanahana,</i>	<i>bona</i>	<i>badina</i>	<i>idia</i>	<i>laloa</i>	<i>Papuom</i>	<i>be</i>	
<i>gaukaraia</i>	<i>hanaihanai</i>	<i>bona</i>	<i>badina</i>	<i>idia</i>	<i>laloa</i>	<i>Papuom</i>	<i>be</i>	
produce	always	and	because	they	think	Papuan	FOCUS	
<i>idia</i>	<i>be</i>	<i>gwada</i>	<i>lasi.</i>	<i>Idia</i>	<i>gau</i>	<i>ibounai</i>	<i>karaia</i>	<i>diba</i>
<i>idia</i>	<i>be</i>	<i>goada</i>	<i>lasi.</i>	<i>Idia</i>	<i>gau</i>	<i>ibounai</i>	<i>karaia</i>	<i>diba</i>
they	FOCUS	strong	not	they	thing	all	make	know
								not
<i>taudia,</i>	<i>wadain</i>	<i>Gavana</i>	<i>ia</i>	<i>bogasis,</i>	<i>Ostrelya</i>	<i>Gavana</i>	<i>ia</i>	
<i>taudia,</i>	<i>vadaeni</i>	<i>Gavana</i>	<i>ia</i>	<i>bogahisi</i>	<i>Ostrelya</i>	<i>Gavana</i>	<i>ia</i>	
persons	okay	governor	he	sad	Australia	governor	he	
<i>bogasisi</i>	<i>wadain,</i>	<i>lau</i>	<i>mai</i>	<i>idiediaena</i>	<i>gaukwreia</i>	<i>gau</i>		
<i>bogahisi</i>	<i>vadaeni,</i>	<i>lau</i>	<i>mai</i>	<i>idia-edia</i>	<i>gaukaraia</i>	<i>gau</i>		
sad	all.right	I	come	their	manufacture	thing		
<i>ibounai</i>	<i>lau</i>	<i>itaia.</i>						
<i>ibounai</i>	<i>lau</i>	<i>itaia.</i>						
all	I	see.						

'The reason I went [lit. came] was because the Government and Australians were quite sorry for me. Consequently I went to see their towns. I saw all the things they produce. They know a lot. Women and girls as well, they all produce goods. The men help them. They don't sleep the whole night and day away; they work continuously and because [of that] they think Papuans are not strong; they do not know how to make everything. So the Governor, the Australian Governor, was sad and I went and saw all the things they produce.'

I: *Momokan?*
Momokani?
 true

'Is that true?'

N: *Io, momokan. Koikoi las. Lau heleva be momokan lau heleva.*
Io, momokani. Koikoi lasi. Lau hereva be momokani lau hereva.
 yes true false not I speak FOCUS true I speak

'Yes, that's true. It's not a lie. What I am saying is true.'

I: *Guna tau kurokuro ia tuari ura las. Ia omui sibona*
Guna tau kurokuro ia tuari ura lasi. Ia umui sibona
 before man white he fight want not he you (pl) only

ia naria, momokan o las?

ia naria, momokani o lasi?

he look.after true or not

'Europeans did not want to fight at first/before. They only wanted to look after you [Papuaans] didn't they?'

N: *Io, momokan. Idia be idia ura las tuari.*
Io, momokani. Idia be idia ura lasi tuari.
 yes true they FOCUS they want not fight

'Yes, that's true. They did not want to fight.'

I: *Oi itaia uma gabuna?*
Oi itaia uma gabuna?
 you see garden place

'Did you see agricultural areas [lit. gardens]?'

N: *Io, uma gabuna lau itaia. Idia karaia plaua be idia karaia,*
Io, uma gabuna lau itaia. Idia karaia plaua be idia karaia,
 yes garden place I see they make bread FOCUS they make

raisi idia karaia, guna idia gaukwrei.

raisi idia karaia, guna idia gaukaraia.

rice they make before they manufacture

'Yes, I saw the agricultural areas. They make bread and rice. They produced it before.'

I: *Mamoi momo?*
Mamoi momo?
 sheep many

'Were there many sheep?'

N: *Io, mamoi momo, bolomakau momo, sipi momo.*
Io, mamoi momo, boromakau momo, sipi momo.
 yes sheep many cattle many sheep many

'Yes, there were lots of sheep and cattle.'

I: *la tuari taudia las?*
la tuari taudia lasi?
 they war people not

'They're not warmongers, are they?'

N: *Las, ia ura las tuari. Badina ia be taunimanim*
Lasi, ia ura lasi tuari. Badina ia be taunimanim
 no they want not fight reason they FOCUS people

momo las. Wadaini hanua be toi bamona. Namba wan
momo lasi. Vadaeni hanua be toi bamona. Namba wan
 many not all.right village FOCUS three like number one

be Taunsvolo. Wadain seken, be Bulispen. Wadain
be Taunsvolo. Vadaeni seken, be Burisbeni. Vadaeni
 FOCUS Townsville okay second FOCUS Brisbane okay

ia mai Sidin. Wadain ia mai insini be Ostrelya.
ia mai Sidini. Vadaeni ia mai inisini be Ostrelya.
 it come Sydney okay it come here FOCUS Australia

'No, they did not want to fight because there are not many of them. There are only about three [main] towns. The first one is Townsville, the second Brisbane and the other one Sydney. And that's Australia.'

I: *Kone dekena sibona hanua ia no:?*
Kone dekena sibona hanua ia noho?
 beach on only village they stay

'The towns are only situated on the coast are they?'

N: *Kone dekenai hanua ia no: bona inei uda ibounai*
Kone dekenai hanua ia noho bona inai uda ibounai
 beach on village they stay and this bush all

lau mai itaia be o::, inei hanua bada herea inei uda
lau mai itaia be o::, inai hanua bada herea inai uda
 I come see FOCUS oh, this village big very this bush

ibounai hanua kavakava. Tauni kavakava. Tauni be maraki
ibounai hanua kavakava. Tauni kavakava. Tauni be maraki
 all village all.over town all.over town FOCUS small

las. Inei ladana ia bada be hanua toi dekena a--
lasi. Inai ladana ia bada be hanua toi dekena a--
 not. This name they big FOCUS village three at ah--

hanua ibounai be lau itaia be momo helea
hanua ibounai be lau itaia be momo herea
 village all FOCUS I see FOCUS many very

taunimanim momo helea. Tau momo, kekeni momo, hahine
taunimanim momo herea. Tau momo, kekeni momo, hahine
 people many very man many girl many woman

momo, taunimanima momo helea, helevana karaia las.
momo, taunimanima momo herea, herevana karaia lasi.
 many people many very talk make not

'[Yes] the towns are on the coast but [lit. and] oh, there are lots of them in the bush that I saw. Towns all over the place, and not small ones either. The best known ones are the three ah--, there are lots and lots of towns and people that I saw. Lots of men, girls, and women. Lots of people. There's no doubt about it.'

I: *Oi itaia wadain?*
Oi itaia vadaeni?
 you see completed

'You saw them did you?'

N: *Lau itaia wadaini, lauegu matana dekena. Lau diba ibounai.*
Lau itaia vadaeni, lauegu matana dekena. Lau diba ibounai.
 I see completed my eye with I know all

'I saw them with my own eyes. I know them all.'

I: *Oi daika?*
Oi daika?
 You who

'Who are you?'

N: *Lau Nanai. Lau Nanai Gigove, lau diba ibounai.*
Lau Nanai. Lau Nanai Gigovi, lau diba ibounai.
 I Nanai I Nanai Gigovi I know all

'I am Nanai, Nanai Gigovi. I know everything.'

I: *Faktri danu?*
Faketeri danu?
 factory also

'Factories too?'

N: *Faketeli momo. Idia karaia badadia.*
Faketeri momo. Idia karaia badadia.
 factory plenty they make big ones

'[Yes] many factories. They make big ones.'

I: *Hadibaia gauna?*
Hadibaia gauna?
 teach thing

'[and] educational things?'

N: *Yes, gau ibounai. Momo herea.*
Io, gau ibounai. Momo herea.
 Yes, thing all plenty very

'Yes, everything. Lots and lots.'

- I: *Inei ruma-- hadibaia ruma-- skol...*
Inai ruma-- hadibaia ruma-- skol...
 this house teach house school

'This house-- school house-- school...'

- N: *Hadibaia luma, wailisi dekena idia sikulu luma badadia*
Hadibaia ruma, wailisi dekena idia sikulu ruma badadia
 teach house wireless about they school house big.ones
- bona plaimisi dekenai sikulu luma badadia nao*
bona plaimisini dekenai sikulu ruma badadia nao
 and aeroplane about school house big.ones European
- fakteli badadia idia kalaia. Plaimasi idia abia lau*
faketeri badadia idia karaia. Plaimasini idia abia lao
 factory big.ones they make aeroplane they get go
- luma lalonai dekena idia karaia inisini idia sikul.*
ruma lalonai dekena idia karaia iniseni idia sikulu.
 house inside at they make here they school

'[Yes] they've built big schools to teach about wirelesses/radios in and about planes and big European factories. They have schools in hangars where they house and make planes.'

- I: *Japan taudia ia stat. Tau kurokuro ia ura las*
Diapani taudia idia stat. Tau kurokuro idia ura lasi
 Japan persons they start man white they want not
- tuari, ia diba las. Ia sikul wadain?*
tuari, idia diba lasi. Idia sikulu vadaeni?
 fight they know not they school completed

'The Japanese started it [the war]. The Europeans didn't want to fight. They weren't prepared [lit. didn't know]. They've now been brought up to scratch [lit. educated] have they?'

- N: *[In]ei Diapani be ia sikulu guna. Inei tau kurokuro be*
[In]ai Diapani be idia sikulu guna. Inai tau kurokuro be
 this Japan FOCUS they school first this man white FOCUS
- ia sikulu las. Ia hari be ia hekula.*
idia sikulu lasi. Idia hari be idia hekure.
 they school not they now FOCUS they lie.down

'The Japanese were prepared first [lit. went to school first]. The Europeans weren't prepared. They're still at a disadvantage [lit. lying down].'

- I: *Hari ia skol?*
Hari idia skol?
 Now they school

'They're training now are they?'

- N: *Hari ia sikulu, ia tuari gaukwreia be kahana ia*
Hari idia sikulu, idia tuari gaukaraia be kahana idia
 now they school they fight produce FOCUS side they
- karaia hari ia sikulu haida be matamata, ia diba las.*
karaia hari idia sikulu haida be matamata, idia diba lasi.
 make now they school some FOCUS new they know not
- Diba taudia wadain idia lau wadain tuari gabuna. Inei*
Diba taudia vadaeni idia lao vadaeni tuari gabuna. Inai
 know persons okay they go completed fight place this
- bamona ia karaia tau kurokuro be. Diba taudia idia lau*
bamona idia karaia tau kurokuro be. Diba taudia idia lao
 like they make man white FOCUS know persons they go
- ipidi badadia dekenai idiediena gabu(?).*
ipidi badadia dekenai idia-edia gabu(?).
 gun big.ones with their place(?).

'Now they're getting prepared. Part of the preparations for war are: those who have been trained [lit. know] have gone to the war. They have gone with their big weapons. Some of those still being trained are new [recruits] and don't know anything.'

- I: *Diba taudia ia hadibaia ia instrakta bamona ia skul?*
Diba taudia idia hadibaia idia instrakta bamona idia sikulu?
 Know persons they teach they instructor like they school

'Those who know [about war] act as instructors do they?'

- N: *Io, inei bamona idia sieia. Diba taudia be ia sieia.*
Ia, inai bamona idia siaia. Diba taudia be idia siaia.
 yes this like they send know persons FOCUS they send
- Diba las taudia ia lau emu gabu ia abia inei bamona.*
Diba lasi taudia idia lao idia-edia gabu idia abia inai bamona.
 know not persons they go their place they take this like
- Diba taudia idia lau gaukara. Diba las taudia idia lau sikulu.*
Diba taudia idia lao gaukara. Diba lasi taudia idia lao sikulu.
 know persons they go work know not persons they go school

'Yes, they send them like this. Those who are trained are sent off and those who aren't trained take their places. Those who are trained go and work, those who are not go to schools.'

- I: *Oi helai tren dekena? Oi lau lau::: uta dekena oi davaria?*
Oi helai tereni dekena? Oi lao lao::: uda dekena oi davaria?
 you sit train in you go go::: bush in you find

'You went by train didn't you? You went a long way into the bush and found them [camps] did you?'

- N: *O tlen dekenai lau lau::: uda dekenai inei kempa ibounai*
O treni dekenai lau lao::: uda dekenai inai kempa ibounai
 oh train in I go::: bush in this camp all

inei tau kurokuro kavakava, ami solodia. Solodia momo herea.
inaí tau kurokuro kavakava, ami solodia. Solodia momo herea.
 this man white crazy army soldier soldier many very

'Oh yes, I went a very long way into the bush to these camps where there were Europeans all over the place, army soldiers. There were lots and lots of soldiers.'

I: *Uma gabuna daika ia naria?*
Uma gabuna daika ia naria?
 Garden place who he look.after

'Who was looking after the farms?'

N: *O uma gabuna be taunimanim haida idia gaukwreia haida*
O uma gabuna be taunimanim haida idia gaukaraia haida
 oh garden place FOCUS people some they work some
be idia lau tuari dekenai.
be idia lao tuari dekenai.
 FOCUS they go fight to

'Oh, there were some people working on the farms. Others went off to the war.'

TEXT NO.2 - RECORDING 79 (EIGHT TRACKS)

TRACK NO.1

I: *Omui lao negana da:ka omi itaia, tau kurokuro hanua dekena?*
Umui lao negana dahaka umui itaia, tau kurokuro hanua dekena?
 you (pl) go time what you (pl) see.it man white village at

'When you (pl) went [to Australia] what did you see in the Europeans' towns [lit. villages]?

N: *O, gau momo idia karaia. Tau kurokuro guna idia heleva,*
O, gau momo idia karaia. Tau kurokuro guna idia hereva,
 oh thing many they make man white before they say

momo, diba las taudia, idia kwo inei aniani gaudia bouna,
momo, diba lasi taudia, idia gwau inai aniani guadia ibounai,
 many know not persons they say this food things all

ipidi bouna, wosipi ibouna, stima ibounai, tau kurokuro
ipidi ibounai, wosipi ibounai, stima ibounai, tau kurokuro
 gun all warship all boat all man white

ia kalaia las, hari be mas taudia idia karaia.
ia karaia lasi, hari be mase taudia idia karaia.
 he make not now FOCUS dead people they make

Las, mas taudia idia karaia las. Lau Nanai lau ula heleva,
Lasi, mase taudia idia karaia lasi. Lau Nanai lau ura hereva,
 no dead people they make not I Nanai I want say

<i>lau Nanai</i>	<i>Gigove,</i>	<i>lau</i>	<i>idiena</i>	<i>hanua</i>	<i>ibounai</i>	<i>lau</i>	<i>loaloo,</i>		
<i>lau Nanai</i>	<i>Gigovi</i>	<i>lau</i>	<i>idia-ena</i>	<i>hanua</i>	<i>ibounai</i>	<i>lau</i>	<i>loaloo,</i>		
I	Nanai	Gigovi	I	their	village	all	I	walk.around	
<i>lau itaia</i>	<i>gau</i>	<i>ibounai</i>	<i>idia</i>	<i>karaia.</i>	<i>Misingan</i>	<i>idia</i>	<i>karaia.</i>		
<i>lau itaia</i>	<i>gau</i>	<i>ibounai</i>	<i>idia</i>	<i>karaia.</i>	<i>Misinigani</i>	<i>idia</i>	<i>karaia.</i>		
I	see	thing	all	they	make	machine-gun	they	make	
<i>Wosipi</i>	<i>badadia</i>	<i>idia</i>	<i>karaia.</i>	<i>Plaimasisi</i>	<i>ibounai</i>	<i>idia</i>	<i>kalaia.</i>		
<i>Wosipi</i>	<i>badadia</i>	<i>idia</i>	<i>karaia.</i>	<i>Plaimasini</i>	<i>ibounai</i>	<i>idia</i>	<i>karaia.</i>		
warship	big.ones	they	make	aeroplane	all	they	make		
<i>Auri</i>	<i>idia</i>	<i>karaia.</i>	<i>Tanu</i>	<i>bona</i>	<i>auri</i>	<i>idia</i>	<i>nadua</i>	<i>idia</i>	<i>mistim.</i>
<i>Auri</i>	<i>idia</i>	<i>karaia.</i>	<i>Tano</i>	<i>bona</i>	<i>auri</i>	<i>idia</i>	<i>nadua</i>	<i>idia</i>	<i>mistim.</i>
iron	they	make	soil	and	iron	they	cook.up	they	mix.it
<i>la daikau</i>	<i>inei,</i>	<i>laidi</i>	<i>bamona.</i>	<i>Wadan</i>	<i>idia</i>	<i>bubua</i>	<i>tanika</i>	<i>dekena.</i>	
<i>la daekau</i>	<i>inai,</i>	<i>laidi</i>	<i>bamona.</i>	<i>Vadaeni</i>	<i>idia</i>	<i>bubua</i>	<i>tanika</i>	<i>dekena.</i>	
it	goes.up	this	light	like	okay	they	tip.it	tank	into
<i>Idia</i>	<i>abia</i>	<i>lau,</i>	<i>misin</i>	<i>dekena</i>	<i>idia</i>	<i>bubua</i>	<i>maraki</i>	<i>maraki.</i>	
<i>Idia</i>	<i>abia</i>	<i>lao,</i>	<i>misini</i>	<i>dekena</i>	<i>idia</i>	<i>bubua</i>	<i>maraki</i>	<i>maraki.</i>	
they	get	go	machine	into	they	tip.it	little	little	
<i>Wadain</i>	<i>misin</i>	<i>ia</i>	<i>halataia</i>	<i>ia</i>	<i>lau</i>	<i>ia</i>	<i>bada</i>	<i>herea.</i>	
<i>Vadaeni</i>	<i>misini</i>	<i>ia</i>	<i>halataia</i>	<i>ia</i>	<i>lao</i>	<i>ia</i>	<i>bada</i>	<i>herea.</i>	
okay	machine	it	makes.longer	it	go	it	big	very	
<i>la</i>	<i>gau</i>	<i>latalata.</i>	<i>Wadaini</i>	<i>idia</i>	<i>kwotua.</i>				
<i>la</i>	<i>gau</i>	<i>latalata.</i>	<i>Vadaeni</i>	<i>idia</i>	<i>kwotua.</i>				
it	thing	longish	okay	they	fasten				

'Oh, they make lots of things. The Europeans say that before there used to be a lot of people who did not know what they were talking about who used to say that all this food and all these guns and warships and boats were not made by Europeans but were being made by [our] ancestors [lit. dead people]. No, [our] ancestors do not make them. I, Nanai, want to say that I, Nanai Gigovi, visited all their towns and saw all the things they make. They make machine-guns, big warships, all the planes, iron. They cook up soil and iron and mix it up. This flares up like a light. Then they tip it into a tank. They take it and pour it into a machine a little bit at a time. Then the machine extrudes it and it comes out much longer. Then they fasten it.'

TRACK NO.2

N:	<i>Badina</i>	<i>lau</i>	<i>mai</i>	<i>be</i>	<i>Gaman</i>	<i>ia</i>	<i>bogahisi</i>	<i>maraki</i>	<i>las</i>
	<i>Badina</i>	<i>lau</i>	<i>mai</i>	<i>be</i>	<i>Gavamani</i>	<i>ia</i>	<i>bogahisi</i>	<i>maraki</i>	<i>lasi</i>
	reason	I	come	FOCUS	government	it	sad	little	not
	<i>bona</i>	<i>Ostrelya</i>	<i>taudia</i>	<i>idia</i>	<i>bogahisi</i>	<i>maraki</i>	<i>las</i>	<i>lau</i>	<i>dekena.</i>
	<i>bona</i>	<i>Ostrelya</i>	<i>taudia</i>	<i>idia</i>	<i>bogahisi</i>	<i>maraki</i>	<i>lasi</i>	<i>lau</i>	<i>dekena.</i>
	and	Australia	people	they	sad	little	not	me	to

<i>Inai dekenai</i>	<i>lau mai,</i>	<i>idiediaena</i>	<i>hanua dekenai.</i>	<i>Wadain</i>					
<i>Inai dekenai</i>	<i>lau mai,</i>	<i>idia-edia</i>	<i>hanua dekenai.</i>	<i>Vadaeni</i>					
this for	I	come their	village to	all.right					
<i>idiedia</i>	<i>gaukwreia</i>	<i>gau ibounai</i>	<i>lau itaia.</i>	<i>Wadan</i>	<i>idia</i>				
<i>idia-edia</i>	<i>gaukaraia</i>	<i>gau ibounai</i>	<i>lau itaia.</i>	<i>Vadaeni</i>	<i>idia</i>				
their	manufacture	thing all	I see	okay	they				
<i>karaia be</i>	<i>idia diba</i>	<i>momo.</i>	<i>Hahine taudia danu bona</i>						
<i>karaia be</i>	<i>idia diba</i>	<i>momo.</i>	<i>Hahine taudia danu bona</i>						
make	FOCUS	they know	much woman persons also	and					
<i>kekeni taudia danu ibounai idia gaukreia.</i>	<i>Tau idia dulua</i>								
<i>kekeni taudia danu ibounai idia gaukaraia.</i>	<i>Tau idia durua</i>								
girl	persons also	all	they manufacture	man they help					
<i>edi-- mahuta lasi hanuaboi ibounai bona dina ibounai idia</i>									
<i>edi-- mahuta lasi hanuaboi ibounai bona dina ibounai idia</i>									
sleep	not	at.night	all	and	day	all	they		
<i>gaukreia hanahana, bona badina idia laloa Papuom be</i>									
<i>gaukaraia hanaihanai bona badina idia laloa Papuom be</i>									
produce	always	and	because	they think	Papuan	FOCUS			
<i>idia be gwada lasi. Idia gau ibounai karaia diba las</i>									
<i>idia be goada lasi. Idia gau ibounai karaia diba lasi</i>									
they	FOCUS	strong	not	they thing	all	make	know	not	
<i>taudia, wadain Gavana ia bogasis, Ostrelya Gavana ia</i>									
<i>taudia, vadaeni Gavana ia bogahisi Ostrelya Gavana ia</i>									
persons	okay	governor	he	sad	Australia	governor	he		
<i>bogasisi wadain, lau mai idiediaena gaukwreia gau</i>									
<i>bogahisi vadaeni, lau mai idia-edia gaukaraia gau</i>									
sad	all.right	I	come	their	manufacture	thing			
<i>ibounai lau itaia.</i>									
<i>ibounai lau itaia.</i>									
all	I	see							

'The reason I went [lit. came] was because the Government and Australians were quite sorry for me. Consequently I went to see their towns. I saw all the things they produce. They know a lot. Women and girls as well, they all produce goods. The men help them. They don't sleep the whole night and day away; they work continuously and because [of that] they think Papuans are not strong; they do not know how to make everything. So the Governor, the Australian Governor, was sad and I went and saw all the things they produce.'

I: *Momokan?*
Momokani?
 true

'Is that true?'

N: *Io, momokan. Koikoi las. Lau hereva be momokan lau heleva.*
Io, momokani. Koikoi lasi. Lau hereva be momokani lau hereva.
 yes true false not I speak FOCUS true I speak

'Yes, that's true. It's not a lie. What I am saying is true.'

I: *Tau buruka danu ia gaukara?*
Tau buruka danu idia gaukara?
 man old also they work

'Do old men work too?'

N: *Tau buruka ia gaukwreia. Tau buruka ia noho kava las.*
Tau buruka idia gaukaraia. Tau buruka idia noho kava lasi.
 man old they produce man old they stay nothing not

Memero matamata ia sikulu dekenai ia aut ia gaukwreia,
Memero matamata idia sikulu dekenai idia aut idia gaukaraia,
 boys new they school at they out they produce

kekeni mara -- matamata ia sikulu dekenai ia aut ia
kekeni -- matamata idia sikulu dekenai idia aut idia
 girls new they school at they out they

gaukwreia. Luma badana idia kalaia, fakteli badana idia
gaukaraia. Ruma badana idia karaia, faketeri badana idia
 produce house big.one they make factory big.one they

kalaia, sitima badana idia kalaia, aniani idia kalaia, miti
karaia, sitima badana idia karaia, aniani idia karaia, miti
 make ship big.one they make food they make meat

sibona idia kalaia, gau ibounai idauidau tau kurokuro
sibona idia karaia, gau ibounai idauidau tau kurokuro
 themselves they make thing all different man white

sibona idia kalaia. Tau ta ia kalaia las, ibounai
sibona idia karaia. Tau ta ia karaia lasi, ibounai
 themselves they make man one he make not all

sibodia, ibounai idia-- imana lalonai gau ibounai ia
sibodia, ibounai idia-- imana lalonai gau ibounai idia
 only all they hand in thing all they

wara. Idia sibona idia kalaia.
vara. Idia sibona idia karaia.
 born they alone they make

'Old men produce. Old men don't just do nothing. Young boys leave school to [help] produce. Young girls leave school to [help] produce. They make big buildings, big factories, big ships, food and all different kinds of things like meat are produced by Europeans themselves. One man alone doesn't do it; it's done by everyone--everything is produced by hard work [lit. in the hand].'

I: *Guna be las. Tau kurokuro ia ura las tuari.*
Guna be lasi. Tau kurokuro idia ura lasi tuari.
 before FOCUS not man white they want not fight

'Before it wasn't like that. Europeans didn't want to fight.'

N: *Io, guna be tau kurokuro be ia ura las tuari,*
Io, guna be tau kurokuro be idia ura lasi tuari,
 yes before FOCUS man white FOCUS they want not fight

badina be Diapan se idia stat.

badina be Diapani ese idia stati.

reason FOCUS Japan SUBJECT.MARKER they start.

'Yes, Europeans didn't want to fight at first because the Japanese started it.'

I: *la hunia?*
Idia hunia?
 they hide

'They kept it a secret?'

N: *la hunia, idia koia. "Omi naria dohore ai mai."*
Idia hunia, idia koia. "Umui naria dohore ai mai."
 they hide they tell.lie they wait later we (excl) come

Wadain tau kurokuro be idia daradara idia diba
Vadaeni tau kurokuro be idia daradara idia diba
 okay man white FOCUS they confused they know

las idia kwo be, "Diapan ia koikoi." Wadain Diapan ia
lasi idia gwau be, "Diapani ia koikoi." Vadaeni Diapani ia
 not they say FOCUS Japan it tell.lies okay Japan it

stati guna, ia mai wadain bomu ia negea Hanuabada
stati guna, ia mai vadaeni bomu ia negea Hanuabada
 start first it come okay bomb it throw Hanuabada

dekena. Wadain tau kurokuro be ia hoa. "Io, omi
dekena. Vadaeni tau kurokuro be idia hoa. "Io, umui
 upon okay man white FOCUS they surprised yes you (pl)

kalaia inei? Wa, dohore!" Wadain, Ostrelya ibounai idia
karaia inai? Vada, dohore!" Vadaeni, Ostrelya ibounai idia
 make now okay later okay Australia all they

heleva, "Dohore! Oi naria!" Wadain, idia gau ibounai idia
hereva, "Dohore! Oi naria!" Vadaeni, idia gau ibounai idia
 say later you wait okay they thing all they

kalaia inei. Faketli idia kalaia, bona edi gaukwreia
karaia inai. Faketeri idia karaia, bona edia gaukaraia
 make now factory they make and their produce

idauidau idia kalaia.
idauidau idia karaia.
 different they make

'They kept it a secret. They told lies. [They said,] "You (pl) wait, we're coming." But the Europeans were confused. They didn't take any notice and said, "Japan is tricking us." But Japan did start it. They came and bombed Hanuabada. Then the Europeans were surprised and said, "So you are really doing it! Okay, you wait [you'll pay for it]." Then all Australia said, "You wait." Then they set to to make all the things. They made factories and produced different kinds of things.

I: *Tau kurokuro haida guna ia noho Papua, ia lau Ostrelya.*
Tau kurokuro haida guna idia noho Papua, idia lao Ostrelya.
 man white some before they stay Papua they go Australia

Ia gaukara danu?
Idia gaukara danu?
 they work too

'Some Europeans who used to be in Papua before went to Australia and worked too, did they?'

N: *Ibounai idia gaukela Ostrelya dekena.*
Ibounai idia gaukara Ostrelya dekena.
 All they work Australia in

'Everybody in Australia works.'

I: *Oi davaria?*
Oi davaria?
 you find

'Did you see [lit. find] them?'

N: *Lau davaridia.*
Lau davaridia.
 I find.them

'I saw them.'

I: *Da:ka ia hereva?*
Dahaka idia hereva?
 what they say

'What did they say?'

N: *Lau davaridia idia kou, "O, badina hari be inei Diapan*
Lau davaridia idia gwau, "O, badina hari be inai Diapani
 I found.them they say oh reason how FOCUS this Japan

se idia mai idia gabu idia tuari bomua
ese idia mai idia gabu idia tuari bomua
 SUBJECT.MARKER they come they place they fight bomb

<i>dekena.</i>	<i>Wadain</i>	<i>ai</i>	<i>danu</i>	<i>ai</i>	<i>stanibai</i>	<i>aiemai</i>			
<i>dekena.</i>	<i>Vadaeni</i>	<i>ai</i>	<i>danu</i>	<i>ai</i>	<i>stanibai</i>	<i>aiemai</i>			
with	okay	we (excl)	also	we (excl)	stand.by	our (excl)			
<i>gau</i>	<i>ibounai</i>	<i>ai</i>	<i>karaia</i>	<i>inei.</i>	<i>Wadain</i>	<i>ai</i>			
<i>gau</i>	<i>ibounai</i>	<i>ai</i>	<i>karaia</i>	<i>inai.</i>	<i>Vadaeni</i>	<i>ai</i>			
thing	all	we (excl)	make	now	okay	we (excl)			
<i>boiboi,</i>	<i>"Oi</i>	<i>mai</i>	<i>inei</i>	<i>gau</i>	<i>ibounai</i>	<i>oi</i>	<i>itaia</i>	<i>badina</i>	<i>oi</i>
<i>boiria,</i>	<i>"Oi</i>	<i>mai</i>	<i>inai</i>	<i>gau</i>	<i>ibounai</i>	<i>oi</i>	<i>itaia</i>	<i>badina</i>	<i>oi</i>
call.out	you	come	this	thing	all	you	see	reason	you
<i>diba</i>	<i>lasi,</i>	<i>Gavana</i>	<i>ia</i>	<i>bogasisi</i>	<i>oi</i>	<i>dekena."</i>	<i>Inei</i>	<i>dekena</i>	
<i>diba</i>	<i>lasi,</i>	<i>Gavana</i>	<i>ia</i>	<i>bogahisi</i>	<i>oi</i>	<i>dekena."</i>	<i>Inai</i>	<i>dekena</i>	
know	not	Governor	he	sad	you	for	this	for	
<i>ai</i>	<i>boiboi,</i>	<i>"Oi</i>	<i>mai."</i>	<i>Wadain</i>	<i>oi</i>	<i>mai</i>	<i>loaloo</i>	<i>inei</i>	
<i>ai</i>	<i>boiria,</i>	<i>"Oi</i>	<i>mai."</i>	<i>Vadaeni</i>	<i>oi</i>	<i>mai</i>	<i>loaloo</i>	<i>inai</i>	
we (excl)	call.out	you	come	okay	you	come	walk.around	this	
<i>gau</i>	<i>ibounai</i>	<i>oi</i>	<i>itaia</i>	<i>luma</i>	<i>badadia,</i>	<i>bona,</i>	<i>gaukwreia</i>		
<i>gau</i>	<i>ibounai</i>	<i>oi</i>	<i>itaia</i>	<i>ruma</i>	<i>badadia,</i>	<i>bona,</i>	<i>gaukaraia</i>		
thing	all	you	see	house	big.ones	and	produce		
<i>idauidau</i>	<i>oi</i>	<i>itaia.</i>	<i>Paramaisi</i>	<i>oi</i>	<i>itaia."</i>	<i>Praimisi</i>	<i>danu</i>		
<i>idauidau</i>	<i>oi</i>	<i>itaia.</i>	<i>Paraimisini</i>	<i>oi</i>	<i>itaia."</i>	<i>Praimisini</i>	<i>danu</i>		
different	you	see	aeroplane	you	see	aeroplane	also		
<i>lau</i>	<i>ura</i>	<i>ta(?)</i>	<i>lau</i>	<i>daikau.</i>	<i>la</i>	<i>namo...</i>	[end of recording].		
<i>lau</i>	<i>ura</i>	<i>ta(?)</i>	<i>lau</i>	<i>daekau.</i>	<i>la</i>	<i>namo...</i>			
I	want	one(?)	I	go.up	that	good...			

'When I met them they said, "Oh, the reason is that Japan came and bombed the place so we are getting ready to produce all our own things. So we sent word for you to [come and] see all these things because you did not know about what we are doing; the Governor was sorry for you. Consequently we sent word for you to come. So you've come and been around and seen all these things-- big buildings and different kinds of operations/works. You've seen planes. I wanted to go up in one (?). That's fine..."'

TRACK NO.3

I:	<i>Guna</i>	<i>tau</i>	<i>kurokuro</i>	<i>ia</i>	<i>tauri</i>	<i>ura</i>	<i>las.</i>	<i>la</i>	<i>omui</i>	<i>sibona</i>
	<i>Guna</i>	<i>tau</i>	<i>kurokuro</i>	<i>ia</i>	<i>tuari</i>	<i>ura</i>	<i>lasi.</i>	<i>la</i>	<i>umui</i>	<i>sibona</i>
	before	man	white	he	fight	want	not	he	you (pl)	only
	<i>ia</i>	<i>naria,</i>	<i>momokan</i>	<i>o</i>	<i>las?</i>					
	<i>ia</i>	<i>naria,</i>	<i>momokani</i>	<i>o</i>	<i>lasi?</i>					
	he	look.after	true		or not					

'Europeans did not want to fight at first/before. They only wanted to look after you [Papuaans] didn't they?'

- N: *Io, momokan. Idia be idia ura las tuari.*
Io, momokani. Idia be idia ura lasi tuari.
 yes true they FOCUS they want not fight
 'Yes, that's true. They did not want to fight.'
- I: *Oi itaia uma gabuna?*
Oi itaia uma gabuna?
 you see garden place
 'Did you see agricultural areas [lit. gardens]?'
- N: *Io, uma gabuna lau itaia. Idia karaia plaua be idia*
Io, uma gabuna lau itaia. Idia karaia plaua be idia
 yes garden place I see they make bread FOCUS they
karaia, raisi idia karaia, guna idia gaukwrei.
karaia, raisi idia karaia, guna idia gaukaraia.
 make rice they make before they manufacture
 'Yes, I saw the agricultural areas. They make bread and rice. They produced it before.'
- I: *Mamoi momo?*
Mamoi momo?
 sheep many
 'Were there many sheep?'
- N: *Io, mamoi momo, bolomakau momo, sipi momo.*
Io, mamoi momo, boromakau momo, sipi momo.
 yes sheep many cattle many sheep many
 'Yes, there were lots of sheep and cattle.'
- I: *Ia tuari taudia las?*
Ia tuari taudia lasi?
 they war people not
 'They're not warmongers, are they?'
- N: *Las, ia ura las tuari. Badina ia be taunimanim*
Lasi, ia ura lasi tuari. Badina ia be taunimanim
 no they want not fight reason they FOCUS people
momo las. Wadaini hanua be toi bamona. Namba wan
momo lasi. Vadaeni hanua be toi bamona. Namba wan
 many not all.right village FOCUS three like number one
be Taunsvolo. Wadaini seken, be Bulispen. Wadain,
be Taunsvolo. Vadaeni seken, be Burisbeni. Vadaeni
 FOCUS Townsville okay second FOCUS Brisbane okay
ia mai Sidin. Vadain ia mai insini be Ostrelya.
ia mai Sidini. Vadaeni ia mai inisini be Ostrelya.
 it come Sydney okay it come here FOCUS Australia

'No, they did not want to fight because there are not many of them. There are only about three [main] towns. The first one is Townsville, the second Brisbane and the other one Sydney. And that's Australia.'

- I: *Kone dekena sibona hanua ia no:?*
Kone dekena sibona hanua ia noho?
 beach on only village they stay

'The towns are only situated on the coast are they?'

- N: *Kone dekenai hanua ia no: bona inei uda ibounai*
Kone dekenai hanua ia noho bona inai uda ibounai
 beach on village they stay and this bush all
- lau mai itaia be o::, inei hanua bada herea inei uda*
lau mai itaia be o::, inai hanua bada herea inai uda
 I come see FOCUS oh:: this village big very this bush
- ibounai hanua kavakava. Tauni kavakava. Tauni be maraki*
ibounai hanua kavakava. Tauni kavakava. Tauni be maraki
 all village all.over town all.over town FOCUS small
- las. Inei ladana ia bada be hanua toi dekena a--*
lasi. Inai ladana ia bada be hanua toi dekena a--
 not. this name they big FOCUS village three at ah--
- hanua ibounai be lau itaia be momo helea*
hanua ibounai be lau itaia be momo herea
 village all FOCUS I see FOCUS many very
- taunimanima momo helea. Tau momo, kekeni momo, hahine*
taunimanima momo herea. Tau momo, kekeni momo, hahine
 people many very man many girl plenty woman
- momo, taunimanima momo helea, helevana karaia las.*
momo, taunimanima momo herea, herevana karaia lasi.
 many people many very talk make not

'[Yes] the towns are on the coast but [lit. and] oh, there are lots of them in the bush that I saw. Towns all over the place, and not small ones either. The best known ones are the three ah--, there are lots and lots of towns and people that I saw. Lots of men, girls, and women. Lots of people. There's no doubt about it.'

- I: *Oi itaia wadain?*
Oi itaia vadaeni?
 you see completed

'You saw them did you?'

- N: *Lau itaia wadaini, laegu matana dekena. Lau diba ibounai.*
Lau itaia vadaeni, laegu matana dekena. Lau diba ibounai.
 I see completed my eye with I know all

'I saw them with my own eyes. I know them all.'

I: *Oi daika?*
Oi daika?
 you who

'Who are you?'

N: *Lau Nanai. Lau Nanai Gigove, lau diba ibounai.*
Lau Nanai. Lau Nanai Gigovi, lau diba ibounai.
 I Nanai I Nanai Gigovi I know all

'I am Nanai, Nanai Gigovi. I know everything.'

I: *Faktri danu?*
Faketeri danu?
 factory also

'Factories too?'

N: *Faketeli momo. Idia karaia badadia.*
Faketeri momo. Idia karaia badadia.
 factory many they make big.ones

'[Yes] many factories. They make big ones.'

I: *Hadibaia gauna?*
Hadibaia gauna?
 teach thing

'[and] educational things?'

N: *Yes, gau ibounai. Momo herea.*
Io, gau ibounai. Momo herea.
 yes thing all many very

'Yes, everything. Lots and lots.'

I: *Inei ruma-- hadibaia ruma-- skul...*
Inai ruma-- hadibaia ruma-- skul...
 this house teach house school

'This house-- school house-- school...'

N: *Hadibaia luma, wailisi dekena idia sikulu luma badadia*
Hadibaia ruma, wailisi dekena idia sikulu ruma badadia
 teach house wireless about they school house big.ones

bona plaimisi dekenai sikulu luma badadia nao
bona plaimisini dekenai sikulu ruma badadia nao
 and aeroplane about school house big.ones European

fakteli badadia idia kalaia. Plaimasi idia abia lau
faketeri badadia idia karaia. Plaimasini idia abia lao
 factory big.ones they make aeroplane they get go

luma lalonai dekena idia karaia inisini idia sikulu.
ruma lalonai dekena idia karaia iniseni idia sikulu.
 house inside at they make here they school

'[Yes] they've built big schools to teach about wirelesses/radios in and about planes and big European factories. They have schools in hangars where they house and make planes.'

I: *Japan taudia ia stat. Tau kurokuro ia ura las*
Diapani taudia idia stat. Tau kurokuro idia ura lasi
 Japan persons they start man white they want not

tuari, ia diba las. Ia sikul wadain?
tuari, idia diba lasi. Idia sikulu vadaeni?
 fight they know not they school completed

'The Japanese started it [the war]. The Europeans didn't want to fight. They weren't prepared [lit. didn't know]. They've now been brought up to scratch [lit. educated] have they?'

N: *Nou, Diapani be ia sikulu guna. Inei tau kurokuro be*
Lasi, Diapani be idia sikulu guna. Inai tau kurokuro be
 no Japan FOCUS they school first this man white FOCUS

ia sikulu las. Ia hari be ia hekula.
idia sikulu lasi. Idia hari be idia hekure.
 they school not they now FOCUS they lie.down

'No, the Japanese were prepared first [lit. went to school first]. These Europeans weren't prepared. They're still at a disadvantage [lit. lying down].'

I: *Hari ia skul?*
Hari idia skul?
 now they school

'They're training now are they?'

N: *Hari ia sikulu, ia tuari gaukwreia be kahana ia*
Hari idia sikulu, idia tuari gaukaraia be kahana idia
 now they schol they fight produce FOCUS side they

karaia hari ia sikulu haida be matamata, ia diba las.
karaia hari idia sikulu haida be matamata, idia diba lasi.
 make now they school some FOCUS new they know not

Diba taudia wadain idia lau wadain tuari gabuna. Inei
Diba taudia vadaeni idia lao vadaeni tuari gabuna. Inai
 know persons okay they go completed fight place this

bamona ia karaia tau kurokuro be. Diba taudia idia lau
bamona idia karaia tau kurokuro be. Diba taudia idia lao
 like they make man white FOCUS know persons they go

ipidi badadia dekenai idiediena gabu (?).
ipidi badadia dekenai idia-edia gabu (?)
 gun big.ones with their place (?)

'Now they're getting prepared. Part of the preparations for war are: those who have been trained [lit. know] have gone to the war. They have gone with their big weapons. Some of those still being trained are new [recruits] and don't know anything.'

- I: *Diba taudia ia hadibaia ia instrakta bamona ia skul?*
Diba taudia idia hadibaia idia instrakta bamona idia sikulu?
 know persons they teach they instructor like they school

'Those who know [about war] act as instructors do they?'

- N: *Io, inei bamona idia sieia. Diba taudia be ia sieia. Diba*
Io, inai bamona idia siaia. Diba taudia be idia siaia. Diba
 yes this like they send know persons FOCUS they send know
las taudia ia lau emu gabu ia abia inei bamona.
lasi taudia idia lao idia-edia gabu idia abia inai bamona.
 not persons they go their place they take this like
Diba taudia idia lau gaukara. Diba las taudia idia lau sikulu.
Diba taudia idia lao gaukara. Diba las taudia idia lao sikulu.
 know persons they go work know not persons they go school

'Yes, they send them like this. Those who are trained are sent off and those who aren't trained take their places. Those who are trained go and work. Those who are not go to schools.'

- I: *Oi helai tren dekena? Oi lau lau::: uta dekena oi davaria?*
Oi helai tereni dekena? Oi lao lao::: uda dekena oi davaria?
 you sit train in you go go::: bush in you find

'You went by train didn't you? You went a long way into the bush and found them [camps] did you?'

- N: *O tlen dekenai lau lau::: uda dekenai inei kempa ibounai*
O treni dekenai lau lao::: uda dekenai inai kempa ibounai
 oh train in I go::: bush in this camp all
inei tau kurokuro kavakava, ami solodia. Solodia momo herea.
inai tau kurokuro kavakava, ami solodia. Solodia momo herea.
 this man white all.over army soldier soldier many very

'Oh yes, I went a very long way into the bush to these camps where there were Europeans all over the place, army soldiers. There were lots and lots of soldiers.'

- I: *Uma gabuna daika ia naria?*
Uma gabuna daika ia naria?
 garden place who he look.after

'Who was looking after the farms?'

- N: *O uma gabuna be taunimanima haida idia gaukwreia haida*
O uma gabuna be taunimanima haida idia gaukaraia haida
 oh garden place FOCUS people some they work some

be idia lau tuari dekenai.
 be idia lao tuari dekenai.
 FOCUS they go fight to

'Oh, there were some people working on the farms. Others went off to the war.'

TRACK NO.4.

I: [Tau kuro] kuro guna ia no: Papua ia mai Sidni?
 [Tau kuro] kuro guna idia noho Papua idia mai Sidini?
 man white before they stay Papua they come Sydney

'Did those Europeans that were in Papua before go to Sydney?'

N: Ibounai idia mai wadain Sidin dekena.
 Ibounai idia mai vadaeni Sidini dekena.
 all they come completed Sydney to

'They all went to Sydney.'

I: Oi itaia wadain?
 Oi itaia vadaeni?
 you see completed

'You saw them?'

N: Lau itaia wadain.
 Lau itaia vadaeni.
 I see completed

'I saw them.'

I: Ia itaia oi ia bogasisi?
 Idia itaia oi idia bogahisi?
 they see you they sad

'Were they sad when they saw you?'

N: O, ia bogasisi bada herea.
 O, idia bogahisi bada herea.
 oh they sad big very

'Oh, they were very sad.'

I: Da:ka ia hereva?
 Dahaka idia hereva?
 what they say

'What did they say?'

N: Inei guna Gavana tauna, Papua ibounai ia naria
 Inai guna Gavana tauna, Papua ibounai ia naria
 this former Governor person Papua all he look.after

Gavana Mare, lau davaria Sidini dekena. O, ia bogahisi
 Gavana Mari, lau davaria Sidini dekena. O, ia bogahisi
 Governor Murray I find Sydney at oh he sad
 maraki las. Ai memero ibounai, siksi, ia imana heudeheude.
 maraki lasi. Ai memero ibounai, sikisi, ia imana heudeheude.
 little not we (excl) boys all six he hand shake

'I met Governor Murray in Sydney. He was the one that used to look after all of Papua before. Oh, he was very [lit. not a little] sad and shook our, we six boys', hands.'

I: Ia hereva gabeai solodia momo ia daikau?
 Ia hereva gabeai solodia momo idia daekau?
 he say later soldier many they come/go.up

'Did he say that later there would be plenty of soldiers coming/going up [to Papua]?

N: Momo ia siaia ia daikau ia heleva.
 Momo ia siaia idia daekau ia hereva.
 many he send they come/go.up he say

'He said that he'd sent a lot up.'

I: Oi lalao da:ka? Japan taudia hegeregere o English ia hegeregere?
 Oi lalao dahaka? Diapani taudia hegeregere o Inglisi idia hegeregere?
 you think what Japan persons equal or English they equal

'Do you think the Japanese or the English will be supreme [lit. equal to the task]?'

N: O, lau lalao be Inglisi be momo herea, Diapan be
 O, lau lalao be Inglisi be momo herea, Diapani be
 oh, I think FOCUS English FOCUS many very Japan FOCUS
 lau diba las, sedila Diapan do:re ia habadoua.
 lau diba lasi, sedira Diapani dohore idia habadoua.
 I know not perhaps Japan later they pile.up

'Oh, I think the English have a lot of men. As for the Japanese I don't know. They will probably build up their forces.'

I: Inglisi gauna hegeregere?
 Inglisi gauna hegeregere?
 English thing equal

'Are the English equipped well enough?'

N: Ingilisi be gau ibounai hegelegele wadaini lau itaia
 Ingilisi be gau ibounai hegeregere vadaeni lau itaia
 English FOCUS thing all equal completed I see
 lauegu matana dekena.
 lauegu matana dekena.
 my eye with

'The English have everything equal to the task. I have seen that with my own eyes.'

I: *Gau be da:ka?*
Gau be dahaka?
 thing FOCUS what

'What sorts of things?'

N: *Gau be inei, ipidi, bona bomu idia karaia. Bomu be*
Gau be inai, ipidi, bona bomu idia karaia. Bomu be
 thing FOCUS this gun and bomb they make bomb FOCUS

idia karaia idia nadua. Idia udeia lahi dekenai ia auka
idia karaia idia nadua. Idia udaia lahi dekenai ia auka
 they make they cook they put.in fire in it hard

masemase wadain idia abia maileia idia utua. Hapu be
masemase vadaeni idia abia mailaia idia utua. Hapu be
 really okay they get bring they cut half FOCUS

idia nekea. Wadain a-- duduna be bomu idia kalaia.
idia negea. Vadaeni a-- duduna be bomu idia karaia.
 they throw.out okay ah-- end FOCUS bomb they make

'These things: guns and bombs. When they make bombs they cook [metal]. They put it in a fire. When it is really hard they bring it [out] and cut it. They discard half and make bombs out of the remainder [lit. the end].'

I: *Eroplain?*
Eropleni?
 aeroplane

'Aeroplanes?'

N: *O, eloplen danu idia karaia, ipidi gaudia. Eloplen ta*
O, eroplени danu idia karaia, ipidi gaudia. Eroplen ta
 oh aeroplane also they make gun things aeroplane one
be idia karaia. Injini lasi.
be idia karaia. Injini lasi.
 FOCUS they make engine not

'Oh, they make aeroplanes too. Weapons. They make one [kind of] aeroplane that has no engine in it.'

I: *A!*
A!
 ah

'Is that so?'

N: *Injini lasi. Gunaguna be injini danu. Hari be idia*
Injini lasi. Gunaguna be injini danu. Hari be idia
 engine not formerly FOCUS engine also now FOCUS they

<i>karaia</i>	<i>tau</i>	<i>kurokuro</i>	<i>idia</i>	<i>aunega</i>	<i>matamata</i>	<i>idia</i>	<i>davaria.</i>			
<i>karaia</i>	<i>tau</i>	<i>kurokuro</i>	<i>idia</i>	<i>aonega</i>	<i>matamata</i>	<i>idia</i>	<i>davaria.</i>			
make	man	white	they	wisdom	new	they	find			
<i>Idia</i>	<i>kou,</i>	"O,	<i>bensini</i>	<i>be</i>	<i>halusia</i>	<i>momo</i>	<i>plaimisi</i>			
<i>Idia</i>	<i>gwau,</i>	"O,	<i>bensini</i>	<i>be</i>	<i>halusia</i>	<i>momo</i>	<i>plaimisini</i>			
they	say	oh	benzin	FOCUS	cause.lose	plenty	aeroplane			
<i>ibounai</i>	<i>dekena."</i>	<i>Harihari</i>	<i>be</i>	<i>idia</i>	<i>karaia</i>	<i>matamata.</i>	<i>Wa</i>			
<i>ibounai</i>	<i>dekena."</i>	<i>Harihari</i>	<i>be</i>	<i>idia</i>	<i>karaia</i>	<i>matamata.</i>	<i>Vada</i>			
all	in		right.now	FOCUS	they	make	new	okay		
<i>inei</i>	<i>ia</i>	<i>ura</i>	<i>ololo</i>	<i>dekenai</i>	<i>ia</i>	<i>dihō</i>	<i>negana</i>	<i>inei</i>		
<i>inai</i>	<i>idia</i>	<i>ura</i>	<i>ororo</i>	<i>dekenai</i>	<i>idia</i>	<i>dihō</i>	<i>negana</i>	<i>inai</i>		
this	they	want	hill	on	they	go.down	time	this		
<i>plaimisi</i>	<i>be,</i>	<i>sibona</i>	<i>ia</i>	<i>heau</i>	<i>ia</i>	<i>injini</i>	<i>lasi,</i>			
<i>plaimisini</i>	<i>be,</i>	<i>sibona</i>	<i>ia</i>	<i>heau</i>	<i>ia</i>	<i>injini</i>	<i>lasi,</i>			
aeroplane	FOCUS	self	it	run	it	engine	not			
<i>wadain</i>	<i>manu</i>	<i>bamona</i>	<i>ia</i>	<i>toreisi</i>	<i>ia</i>	<i>daikau,</i>	<i>daikau,</i>	<i>o</i>		
<i>vadaeni</i>	<i>manu</i>	<i>bamona</i>	<i>ia</i>	<i>toreisi</i>	<i>ia</i>	<i>daekau,</i>	<i>daekau,</i>	<i>o</i>		
okay	bird	like	it	get.up	it	go.up	go.up	oh		
<i>wadain</i>	<i>ia</i>	<i>heau.</i>	<i>O,</i>	<i>nega</i>	<i>haida</i>	<i>ia</i>	<i>ura</i>	<i>heau</i>	<i>negana,</i>	<i>ia</i>
<i>vadaeni</i>	<i>idia</i>	<i>heau.</i>	<i>O,</i>	<i>nega</i>	<i>haida</i>	<i>idia</i>	<i>ura</i>	<i>heau</i>	<i>negana,</i>	<i>idia</i>
okay	they	run	oh	time	some	they	want	run	time	they
<i>motuka</i>	<i>se</i>			<i>ia</i>	<i>be</i>	[cut off]				
<i>motuka</i>	<i>ese</i>			<i>ia</i>	<i>be</i>	[cut off]				
car	SUBJECT.MARKER			it	FOCUS					

'There's no engine. Previously they had engines too. Now the Europeans have discovered a new idea. They said, "Oh, [the old planes] used to consume too much petrol." Now they're making a new one which has no engine and which when they're up on a hill and want to take off the plane just runs by itself. It takes off like a bird and goes up and up and then off it goes. Oh, sometimes when they want to fly then [they tow them up with (?)] motorcars...'

TRACK NO.5

I: *Po:t* *Mo:sbi* *oi* *lakatania* *edesini* *oi* *mai?*
Pot *Mosbi* *oi* *rakatania* *edeseni* *oi* *mai?*
Port Moresby you left where you come

'When you left Port Moresby where did you go?'

N: *Pos* *Mosbi* *lau* *lau* *lakatania* *wosipi* *dekenai* *lau* *mai*
Pot *Mosbi* *lau* *lao* *rakatania* *wosipi* *dekenai* *lau* *mai*
Port Moresby I go leave warship in I come

hanuaboi *rua,* *dina* *rua* *bona* *hap,* *lau* *mai* *Taunsvolo*
hanuaboi *rua,* *dina* *rua* *bona* *hapu,* *lau* *mai* *Taunsvolo*
night two day two and half I come Townsville

<i>lau itaia.</i>	<i>Lau mai be</i>	<i>lau Taunsvolo</i>	<i>lau itaia be</i>
<i>lau itaia.</i>	<i>Lau mai be</i>	<i>lau Taunsvolo</i>	<i>lau itaia be</i>
I see	I come	FOCUS I	Townsville I see FOCUS
<i>o: gabu bada herea,</i>	<i>Hanuabada be</i>	<i>malakimalaki.</i>	<i>Inei</i>
<i>o: gabu bada herea,</i>	<i>Hanuabada be</i>	<i>marakimaraki.</i>	<i>Inai</i>
oh place big very	Hanuabada FOCUS	minute	this
<i>taunimanima be</i>	<i>miri bada--</i>	<i>miri bamona.</i>	<i>Momo herea.</i>
<i>taunimanima be</i>	<i>miri bada--</i>	<i>miri bamona.</i>	<i>Momo herea.</i>
people	FOCUS sand big--	sand like	many very
<i>Hanua be</i>	<i>maraki las.</i>	<i>Wadain lau mai</i>	<i>Taunsvolo dekenai</i>
<i>Hanua be</i>	<i>maraki lasi.</i>	<i>Vadaeni lau mai</i>	<i>Taunsvolo dekenai</i>
village FOCUS	small not	okay I come	Townsville to
<i>lau heau tlen dekenai.</i>	<i>Wadain hanua</i>	<i>ibounai uda</i>	<i>inei</i>
<i>lau heau treni dekenai.</i>	<i>Vadaeni hanua</i>	<i>ibounai uda</i>	<i>inai</i>
I run train in	okay village	all bush	this
<i>tau kurokuro uda inei dala tlen dala dekenai be o:</i>			
<i>tau kurokuro uda inai dald treni dala dekenai be o:</i>			
man white bush this road train road on			FOCUS oh
<i>hanua momo herea ia mai mai mai::: bona Bulispen ia</i>			
<i>hanua momo herea ia mai mai mai::: bona Burisbeni ia</i>			
village many very it come come come:::		and	Brisbane it
<i>abia. Wadain Bulispeni lau itaia be lau heleva las.</i>			
<i>abia. Vadaeni Burisbeni lau itaia be lau hereva lasi.</i>			
get okay Brisbane I see FOCUS I say			not
<i>Inei taunimanima malaki las, mili momokan. Tau kulokulo</i>			
<i>Inai taunimanima maraki lasi, miri momokani. Tau kurokuro</i>			
this people small not sand true			man white
<i>momo herea. A, luma be ita koleia lasi bona</i>			
<i>momo herea. A, ruma be ita gwauraia lasi bona</i>			
many very ah house FOCUS we (incl) talk.about			not and
<i>taunimanima ibounai lau koleia lasi. Momo herea.</i>			
<i>taunimanima ibounai lau gwauraia lasi. Momo herea.</i>			
people	all I talk.about	not many	very

'We left Port Moresby in a warship and spent two nights, two and a half days [in it] before we got to Townsville. When I saw Townsville I was surprised at how big it was. Hanuabada is minute by comparison. These people are as numerous as grains of sand. [There are] lots and lots [of them]. The towns are quite big [lit. not small]. Then I went by train. There are lots and lots of towns along the way and in the bush until one reaches Brisbane. Then when I saw Brisbane I was overawed. There's so many people there, they're really like sand. Lots and lots of Europeans. Ah, I can't tell you how many houses and how many people there are. Lots and lots.'

I: *Tau kurokuro ia itaia oi ia dagidagi o las?*
Tau kurokuro ia itaia oi ia dagedage o lasi?
 man white he see you he hostile or not

'The Europeans that saw you, were they hostile or not?'

N: *Las, tau kurokuro idia dagidagi lasi lau dekenai.*
Lasi, tau kurokuro idia dagedage lasi lau dekenai.
 no man white they hostile not me to

Idia henia luma namona idia henia aniani namona,
Idia henia ruma namona idia henia aniani namona,
 they give house good.one they give food good.one

idia hanamoa bada herea lau dekena, lauegu sinana
idia hanamoa bada herea lau dekena, lauegu sinana
 they make.pleasant big very me to my mother

bamona bona lauegu tamana bamona. Ia naria namo herea.
bamona bona lauegu tamana bamona. Idia naria namo herea.
 like and my father like they look.after good very

Ia aniani ia henia namonamo.

Idia aniani idia henia namonamo.
 they food they give carefully

'No, they were not hostile. They gave me good lodgings, good food and they made everything very pleasant for me. They were like my mother and father to me. They looked after me very well. They were full of care in giving me food.'

I: *Inei taunimanima momo da:ka ia ania?*
Inai taunimanima momo dahaka idia ania?
 this people many what they eat

'What do all those people eat?'

N: *O, idia be aniani momo, miti momo, bona aniani*
O, idia be aniani momo, miti momo, bona aniani
 oh they FOCUS food plenty meat plenty and food

idauidau idiedia uma gabuna idia karaia aniani
idauidau idia-edia uma gabuna idia karaia aniani
 different.kinds their garden place they make food

namodia idia karaia. Aniani namona idia ania.

namodia idia karaia. Aniani namona idia ania.
 good.ones they make food good.one they eat

'Oh, they eat lots of foods, lots of meat and all different kinds of food which they produce in their gardens. They produce good foods and eat good food.'

I: *Misi ia araia gabuna oi davaria?*
Miti idia alaia gabuna oi davaria?
 meat they kill place you find

'Did you get to see an abattoir?'

N: *Lau diba lau lau misi nadua gabuna lau itaia. Misi alaia*
Lau diba lau lao miti nadua gabuna lau itaia. Miti alaia
 I know I go meat cook place I see meat kill

gabuna lau diba lau itaia. Mitiinei idia karaia tini dekena
gabuna lau diba lau itaia. Miti inai idia karaia tini dekena
 place I know I see meat this they make tin in

lau itaia lauegu matana dekenai, fakteli bada herea.
lau itaia lauewgu matana dekenai, faketeri bada herea.
 I see my eye with factory big very

'I know it. I went to see an abattoir. I know the place where they kill cattle. I saw it. I saw the big factory where they put the meat in tins. I saw it with my own eyes.'

I: *Edena bamona ia karaia?*
Edena bamona idia karaia?
 what like they make

'How do they make it?'

N: *O, inei be idia alaia abia malaia wadain idia evaia*
O, inai be idia alaia abia malaia vadaeni idia evaia
 oh this FOCUS they kill get bring okay they cut.up

kopina idia kopaia, wadain so dekenai idia silia, ivaia
kopina idia kopaia, vadaeni so dekenai idia siria, ivaia
 skin they take.off okay saw with they slice sever

maraki maraki, hapu idia sieia ami dekena hapu be inei
maraki maraki, hapu idia siaia ami dekena hapu be inai
 small small half they send army to half FOCUS this

bamona a-- momo herea be ia nadua. Tini dekenai ia
bamona a-- momo herea be idia nadua. Tini dekenai idia
 like ah-- much very FOCUS they cook tin in they

kalaia wadain tin dekenai ia udaia wada idia siaia inei,
karaia vadaeni tini dekenai idia udaia vada idia siaia inai,
 make okay tin in they put.in okay they send now

taunimanima idia ania bona idia hoihoi Hanuabada dekena.
taunimanima idia ania bona idia hoihoi Hanuabada dekena.
 people they eat and they buy Hanuabada in

Lau itaia wadain.
Lau itaia vadaeni.
 I see completed

'Oh, like this. They kill and bring the cattle in. Then they cut them up, skin them and cut them up into small pieces with a saw. They send half to the army and the other half they do this with it ah-- they cook lots and lots. They make the tins and then they put the meat in them. Then they send them off. People eat it and they buy it in Hanuabada. I've seen it.'

I: *Brisben dekena solodia ia no:?*
Burisbeni dekena solodia idia noho?
 Brisbane at soldier they stay

'Are there soldiers at Brisbane?'

N: *O, inei solodia kavakava. Inei uda ibounai solodia, a--*
O, inai solodia kavakava. Inai uda ibounai solodia, a--
 oh this soldier all.over this bush all soldier ah--
Bulispeni be solodia malaki las.
Burisbeni be solodia maraki lasi.
 Brisbane FOCUS soldier little not

'Oh, there are soldiers all over the place. Soldiers in all the bush and ah-- there are hordes in Brisbane [lit. now a few].'

TRACK NO.6

I: *Brisben dekena solodia oi davaria, momo a? Daika ena?*
Burisbeni dekena solodia oi davaria, momo a? Daika ena?
 Brisbane at soldier you find many eh who its

'So you came upon lots of soldiers in Brisbane did you? Whose were they?'

N: *Solodia momo herea inei be solodia kavakava.*
Solodia momo herea inai be solodia kavakava.
 soldier many very this FOCUS soldier all.over
Solodia tamona las.
Solodia tamona lasi.
 soldier one.only not

'Very many soldiers all over the place. Lots [lit. not only one].'

I: *Amerikan taudia?*
Amerika taudia?
 American persons

'Americans?'

N: *Inglis taudia momo herea.*
Infilis taudia momo herea.
 English persons many very

'Lots and lots of English ones.'

I: *Amerikan danu?*
Amerika danu?
 American also

'Americans too?'

N: *Amerika danu lau dav-- Amerika kini lau lau itaia,*
Amerika danu lau dav-- Amerika kini lau lao itaia,
 America also I America commander I go see

Amerika Gavana bada herea. Lau lau iena gabu a--
Amerika Gavana bada herea. Lau lao ia-ena gabu a--
 American Governor important very I go his place ah--
iena kempa dekena.
ia-ena kempa dekena.
 his camp to

'Americans too I saw-- I went to see the American commander, the big boss. I went to his camp.'

I: *Ia mahuta o ia gaukara?*
Ia mahuta o ia gaukara?
 he sleep or he work

'Does he sleep or work?'

N: *O, ia gaukara inei kini ia lau-- lau lau itaia*
O, ia gaukara inai kini ia lao-- lau lao itaia
 oh he work this commander he go-- I go see

wadain ia mai memero ibounai ai poren. Wadain ia kou,
vadaeni ia mai memero ibounai ai poren. Wadain ia gwau,
 okay he come boys all we (excl) parade okay he say

"*Omi edena taudia?*" "*Ai be Papua.*"

"*Umui edena taudia?*" "*Ai be Papua.*"

you (pl) which persons we (excl) FOCUS Papua

"*O:, madi lau bogahisi omi mai daudau herea.*"

"*O:, madi lau bogahisi umui mai daudau herea.*"
 oh dear I sad you (pl) come long.way very

"*To, badina iniseni idia bogahisi idia boiboi ai mai inei*

"*To, badina iniseni idia bogahisi idia boiria ai mai inai*
 yes reason here they sad they call.out we (excl) come this

gabau ai itaia." *Wada ia kou, "O, lasi, do:re*
gabau ai itaia." *Vada ia gwau, "O, lasi, dohore*
 place we (excl) see okay he say oh no later

lau omi abia lau lau hadibaia lauegu ipidi omi
lau umui abia lao lau hadibaia lauegu ipidi umui
 I you (pl) get go I show my gun you (pl)

itaia. Inei uda dekenai idia tuari sikulu idia karaia."
itaia. Inai uda dekenai idia tuari sikulu idia karaia."
 see this bush in they fight school they make
Wadain ia abia lau, Amerika tauna, inei kini, inei
Vadaeni ia abia lao, Amerika tauna, inai kini, inai
 okay he get go America man this commander this
kini ia abia lau wadain iena gaukara ibounai ia
kini ia abia lao vadaeni ia-ena gaukara ibounai ia
 commander he get go okay his work all he
hadibaia ai itaia wadaini ai giroa ai lou Bulispen.
hadibaia ai itaia vadaeni ai giroa ai lou Burisbeni.
 show us (excl) see okay we (excl) turn.around we return Brisbane

'Oh, he works, this commander. He-- I went to see him. He came and all the boys paraded. Then he said, "Where are you chaps from?" "We're Papuans." "Oh dear, I'm sorry, you're a very long way from home." "Yes, because they're sorry [for us] here they sent word for us to come and we came." Then he said, "Oh, no, I'll take you (pl) and show you my weapons and you'll see them." They have these training schools in the bush. So this American commander took us and showed us all the things they were doing. We saw them. We then returned to Brisbane.'

I: *Ipidi danu oi faia?*
Ipidi danu oi faia?
 gun also you fire

'Did you fire the guns too?'

N: *Pidi danu lau faia, blenigani lau faia, inei tomigani lau*
Ipidi danu lau faia, brenigani lau faia, inai tomigani lau
 gun also I fire Bren gun I fire this Tommy gun I
faia. Memero ibounai ai lau taudia ibounai ai
faia. Memero ibounai ai lao taudia ibounai ai
 fire boys all we (excl) to persons all we (excl)
faia ai traिम traिम.
faia ai traिम traिम.
 fire we (excl) try try

'I fired the guns too, Bren guns and Tommy guns. All of us that went tried firing them.'

I: *Amerikan taudia ia ura tuari Japan sedira?*
America taudia idia ura tuari Diapani sedira?
 America persons they want fight Japan perhaps

'I guess the Americans are itching to fight the Japanese?'

N: *O, Amerika ibounai idia dulua inei Inglis dekenai. Idia*
O, Amerika ibounai idia durua inai Inglisi dekenai. Idia
 oh America all they help this English to they

ula tuari. Idiena kini ia heleva inei bamona
ura tuari. Idia-edia kini ia hereva inai bamona
 want fight their commander he say this like

lau dekenai. Ia ko, "Do:re lau danu lau ula tuari.
lau dekenai. Ia gwau, "Dohore lau danu lau ura tuari.
 me to he say later I also I want fight

Diapan do:re lau pidia." Ia durua Inglis dekena.
Diapani dohore lau pidia." Ia durua Inglisi dekena.
 Japan later I shoot he help English to

'Oh, all the Americans want to help the English. They're itching to fight. Their commander said to me that he also wanted to fight the Japanese, to shoot them. He's helping the English.'

I: *Haida ia daikau guna inei Brisben dekena, haida ia gabiai?*
Haida idia daekau guna inai Burisbeni dekena, haida idia gabeai?
 some they go.up first this Brisbane to some they later

'Some have gone up to Brisbane first, some will be going later will they?'

N: *Haida be ia daikau guna, haida be gabia ia daikau,*
Haida be idia daekau guna, haida be gabeai idia daekau,
 some FOCUS they go.up first some FOCUS later they go.up

Bulispen dekena.
Burisbeni dekena.
 Brisbane to

'Some have gone up to Brisbane first, some will be going up later.'

I: *Brisben dekena ruma bada herea oi davaría?*
Burisbeni dekena ruma bada herea oi davaría?
 Brisbane at house big very you find

'Did you come across very big buildings in Brisbane?'

N: *O, luma malaki lasi, luma be momo herea, ba:da helea.*
O, ruma maraki lasi, ruma be momo herea, ba:da herea.
 oh house small not house FOCUS many very big very

'Oh, the buildings are not small. There's lots of very very big buildings.'

I: *Ataiái?*
Ataiái?
 high

'High?'

N: *Ataiái.*
Ataiái.
 high

'High.'

I: *Henunai?*
Henunai?
 underneath

'Underground?'

N: *Henunai, ia daikau inei-- idia stat inei, ia daikau*
Henunai, idia daekau inai-- idia stati inai, idia daikau
 underneath they go.up this they start there they go.up

daikau daikau ololo bamona.

daekau daekau ororo bamona.

go.up go.up mountain like

'Underground. They rise like this-- they start here and they rise up and up like mountains.'

I: *Oi gari las?*
Oi gari lasi?
 you fear not

'Weren't you frightened?'

N: *O, lau gari las. Lau daikau wadain iena heleva dekenai*
O, lau gari lasi. Lau daekau vadaeni ia-ena hereva dekenai
 oh I fear not I go.up okay his talk from

lau daikau daikau lau itaia wadain inei, Bulispen dekena

lau daekau daekau lau itaia vadaeni inai, Burisbeni dekenai

I go.up go.up I see okay this Brisbane at

inei luma badana.

inai ruma badana.

this house big.one

'Oh, I wasn't frightened. I went up as we were told to and I went up and up. I saw it, in Brisbane, this big building.'

I: *Momokan?*
Momokani?
 true

'Truly?'

N: *Lau-- momokani lau daikau wadain.*
Lau-- momokani lau daikau vadaeni.
 I-- true I go.up completed

'I-- it's true that I went up.'

I: *Mero haida ia moru las?*
Memero haida idia moru lasi?
 boys some they fall not

'Didn't some of the boys fall down?'

N: *Mero haida ia-- memero ibounai idia diba idia gwada*
Memero haida idia-- memero ibounai idia diba idia goada
 boys some they-- boys all they know they strong

karaia ai daikau. Ai moru las.
karaia ai daekau. Ai moru lasi.
 make we (excl) go.up we (excl) fall not

'Some boys-- all the boys were able to steel themselves and we went up and didn't fall down.'

TRACK NO.7

I: *Brisben dekena oi laka edeseni omui lau?*
Burisbeni dekena oi raka edeseni umui lao?
 Brisbane at you walk where you (pl) go

'In Brisbane where did you (pl) go?'

N: *Ai he ...tale dekena...*
Ai he ...dala dekena...
 we (excl) ...road on

'We...'

I: *...dala dekena?*
...dala dekena?
 ...road on

'...on the way?'

N: *...tala dekenai he -- ai heau tlen dala dekena*
...dala dekenai he -- ai heau treni dala dekena
 ...road on -- we (excl) run train road on

ai lau inei gabu namona ai heau heau
ai lao inai gabu namona ai heau heau
 we (excl) go this place good.one we (excl) run run

wadain, inei ololo bada helea, ia gageva gageva,
vadaeni, inai ororo bada herea, ia gageva gageva,
 okay this mountain big very it crooked crooked

wadaini lalonai ai wariei.
vadaeni lalonai ai vareai.
 okay inside we (excl) enter

'...we went on the train along the railway line. We went to this nice place. We were travelling along and we went through this big winding mountain.'

I: *Oi lau uda dekenai?*
Oi lao uda dekenai?
 You go bush in

'Did you go into the bush?'

- N: *Io, uda dekena. Uda dekena ai lau inei tlen*
Io, uda dekena. Uda dekena ai lao inai treni
 yes bush in bush in we (excl) go this train
- dekenai. Ai lau lau: lau: inei tlen dekena uda*
dekenai. Ai lao lao: lao: inai treni dekena uda
 in we (excl) go go: go: this train in bush
- dekena inei ololo ia gageva gageva.*
dekena inai ororo ia gageva gageva.
 in this mountain it crooked crooked

'Yes, into the bush. We went by train into the bush. We went a very long way into the bush and there was this very winding mountain.'

- I: *Ororo ia daikau?*
Ororo ia daekau?
 mountain it go.up

'Did it [the train] go up the mountain?'

- N: *Ororo ia daikau. Wadaini ololo dekena ia daikau wadain*
Ororo ia daekau. Vadaeni ororo dekena ia daekau vadaeni
 mountain it go.up okay mountain on it go.up okay
- ia diho matuna dekena ia wariei. A-- ololo be atai ai*
ia diho matuna dekena ia vareai. A-- ororo be atai ai
 it go.down hole in it enter ah-- mountain FOCUS high
- ia gini wadain matuna ai heau. Matuna dekena.*
ia gini vadaeni matuna ai heau. Matuna dekena.
 it stand okay hole we (excl) run hole in

'It went up the mountain. It went up and then it went down into the tunnel. Ah-- the mountain was above and we went into the tunnel.'

- I: *Hanuaboi mo?*
Hanuaboi mo?
 night only

'Was it really dark [lit. only night]?'

- N: *Hanuaboi momokani, taunimanima itaia las. A, dibura momokan.*
Hanuaboi momokani, taunimanima itaia lasi. A, dibura momokani.
 night true people see not oh dark true

'It was just like night-time. You couldn't see anyone. Oh, it was really dark.'

- I: *Oi gari las?*
Oi gari lasi?
 you fear not

'Weren't you afraid?'

N: *Lau gari lasi, lau be tleni lalonai dekenai lau helai*
Lau gari lasi, lau be treni lalonai dekenai lau helai
 I fear not I FOCUS train inside at I sit

no.: Wadain heau heau wadaini lau diho inei, keru
noho. Vadaeni heau heau vadaeni lau diho inai, keru
 stay okay run run okay I go.down this cold

gabuna dekena lau davaria.
gabuna dekena lau davaria.
 place to I find

'I wasn't afraid. I was inside the train and I stayed sitting there. We kept travelling and I went down and came upon this cold place.'

I: *Ororo hanaia?*
Ororo hanaia?
 mountain cross.over

'Did you cross the mountain?'

N: *Ororo hanaia, wadain inei keru gabuna lau davaria.*
Ororo hanaia, vadaeni inai keru gabuna lau davaria.
 mountain cross.over okay this cold place I find

'Crossed the mountain. Then I came upon this cold place.'

I: *Uda anina las?*
Uda anina lasi?
 bush contents not

'Was the bush empty?'

N: *O, uda be taunimanima momo herea. Tau kulokulo kavakava*
O, uda be taunimanima momo herea. Tau kurokuro kavakava
 oh bush FOCUS people many very man white all.over

bona solodia kavakava a-- ipidi idia atoa misingani
bona solodia kavakava a-- ipidi idia atoa mininigani
 and soldier all.over ah-- gun they put machine-gun

idia naria insini.
idia naria iniseni.
 they look.after here.

'Oh, there are lots and lots of people in the bush. Europeans all over the place and soldiers all over the place ah-- they have erected guns and machine-guns protect the place.'

I: *Hanua?*
Hanua?
 village

'What about towns?'

- N: *Hanua momo herea ia lau lau lau, dokona edeseni ia lau*
Hanua momo herea idia lao lao lao, dokona edeseni idia lao
 village many very they go go go end where they go
- inei gabu ibounai. Tau kurokuro be momo herea. Inei*
inai gabu ibounai. Tau kurokuro be momo herea. Inai
 this place all man white FOCUS many very this
- dala be ia noho kava lasi. Hanua kavakava ia lau.*
dala be ia noho kava lasi. Hanua kavakava idia lao.
 road FOCUS it stay in.vain not village all.over they go
- Teleni ia heau negana wadain ia hitolo las. Idia diho*
Treni ia heau negana vadanei ia hitolo lasi. Idia diho
 train it run time okay it hungry not they go.down
- wadain inei luma badadia dekena aniani abia ania heau,*
vadaeni inai ruma badadia dekena aniani abia ania heau,
 okay this house big.ones in food get eat run
- inei bamona.*
inai bamona.
 this like

'There are lots and lots of towns and they stretch to who knows where. There are just so many Europeans. And this railway line isn't just idly sitting there. There are towns all along it. When the train runs it's never without fuel [lit. not hungry]. They go down into this big shed and get refuelled and then run on. It's like that.'

- I: *Dina oi stat hanuaboi oi davaría?*
Dina oi stati hanuaboi oi davaría?
 day you start night you find

'You started in the day and got there at night did you?'

- N: *Dina lau stati lau lau hanuaboi lau davaría.*
Dina lau stati lau lao hanuaboi lau davaría.
 day I start I go night I find

'I started in the day and got there at night.'

- I: *Edeseni mahuta?*
Edeseni manuta?
 where sleep

'Where did you sleep?'

- N: *Lau mahuta inei gabu ta dekenai lau diho, keru gabuna dekena.*
Lau mahuta inai gabu ta dekenai lau diho, keru gabuna dekena.
 I sleep this place one at I go.down cold place at

'I slept in the place where I went down to, where it was cold.'

I: *la keru?*
la keru?
 it cold

'Was it cold?'

N: *la keru momokani, aisi bamona ia diho. Wadaini mahuta*
la keru momokani, aisi bamona ia diho. Vadaeni mahuta
 it cold true ice like it come.down okay sleep
daba rere wadaini motuka ia lau abia. Lau lau gunika
daba rere vadaeni motuka ia lao abia. Lau lao gunika
 morning break okay car it go get I go inland
momokani. Inei tau kurokuro idiena uda dekenai inei uda
momokani. Inai tau kurokuro idia-edia uda dekenai inai uda
 true this man white their bush in this bush
be solodia kavakava. Lau lau tanika gabuna dekena.
be solodia kavakava. Lau lao tanika gabuna dekena.
 FOCUS soldier all.over I go tank place to

'It was extremely cold. Something like ice settled [down during the night]. So we slept and at daybreak a car came and picked us up. I went into the real inland. In this bush belonging to the Europeans there are soldiers everywhere. I went to a place where there were tanks.'

I: *Tuari taudia?*
Tuari taudia?
 fight persons

'Fighters?'

N: *Tuari taudia. Inei, tau kurokuro. Idia lau inei hanua*
Tuari taudia. Inai, tau kurokuro. Idia lao inai hanua
 fight persons this man white they go this village
makoia bamona ibounai momo herea inei gunika ia honu
makohia bamona ibounai momo herea inai gunika ia honu
 break like all many very this inland it full.up
masemase. Tanika momo, tanika be ipidi inei, misinigani
masemase. Tanika momo, tanika be ipidi inai, misinigani
 really tank many tank FOCUS gun this machine-gun
danu idia abia lau atoa, kahana kahana.
danu idia abia lao atoa, kahana kahana.
 also they get go put side side

'Fighters, these Europeans. They go to this area in the bush which is filled with kind of broken down villages. There are lots of tanks - a tank is a kind of a gun - and have set up machine-guns on this side and that.'

I: *la tuari taudia o skul taudia?*
Idia tuari taudia o sikulu taudia?
 they fight persons or school persons

'Are they infantrymen or instructors?'

N: *la sikulu taudia inei tuari dekena ia sikulu taudia.*
Idia sikulu taudia inai tuari dekena idia sikulu taudia.
 they shcool persons this fight at they school persons

'They're instructors who train others for war.'

I: *la diba?*
Idia diba?
 they know

'Do they know?'

N: *la diba, idia hadibaia. Haida be idia diba wadain*
Idia diba, idia hadibaia. Haida be idia diba vadaeni
 they know they teach some FOCUS they know okay

matamata idia hadibaia be idia diba wadain.
matamata idia hadibaia be idia diba vadaeni.
 new.ones they teach FOCUS they know completed

'They know. They instruct. Some who know teach new recruits. They know all right.'

I: *Momokani?*
Momokani?
 true
 'Truly?'

TRACK NO.8

I: *Tanika gabuna ita lawalooa djenerol tauna ta oi davarua?*
Tanika gabuna ita loalooa djenerol tauna ta oi davarua?
 tank place we (incl) walk.about general person one you find

'When we were walking about the place where the tanks were did you meet a general there?'

N: *Lau davarua wadain.*
Lau davarua vadaeni.
 I find completed

'I met him.'

I: *Da:ka ia hereva?*
Dahaka ia hereva?
 what he say

'What did he say?'

N: *la kou, "Kailakaila lau daikau inei tanika dekena."*
la gwau, "Kahirakahira lau daekau inai tanika dekena."
 he say soon I go.up this tank into

'He said that he was about to board this tank.'

I: *Edeseni ia daikau?*
Eseseni ia daekau?
 where he go.up

'Where was he going to board?'

N: "*Lau sieia do:re ia lau Hanuabada.*"
 "*Lau siaia dohore ia lao Hanuabada.*"
 I send later it go Hanuabada

[He said,] "I'm going to send it/them to Hanuabada."

I: *Momokan?*
Momokani?
 true

'Truly?'

N: *Io.*
Io.
 yes

'Yes.'

I: *Memero danu ia gaukara tanka?*
Memero danu idia gaukara tanika?
 boys also they work tank

'Did the boys also [try] working the tank?'

N: *Io, wadain ia kou, "Do:re hari lau omi traim. Dohore*
Io, vadaeni ia gwau, "Dohore hari lau umui traim. Dohore
 yes okay he say later now I you (pl) try later
lau sieia negana, wadaini Hanuabada dekena do:re memero
lau siaia negana, vadaeni Hanuabada dekena dohore memero
 I send time okay Hanuabada to later boys
se ia hadibaia. Edia gabu idia hadibaia."
ese ia hadibaia. Edia gabu idia hadibaia."
 SUBJECT.MARKER it show their place they show

'Yes, and he said, "Now I'll try you out. When I send it/them to Hanuabada the boys will show it. They will show their place.'

I: *Momokan?*
Momokani?
 true

'Truly?'

N: *Momokani.*
Momokani.
 true

'Yes.'

I: *Nau, inei gabuna ia lakatania:: edeseni ita dio?*
Nau, inai gabuna idia rakatania:: edeseni ita diho?
 now this place they leave where we (incl) go.down

'Now, where did we go down to after they left this place?'

N: *Inei tanika gabuna?*
Inai tanika gabuna?
 this tank place

'[You mean] this tank place?'

I: *Io.*
Io.
 yes
 'Yes.'

N: *Tanika gabuna lakatania wadain ita diho Niukasolo dekenai.*
Tanika gabuna rakatania vadaeni ita diho Niukasolo dekenai.
 tank place leave okay we (incl) go.down Newcastle to

'After we left the tank place we went down to Newcastle.'

I: *Momokan?*
Momokani?
 true

'Is that so?'

N: *Oibe.*
Oibe.
 yes
 'Yes.'

I: *Da:ka oi davarua?*
Dahaka oi davarua?
 what you find

'What did you discover?'

N: *O, insini be auri idia karaia.*
O, iniseni be auri idia karaia.
 oh here FOCUS iron they make

'Oh, they make iron there.'

I: *A! Oi hadibaia.*
A! Oi hadibaia.
 really you teach

'Is that so. Tell us about it.'

N: *Tanu idia nadua bona nadi idia nadua. Wadaini auri ibounai*
Tano idia nadua bona nadi idia nadua. Vadaeni auri ibounai
 earth they cook and stone they cook okay iron all

idia karaia inisini, masini dekenai. Guna be idia nadua,
idia karaia iniseni, masini dekenai. Guna be idia nadua,
 they make here machine in first FOCUS they cook

wadaini lahi be bada herea.
vadaeni lahi be bada herea.
 okay fire FOCUS big very

'They cook up earth and stones. Then they make all the iron there, in a machine. They cook it first. The fire is very big.'

I: *A!*
A!
 really

'Is that so.'

N: *Lahi be ia hululu wadain ia diho negana be abata*
Lahi be ia hululu vadaeni ia diho negana be abata
 fire FOCUS it flare.up okay it go.down time FOCUS flood

bamona ia moru diho inei tanika badana dekenai. Wa
bamona ia moru diho inai tanika badana dekenai. Vada
 like it fall go.down this tank big in okay

insini ia seia idia lau bubua wadain inei misini dekenai.
iniseni ia seia idia lao bubua vadaeni inai masini dekenai.
 here it pour they go tip.out okay this machine in

'The fire flares up then when the iron goes down it's like a flood. It falls down into this big tank. There they pour it out into this machine.'

I: *Oi gari las?*
Oi gari lasi?
 you fear not

'Weren't you afraid?'

N: *Be lau gari las. Lau daikau lau itaia. Ia sياهو momo*
Be lau gari lasi. Lau daekau lau itaia. Ia sياهو momo
 FOCUS I fear not I go.up I see it hot plenty

wadain lau lau lau itaia laegu matana momokani dekena.
vadaeni lau lao lau itaia laegu matana momokani dekena.
 okay I go I see my eye true with

'Of course [lit. FOCUS] I wasn't frightened. I went up and watched. It was extremely hot but I went and watched with my own eyes.'

I: *Gaukara bada herea?*
Gaukara bada herea?
 work big very

'Is it very big work?'

N: *Gaukwreia malaki las.*
Gaukara maraki lasi.
 work small not

'Very big work [lit. no small work].'

I: *Taunimanima hida ia gaukara?*
Taunimanima hida idia gaukara?
 people how.many they work

'How many people were working [there]?'

N: *O, et thausen idia gaukwreia insini.*
O, et tauseni idia gaukara iniseni.
 oh eight thousand they work here

'Oh, eight thousand were working there.'

I: *A' Auri ia karaia wadain, edena bamona ia karaia lou?*
A' Auri idia karaia vadaeni, edena bamona idia karaia lou?
 really iron they make completed what like they make again

'Having made the iron how do they process it?'

N: *Auri ia karaia, wadaini misini dekenai wadain auri*
Auri idia karaia, vadaeni masini dekenai vadaeni auri
 iron they make okay machine in/with okay iron
ibounai wadain inei Niukasolo dekena idia sieia, gabu ibounai.
ibounai vadaeni inai Niukasolo dekena idia siaia, gabu ibounai.
 all okay this Newcastle from they send place all

'All the iron is made in a machine at Newcastle and then it is sent from there all over the place.'

I: *A'*
A'
 really

'Is that so?'

N: *Ikoko idia karaia. Waia danu idia karaia. Babuwaia danu*
Ikoko idia karaia. Waia danu idia karaia. Babuwaia danu
 nail they make wire also they make barbed.wire also

idia karaia, inei Niukasolo dekena.
idia karaia, inai Niukasolo dekena.
 they make this Newcastle at

'They make nails and wire, barbed wire as well, at Newcastle.'

I: *Sedila faktri haida oi davarua las?*
Sedira faketeri haida oi davarua lasi?
 perhaps factory some you find not

'I guess you didn't get to see some factories?'

- N: *O faketeli be momo herea. Bema lau noho lagani tamona*
O faketeri be momo herea. Bema lau noho lagani tamona
 oh factory FOCUS many very if I stay year one.only
- negana gabu ibounai lau itaia ore. To inei be lau*
negana gabu ibounai lau itaia ore. To inai be lau
 time place all I see finish but this FOCUS I
- gabu ibounai lau itaia loaloa dekena wadain lau no: insini*
gabu ibounai lau itaia loaloa dekena vadaeni lau noho iniseni
 place all I see walk.about at okay I stay here
- dina toi bamona.*
dina toi bamona.
 day three like

'Oh, there are lots and lots of factories. If I could have stayed for only one year I would have seen them all. But I only stayed something like three days and I walked about and saw all the places.'

- I: *Gunaguna Papua taudia da:ka ia lalao auri dekena?*
Gunaguna Papua taudia dahaka idia lalao auri dekena?
 formerly Papua persons what they think iron about

'What did Papuans used to think about iron?'

- N: *Sedila o-- ia lalao inei bamona, inei-- sedila inei auri*
Sedira o-- idia lalao inai bamona, inai-- sedira inai auri
 perhaps oh-- they think this like this-- perhaps this iron
- ibounai be mas taudia idia karaia.*
ibounai be mase taudia idia karaia.
 all FOCUS dead persons they make

'Probably-- they thought like this-- I think they thought the ancestors made it.'

- I: *Mase taudia?*
Mase taudia?
 dead persons

'The ancestors?'

- N: *Oibe.*
Oiba.
 yes

'Yes.'

- I: *Momokan?*
Momokani?
 true

'Really?'

N: *Momokan.*
Momokani.
 true
 'Yes.'

I: *Na hari?*
Na hari?
 and now
 'And now?'

N: *Hari be lau mai lauegu matana dekena lau itaia be*
Hari be lau mai lauegu matana dekena lau itaia be
 now FOCUS I come my eye with I see FOCUS
tau kurokuro sibona au-- auri idia karaia. Anina momokani
tau kurokuro sibona au-- auri idia karaia. Anina momokani
 man white self -- iron they make contents true
lau itaia wadain.
lau itaia vadaeni.
 I see completed

'Now I've seen with my own eyes that it is made by Europeans themselves. I've seen the reality [lit. true contents].'

I: *Io, momokani oi hereva. Sene taudia, tau kurokuro sene*
Io, momokani oi hereva. Sene taudia, tau kurokuro sene
 yes true you talk ancestor persons man white ancestor
taudia guna ia traim traim, ia diba sisina, harihari
taudia guna idia traim traim, idia diba sisina, harihari
 persons before they try try they know a.little nowadays
taudia ia diba maraki las.
taudia idia diba maraki lasi.
 persons they know little not

'Yes, that's true. Before the Europeans' ancestors tried and tried to make it but they only knew a little bit. The modern generation knows a lot.'

N: *Io, hari taudia be idia karaia momokani idia diba ore*
Io, hari taudai be idia karaia momokani idia diba ore
 yes now persons FOCUS they make true they know finish
gau ibounai.
gau ibouna.
 thing all

'Yes, the modern generation does things properly. They know about everything.'

I: *Io, tuari gauna, ibona, ibona ia karaia, auri dekena.*
Io, tuari gauna, ibounai, ibounai idia karaia, auri dekena.
 yes fight thing all all they make iron out.of

'Yes, war equipment and you name it is made out of iron.'

N: *Ibounai idia diba maraki las. Hahine danu ia gaukwreia*
Ibounai idia diba maraki lasi. Hahine danu idia gaukaraia
 all they know little not woman also they produce
tau danu ia gaukwreia.
tau danu idia gaukaraia.
 man also they produce

'They all know a great deal. Women as well as men produce.'

NOTES

1. For further details about the recordings see Dutton (1986:351, 354, 366-369).
2. As noted in Dutton 1986: 382 (fn.21) the party was under the official care of Warrant Officer 'Bill' Gordon of ANGAU. Mr Gordon is still living and in 1985 I tried unsuccessfully to get him to discuss Nanai's recordings with me to clarify some of the details in it and to comment on his own and Nanai's backgrounds and involvement in the episode. However, Mr Gordon feels himself still bound to silence by an oath taken at the time and will therefore not consider being interviewed even under the strictest conditions. As far as is known none of the other Europeans connected with this incident is still living.

Some of the questions I wished to put to Mr Gordon were the following:

- a) When did you first meet Nanai? What do you know about his background? What languages could he speak when he visited Australia e.g., Police Motu, 'Broken English', proper English, New Guinea Pidgin English?
- b) Why was he selected to go to Australia?
- c) Why was he selected to make the recording?
- d) Were there other recordings made?
- e) Where was the recording made?
- f) Who was the interviewer on the recording?
- g) Would you say Nanai's Police Motu was typical of Police Motu outside of Port Moresby at the time?
- h) What places did the group visit and in what sequence? Did they visit Toowoomba and Narrabri? Where did they go to see farmers producing food for the army?/war effort?
- i) Which sections were travelled by train and which by plane?
- j) Where did they go through tunnels in the train?
- k) Where was Merraberai mentioned by Nanai?
- l) Where did the group go for flights in aeroplanes?
- m) Have you got any copies of the photos taken of the group in Australia? If so could I have a copy made of them?/of selected ones?
- n) How long were they in Australia?
- o) What happen to them when they got back? Where did Nanai go? Did he go into the PIB?

- p) How did the members of the group communicate? If the sergeant in the group was from Manus Island how did he communicate with the rest? Could and did any others speak New Guinea Pidgin to him?
- q) Who accompanied the group? Did G.A.V. Stanley?
- r) What sections did you accompany them on?
- s) Why were you chosen?
- t) Where did you learn Police Motu?
- u) Do you speak any other Papua New Guinea languages? Which? Motu?
- v) Did you spend much time outside of Port Moresby? If so where and what did you notice about Police Motu there?
- w) Do you know who the instructors in the Police Motu classes run by the Army for Army personnel in Port Moresby during the war were?
- x) Would you mind talking to me in Police Motu?
- y) Do you know where Bauba Maba, one of the group, was from - district, sub-district, village?
3. Note that *gaukreia* and *gaukwreia* in Nanai's speech seem to correspond to both *gaukara* 'to work' and *gaukaraia* 'to work something, to produce, to manufacture' in other varieties of Police Motu.

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THE LANGUAGES OF THE NORTH HALMAHERAN STOCK

C.L. VOORHOEVE

1. INTRODUCTION

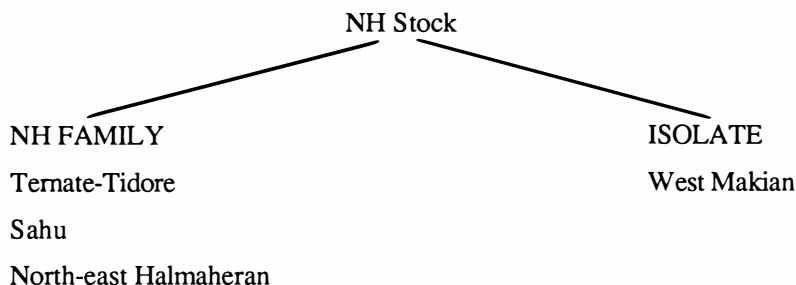
This paper is intended as a preliminary to a comparative study of the languages of the North Halmaheran Stock, which will appear as 'The languages of the North Halmaheran Stock II'. It is based on a short survey paper entitled 'The non-Austronesian languages of the North Moluccas' which I wrote for the Seminar Halmahera dan Raja Ampat held in Jakarta in June 1981. It was scheduled to appear in the proceedings of the Seminar, but adverse circumstances have so far delayed the publication. In the meantime work by myself and others¹ has contributed significantly to our knowledge of the North Halmaheran languages so that the Seminar paper, when it finally sees the light, will be dated to such a degree that preparing an updated and expanded version seems fully warranted. In contrast to the earlier paper however I shall include only a select bibliography. In 1981 an annotated bibliography of the North Moluccas appeared which contains amongst others all the known publications dealing in one way or another with the languages in that area (Polman 1981). They span the period from 1862 to 1980. In the present paper I shall therefore restrict myself to giving full bibliographical references only for the most important works of that period and for more recent publications (a few publications which appeared in 1980 fall also in this category). Whenever in this paper reference is made to a work listed in the annotated bibliography, its list number in that work will be added after the publication date. If it is also included in the bibliography at the end, the name of the author will be starred. Thus, '*Veen 1915 [56]' indicates that the full bibliographical reference is given in this paper and that it can also be found under number 56 of the annotated bibliography.

2. THE NORTH HALMAHERAN STOCK

On the northern half of the North Moluccan island of Halmahera and on the offshore islands to the north and west a group of four related languages is spoken which form a non-Austronesian enclave in Austronesian language territory. They are: West Makian, Ternate-Tidore, Sahu, and North-east Halmaheran, collectively known as the North Halmaheran (NH) languages. The group has its closest linguistic ties with the languages in the western tip of the Bird's Head Peninsula, Irian Jaya, and is distantly related to most of the other languages in the Bird's Head. The superordinate group to which all these languages belong is the West Papuan Phylum².

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On the basis of percentages of shared cognates in a 100-item basic wordlist the NH languages can be classified as a stock divided into one Family and one Family-level Isolate:



The criteria adopted for the classification are: 100% - 81% for dialects of the same language; 80% - 28% for different languages belonging to the same family; 27% - 13% for languages belonging to different families but the same stock; 6% - 12% for languages belonging to different stocks of the same phylum. A further division into groups of dialects, subfamilies, etc. is possible if within a range clustering of cognation percentages is found to occur.

The classification presented above is not without problems. I shall deal with these in the course of the discussion of the individual languages.

Occasionally I shall mention diagnostic sound correspondences to highlight the differences between lexically very similar dialects or subdialects. A full account of the often very complex patterns of sound correspondences between the NH languages and even between dialects of the same language, will be given in the sequel to this paper.

Earlier Dutch surveys of the languages of the NH Family are Hueting 1908 [44]³ and *Veen 1915 [56]. They distinguish nine languages or dialects (the terms are used interchangeable): Ternate, Tidore, Sahu, Tobaru, Loloda, Galela, Tobelo, Modole, and Pagu. The latter six are now classified as dialects of North-east Halmaheran. Hueting's survey contains short comparative wordlists; Van der Veen focusses on those grammatical points which characterise the NH languages as non-Austronesian.

In the following survey of the NH languages I shall describe their location only in general terms, and mention village names only when something has to be said about particular villages. For full details the reader should consult the maps and village lists at the end of the paper.

2.1 WEST MAKIAN

West Makian is spoken on the western side of Makian Island, in a few villages on the west coast of the southern peninsula of Halmahera, and in a number of villages on the islands of Moari, Lelei, Gunage, and Gafi.⁴ An estimated 12,000 people speak West Makian as their first language. Of these about 7,000 live on Makian Island.

West Makian shares 28% cognates with Ternate-Tidore and Sahu, and 21% - 25% cognates with the dialects of North-east Halmaheran. The cognation percentage with Ternate-Tidore and Sahu would be just enough to classify West Makian as a subfamily isolate within the NH Family. Both West Makian and Sahu however have been strongly influenced by the Ternate dialect of Ternate-

Tidore so that the figure of 28% is probably somewhat inflated by undetected borrowings. The present classification takes this into account. There are seven West Makian speaking villages on Makian Island. Judging by the existing wordlists (Teljeur 1982) each village speaks its own variant of the language, characterised by minor lexical differences with other variants. It is not known whether separate dialects of West Makian are spoken in West Makianese settlements outside the island.

The most recent publication on West Makian is Voorhoeve, ed. 1982 which contains a general introduction to the language, a grammatical sketch, a wordlist and text by Voorhoeve, a supplementary wordlist and grammatical notes by Collins, and short comparative wordlists by Teljeur.

2.2 TERNATE-TIDORE

This language is spoken in two main dialects, Ternate and Tidore. In earlier publications (Huetting 1908 [44], *Veen 1915 [56], Masinambow 1972 [69]) the two have been treated as separate languages. My own data show that they are very closely related, sharing 80% cognates in the basic wordlist. This figure would put them at the top of the percentage range for languages of one family, but according to my informants the two are mutually intelligible so that I prefer to classify them as dialects of the same language.

2.2.1 TERNATE

The Ternate dialect is spoken on the islands of Ternate and Hiri, on Talimau and on the southern tip of Moari (the latter two islands are in the Kayoa group), in a number of villages on the west coast of North Halmahera and by Ternatese settlers on Obi and Bacan. Masinambow (1972) citing the 1930 census gives the figure of 10,000 for Ternatans living on Ternate Island and 32,000 for Ternatans living elsewhere. According to the 1976 census there were at that time 20,000 Ternatans living on Ternate Island outside the town of Ternate which itself had a largely immigrant population of 42,000. This would mean that within half a century the native population on Ternate had more than doubled. The present number of Ternate speakers on the island can be expected to exceed 30,000. How many of the tens of thousands expatriate Ternatans still speak their native language is not known. I have not been able to obtain from my informants any information on subdialectal variation on Ternate Island. However, that no local variants would exist is unlikely and this is a matter for further investigation.

In earlier times the Ternate dialect was widely used as a lingua franca in the regions under the political dominance of the Sultan of Ternate. The most explicit statement on its role as a vehicle of interethnic communication I have been able to find is from De Clercq, resident of Ternate from 1885 to 1888 and author of the important *Bijdragen tot de kennis der Residentie Ternate* (Contributions to the knowledge of the Residency of Ternate), who had this to say (translation mine):

The Ternate language is, so to say, the lingua franca of the Moluccan Archipelago in a narrower sense because the native tongue of the original Ternatans is understood by almost all the subjects of the Sultan who live in the coastal settlements of his vast territory. It is commonly used by traders in their dealings with the [local] populations, and Alfoors⁵ who have been converted to Islam often prefer it to their own native language. (*Clercq 1890 [120]:191)

In the 16th century the sultans of Ternate claimed a territory reaching from Halmahera in the east to the eastern and southern shores of Sulawesi in the west, and from Mindanao in the north to the Lesser Sunda Islands (Sumbawa, Flores) in the south (Clercq 1890:153). The 'Moluccan Archipelago in a narrower sense' referred to by De Clercq probably is the area which was still under the jurisdiction of Ternate at the end of the nineteenth century: the west coast of North Halmahera and nearby islands; the Bacan, Sula, and Banggai Archipelagoes, and on the east coast of Sulawesi the Batanta and Mandoni Districts and the kingdom of Tombuku. Now, a hundred years later, the Sultanate of Ternate belongs to the past and Bahasa Indonesia, the national language, asserts itself vigorously as the medium of inter-ethnic communication. It is to be expected therefore that the role of Ternate as a lingua franca is now greatly diminished. Unfortunately no one has so far made a study of this use of the Ternate dialect.

Apart from a few grammatical notes by De Clercq (1890:197-202) and Van der Veen (*Veen 1915 [56], *passim*) no grammatical description of Ternate has been published. Wordlists can be found in Van der Crab 1862 [386], Robidé van der Aa 1872 [29], Bastian 1894 [33], *Clercq 1890 [120], Huetting 1908 [44], *Fortgens 1917 [61], and Teljeur 1982. The most extensive and useful of these are the wordlists of De Clercq and Fortgens. The latter gives Dutch and Malay equivalents of the Ternate words; only Teljeur's list has English equivalents.

Ternate texts with Dutch translation have been published by Riedel 1871 [72], Van der Crab 1878 [74], Van Campen 1885 (a few *pantun*), Van Baarda 1923 [95], and *Fortgens 1930 [97]. The text published by Van der Crab also has a Malay translation. This text shows influences from the Tidore dialect.

A grammatical sketch accompanied by texts and an extensive wordlist, by Voorhoeve and Watuseke, is presently in preparation.

2.2.2 TIDORE

Tidore is spoken on the islands of Tidore, Maitara, and Mare; on the northern half of Moti, and on the mainland of Halmahera in the coastal areas round Oba, Payahi, and Lifofa. Tidorese settlers are also found in the Obi and Bacan Islands and along the south coast of Halmahera. According to the 1930 census 15,000 Tidorese were living on Tidore Island and 11,000 elsewhere (Masinambow 1972 [69]). If the population growth on Tidore Island has matched that on Ternate (see 2.2.1) the number of Tidore speakers on the island should now exceed 30,000. Again, it is now known how many expatriates still speak the Tidore dialect.

Although the power of the Sultanate of Tidore extended nominally over the south coast of Halmahera, the Raja Ampat Islands, and the south coast of West New Guinea as far as Etna Bay, no mention has come to my attention of its use as a lingua franca in this area. If it was ever used as such the changed political circumstances will probably have obliterated any traces of it.

On Tidore Island, as in West Makian, there are many local variants of the dialect. According to my informants every Tidorese village speaks its own brand of Tidore and it is possible to identify a speaker's home village by the peculiarities of his/her speech. Still, some villages at least share some linguistic peculiarities which makes it possible to distinguish two subdialects. My Mareku informant was quite explicit about the fact that in the villages Mareku, Oma, and Afa-afa the same subdialect is spoken and that it differs from the subdialect spoken in Soasio and the Kalodi villages in the following respects:

1. Mareku uses *da* 'here' where the Soasio variant has *re*. (According to a Kalodi informant however *da* is also used in the Soasio subdialect but only in polite speech whereas the people of Mareku use it in all speech situations).

2. Soasio words sometimes begin with *y* when the corresponding Mareku form has an initial vowel: *yeno* - *eno* 'rubbish, waste'; *yega* - *ega* 'snake'.

Further inspection of variant forms proffered by the informants brought two more systematic differences to light:

3. Word-final mid vowels in Mareku correspond regularly to high vowels in Soasio: *tage* - *tagi* 'to go'; *gase* - *gasi* 'salt', *kato* - *katu* 'thatch'.

4. Reduplications of CVCV words have often lost the first syllable in Mareku: *galegale* - *legale* 'intestines'; *belabela* - *labela* 'lightning'.

Further research is needed to establish whether the two subdialects extend beyond the villages mentioned above, and whether still other subdialects can be identified.

The only published data in Tidore are word lists: Van der Crab 1862 [386], Wallace 1869 [9], Robidé van der Aa 1872 [29], *Clercq 1890 [120] (a list of corrections of errors in the list of Robidé van der Aa), Hueting 1908 [44], Stokhof, ed. 1980 (contains two lists, one dating from 1904, the other from about 1933), and Teljeur 1982. A short grammatical sketch, texts, and a wordlist by Voorhoeve are presently in preparation.

2.3 SAHU

Sahu is spoken in the south-western corner of the northern peninsula of Halmahera in the valley of the Akelamo River and along the west coast from Jailolo Mountain to the mouth of the Ibu River. There are four dialects, Tala'i, Pa'disua⁶, Waioli, and Gamkonora. A fifth dialect, Ibu, was formerly spoken near the mouth of the Ibu River but now only a few very old people living in the villages Gamlamo and Gamici still know it to some extent. There are no exact data on the number of Sahu speakers. A rough estimate based on the number and size of the Sahu-speaking villages is 12,000, of which 4,000 speak Tala'i, 3,500 Pa'disua, 3,000 Waioli, and 1,500 Gamkonora.

Sahu (Pa'disua dialect) shares 77% cognates with Ternate and 66% cognates with Tidore. The cognation percentages with the dialects of North-east Halmaheran range from 65% to 81%. The latter value presents a problem to which I shall return in section 6.1.

Tala'i and Pa'disua share 99% cognates; their cognation percentage with Waioli is 98% and with Gamkonora and Ibu about 90%. The cognation density between Waioli, Gamkonora, and Ibu is also about 90%.⁷ These percentages group Tala'i, Pa'disua, and Waioli together against the other dialects. The subdivision can be further refined if we take phonological features into account. Tala'i and Pa'disua group together because they share a feature which is unique among the NH languages: the presence of a series of voiced implosive stops /'b, 'd, 'j, 'g/. These regularly correspond to voiced (explosive) stops in the other dialects with the exception of Ibu // which corresponds to Tala'i/Pa'disua /'d/. Other diagnostic sound correspondences are: Tala'i /p, c, k/ : Pa'disua /b, j, g/ respectively; and Tala'i/Pa'disua/Waioli /r/ : Gamkonora/Ibu // ; Tala'i/Pa'disua/Waioli/Gamkonora /' / : Ibu /w/ or Ø.

For Sahu we now have a dictionary and grammar which also gives more details for the dialects (Visser and Voorhoeve 1987). The older sources - Van der Crab 1862 [386], Bastian 1894 [33], Fortgens 1905 [41], 1912 [51], 1928 [64], *Veen 1915 [56] - contain only lexical data and a few comparative notes. They are more fully discussed in Visser and Voorhoeve.

2.4 NORTH-EAST HALMAHERAN

There are six dialects of North-east Halmaheran: Galela (Ga), Loloda (Lo), Tobelo (To), Modole (Mo), Tobaru (Tb), and Pagu (Pa). They group together in the following way: (Ga, Lo), (To, Tb, Mo), (Pa), as their cognation percentages show:

Lo	91				
To	83	86			
Tb	83	84	90		
Mo	82	83	91	91	
Pa	77	81	85	87	89
	Ga	Lo	To	Tb	Mo

Within the northern peninsula Ga and Lo form the northern group, To, Tb, and Mo the central group, and Pa the southern dialect. They clearly form a dialect chain with the members at the ends sharing a cognation percentage which falls below the dialect level. It is noteworthy that Loloda consistently shares somewhat higher cognation percentages with the dialects of the central group and Pagu than Galela although it is geographically further removed from them. This could be an accidental by-product of the choice of items in the basic word list, but it could also reflect a historical situation in which Loloda was in closer contact with the southern dialects than it is now.

2.4.1 GALELA

Galela is spoken in the southern half of Morotai Island and along the east coast from the tip of the peninsula to the southern shore of Galela Bay. Outside this area Galelarese settlements are found in the Kao District (Tabobo village), on the south coast of Halmahera, on Gunage and Moari Islands, on Bacan and Obi, and on the north-west coast of Halmahera south of the Loloda dialect area. In several Galela villages also other North-east Halmaheran dialects are spoken. The northern village of Susupu is mixed Galela-Loloda, three of the villages on Lake Galela are partially Tobaru speaking, and the five villages on the south shore of Galela Bay are mixed Galela-Tobelo. An estimated 30,000 people, of whom 6,000 live on Morotai Island, speak Galela.

There is almost no information on subdialectal variation. The Galela spoken near the township of Kedi on the north-west coast is said to be slightly different from Galela as spoken on the east coast. My sample of that variant does not show any sound shifts and only one lexical difference.

One feature which, among the North-east Halmaheran dialects, is characteristic of Galela (but which it shares with Ternate-Tidore) is that bisyllabic words which originally ended in a consonant have lost this consonant, whereas Loloda, Tobelo, Tobaru, and Modole added a vowel, e.g. Ga *odo*: Lo *ojomo*: To *odomo*⁸: Tb *odomo*: Mo *odomo*: Pa *oyom* 'to eat'.

Galela was the first North-east Halmaheran dialect to be studied in detail as the Galela people were the first to be christianised by the missionaries of the Utrechtsche Zendingsvereniging (a Dutch Protestant Mission organisation based in Utrecht). In the 1860s these were allowed to establish a mission station on a small peninsula in Lake Galela which, the Galelarese believed, was infested with evil spirits who would ensure the speedy departure of the unwelcome intruders. However, things turned out quite differently and in the decades that followed the missionaries not only made many converts, but also produced readers and religious literature (Polman, 1981 [73, 75, 82, 83, 84, 96]), a collection of folktales with Dutch translation (*Dijken 1895 [77]), two grammars (Baarda 1891 [30], reviewed by Kern 1891 [31], and *Baarda 1908 [45]), and a dictionary with supplementary grammatical notes and some folktales (*Baarda 1895 [34]). More recent studies are Yoshida 1980 (on folk orientation), Wada 1980 (a comparative study), and Shelden 1986. Two old wordlists, one dating from 1895 and one from 1904 have been published by Stokhof (Stokhof, ed. 1980). The Galela dialect is at present being studied by Howard and Deidre Shelden of the Summer Institute of Linguistics (see also Shelden 1985).

2.4.2 LOLODA

This dialect is spoken along the north-west coast from the tip of the peninsula to just north of Kedi, on the North Loloda Islands of Salangadeke, Dedeta, Tuakara, and Doi; in Bosala village south of Kedi, and in Tuguraci village on the north shore of Dodinga Bay. In the northernmost Loloda villages Galela and Tobelo are spoken as well. The village of Posiposi consists partly of Loloda speakers and partly of immigrants from the Sangir and Talaud Islands. The number of speakers is approximately 13,000. Locally one distinguishes between a northern and a southern variant of Loloda. However, the latter although nominally 'Loloda' is in fact a variant of Galela (see 2.4.1).

The only diagnostic sound correspondence for Loloda is $Lo\ j : Ga\ d, To\ t, y, Tb, Mo\ d, \emptyset, Pa\ y, \emptyset^9$ (see the example in 2.4.1).

Old wordlists of Loloda can be found in Bastian 1894 [33] and Stokhof, ed. 1980 (a list compiled by Van Baarda in 1904). Comparative notes on Loloda and Galela grammar supplemented by a few folktales were published by Van Baarda (*Baarda 1904 [40]). The only religious publication is the Gospel of St Matthew (Metz 1915 [92]). More recent studies involving Loloda are those of Yoshida and Wada mentioned in 2.4.1.

2.4.3 TOBELO

Tobelo is the most widespread of all North-east Halmaheran dialects. It is spoken on North Morotai, on the shores and in the hinterland of Kao Bay, except for an area south of the township of Kao where Pagu is spoken (see 2.4.6), and in the northern part of the north-eastern peninsula. In South Halmahera, Tobelorese settlers are found in Patani, Weda, and Gane. Outside Halmahera they live on Bacan, Obi, and the Raja Ampat Islands. It is not known how many expatriate Tobelorese there are and how many of them still speak Tobelo. On Morotai Island there are an estimated 5,000 Tobelo speakers, round Kao Bay there could be as many as 15,000.

On the northern peninsula at least six variants of Tobelo are spoken. Two of these extend beyond the peninsula: the Heleworuru¹⁰ variant is spoken along the east coast from Galela Bay to Katana village, about 20 km south of the town of Tobelo, as well as on north Morotai and in Fayaul village on the eastern shore of Kao Bay; the Boeng variant is spoken in all other Tobelo villages on Kao Bay

except for three villages at the bottom of the bay where the Dodinga variant is spoken. Boeng even stretches past the tip of the north-eastern peninsula to its east coast. Tobelo-Dodinga is spoken only in the isthmus of Dodinga which connects the northern peninsula with the hub of Halmahera. The other three variants are all spoken in the interior. Formerly they were lumped together under the name Togutil or Tugutil, the local label for all Tobelo speaking people living in the interior of Halmahera. One of them is spoken west of Lake Paca, in a new settlement at the southern end of the lake, and in the villages of Kusuri and Toboulamo. Another is spoken in Kukumutuk village, and the third in Popon, Sasur, and perhaps also in the coastal village of Patang which 70 years ago migrated from the Popon area to its present location, and in part of the township of Kao (see fn.15). But it is possible that these migrants now have adopted the Boeng variant.

The sound correspondences diagnostic for the six variants are:

He	Bo	Pa	Ku	Po	Do
<i>d</i> ¹¹	<i>d</i>	<i>y</i>	<i>y</i>	<i>y</i>	<i>y</i>
<i>h</i>	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>	<i>h</i>
<i>h</i>	<i>h</i>	<i>s</i>	<i>s</i>	<i>h</i>	<i>h</i>
<i>k</i>	<i>k</i>	'	<i>k</i>	<i>k</i>	<i>k</i>

(He - Heleworuru, Bo - Boeng, Pa - Lake Paca, Ku - Kukumutuk, Po- Popon, Do - Dodinga).

In the interior of the north-eastern peninsula still more 'Togutil' variants are said to be spoken, but so far no data have become available.

Apart from readers and religious literature (Polman 1981 [78, 79, 80, 81, 87]) the early missionaries published a Tobelo-Dutch dictionary plus supplement (*Hueting 1908a [46], 1935 [65]), a grammar (*Hueting 1936 [66]) and folktales (*Hueting 1908b [86]), all dealing with the Heleworuru dialect. There is one word list which purports to be in the Boeng variant (Roest 1905 [42]) but the Tobelo words in it do not have the *f* which is one of the characteristics of Boeng (see above). Other topics which attracted early attention were the practice of name taboo (Hueting 1901 [36], 1910 [47]) and name giving (Fortgens 1911 [49]). Modern works are the study of Tobelorese deixis by Taylor (1984), the comparative study by Wada (1980), and a number of ethnolinguistic studies: *Masinambow 1976 [69], Taylor 1980, and Yoshida 1980.

2.4.4 TOBARU

The main concentration of Tobaru speaking villages is round the Ibu Mountain west of the Modole area. To the north only a few Tobaru villages are found, all in the interior. To the south there is one Tobaru village on the upper Akelamo River, and a string of villages on and near the coast between Jailolo and Dodinga. The present distribution of these villages is a reflection of the former nomadic habits of the Tobaru people, who till the beginning of the 20th century used to roam the central mountain ranges between Mount Ibu and the isthmus of Dodinga, and from Mount Ibu as far north as Loloda Bay. Tobaru is also spoken by part of the inhabitants of four villages on Lake Galela (Map IV-B, No.15, 16, 19, 20), and in some settlements on the west coast of the southern peninsula: at Akelamo, in the bay of Payahi, and near Lifofa. The total number of Tobaru speakers lies somewhere between 10,000 and 15,000.

The Tobaru people round Mount Ibu recognise the existence of two subdialects characterised by the presence versus loss of *w*. The two variants seem to coincide with the traditional division into Upper Tobaru (Tobaru Nyeku) and Lower Tobaru (Tobaru Adu), with the former retaining *w*. For example Tb Nyeku *iwi* 'rattan', is Tb Adu *ii*.

The only study of Tobaru to date is a grammar by Fortgens (*Fortgens 1928 [64]) with added texts. Fortgens presumably based his grammar on the Tobaru variant spoken in the Jailolo-Dodinga area where he had his base as a missionary. Judging by his data this is the same variant as spoken by the Tobaru Nyeku. Old Tobaru word lists can be found in Bastian 1894 [33] and Hueting 1908 [44]. There is some religious literature by Fortgens: a bible translation and hymns (Polman 1981 [88, 89]).

2.4.5 MODOLE

Modole is spoken by about 1,800 people living on the headwaters of the Kao River. There are two subdialects, a northern and a southern. The northern variant has *h* where the southern has *s*. The people of Dimdim village on the lower Kao River formerly lived in the south Modole village of Soahukum of which they formed a division called Soasengaji. From there they moved to Leleseng, the northernmost Pagu village, before settling in their present location. According to my informants they now speak Pagu (see 2.4.6). Modole word lists have been published by Hueting 1908 [44], *Ellen 1916a [58], and Stokhof, ed. 1980 (a list dating from 1933). Ellen also published a collection of folktales and riddles (*Ellen 1916b [90]). More recent studies containing Modole data are Yoshida 1980 and Wada 1980. In the introduction to his word list, Ellen gives as a phonological characteristic of Modole that it has a glottal stop ' which corresponds to *k* in the other North-east Halmaheran dialects. I found the same feature in the inland variety of Tobelo spoken west and south of Lake Paca (see 2.4.3), which is the eastern neighbour of Modole. The shift from *k* to ' probably originated in Modole and spread from there to the Lake Paca variant of Tobelo.

2.4.6 PAGU

Pagu is spoken by between 2,000 and 3,000 people living in the south-eastern part of the peninsula. This dialect differs from the other North-east Halmaheran dialects (and in fact from all other NH languages) in that it allows consonants in word-final position (cf. 2.4.1). The oldest source on Pagu, Hueting 1908 [44], distinguishes two variants, Isam and Tololiku but the differences between the lists are so slight and unsystematic that they are probably due to notational errors more than to anything else. *Ellen 1916c [59] gives just one Pagu wordlist without mentioning any subdialectal variants. Grimes, in a recent conference paper (Grimes 1984) mentions three variants: Isam, Toliwiku (= Tololiku), and Pagu. Isam is spoken in the northern village of Leleseng and in Gayok village on the lower Kao River. Gayok was formerly located not far south of Leleseng on the Isam River; at that time the village was called Bililait. Toliwiku is spoken in Toliwang village on the river of the same name, not far south of the former village of Bililait. The Toliwang variant has *h* where the other Pagu variants have *s*, a phonological feature which it could have borrowed from the neighbouring Popon variant of Tobelo. The Pagu variant, according to Grimes, is spoken in the villages of Ngoali, Waringin-Lelewi, Wangeotak, and Balisosang. To these have to be added the villages Gagaapok, Momoda, the Pagu speaking quarter of the township of Kao, and possibly also the southernmost coastal village of Dumdum. Waringin and Lelewi now form the village of Golgol; Balisosang has moved south along the coast to Cape Loleo and has changed its name to Tomabaru.

My own data are restricted to a short word list of the Toliwang (Toliwiku, Tololiku) variant and three lists of the Pagu variant, collected in Kao, Ngoali, and Gagaapok. My 'Pagu' lists are practically identical to Huetting's Isam/Tololiku lists, so that either Huetting's lists are not Isam but 'Pagu', or the Isam - Pagu distinction is not a linguistic one but one of territorial groups.

As mentioned before, Pagu shares 81% cognates with its western neighbour Sahu. From the lexicostatistical point of view this would be an argument for including Sahu in the dialect chain of North-eastern Halmaheran. But there are three arguments against this. Firstly there is a sharp drop in cognation percentages when Sahu is compared with the other dialects of North-east Halmaheran (taking the Pa'disua dialect to represent Sahu): 75% with Modole, 69% with Tobelo, 67% with Tobaru, 65% with Loloda, and 64% with Galela. Secondly grammatically and typologically Sahu is clearly distinct from North-east Halmaheran (although the typological differences in Sahu might be attributable to recent external causes, see 3); and finally the oral tradition of the Sahu people traces their origin to the eastern side of the peninsula, from where they crossed the central ranges before settling in the Akelamo valley and along the west coast. This would mean that they at one time were the immediate neighbours of the Pagu speakers, and the high figure of 81% could therefore reflect an early borrowing relationship between Pagu and Sahu.

Apart from the literature mentioned above there is a collection of folktales (*Ellen 1916d [91]) and a word list dating from 1933 (Stokhof, ed. 1980).

3. THE NON-AUSTRONESIAN FEATURES AND TYPOLOGICAL CHANGE OF THE NH LANGUAGES.

The 'un-Indonesian' features of the North Halmaheran languages were already noticed as early as 1872 by Robidé van der Aa (1872 [29]). After comparing the numerals and a few nouns in those languages with the corresponding ones in some of the Austronesian languages in South Halmahera he concluded that the NH languages form a very divergent group, but believed that further research might eventually be able to prove their Austronesian character.

Of essentially the same opinion was Kern in his review of Van Baarda's Galela grammar (Kern 1891 [31]:494). The German missionary-linguist W. Schmidt however argued that the NH languages do not belong to the Austronesian languages but that they share important structural features with some Papuan languages in north-east New Guinea and Melanesia. On the basis of those features he classified them as 'Papuan' rather than Austronesian (Schmidt 1900-1901). Schmidt's arguments were later elaborated by Van der Veen in his Ph.D. dissertation in which he convincingly argued for the non-Austronesian character of the NH languages (*Veen 1915 [56]). He did not go into the question of a possible genetic relationship with Papuan languages however, as he considered this to fall outside the scope of his thesis (1915:226).

Van der Veen drew his arguments mainly from the dialects of North-east Halmaheran because grammatical data in Sahu were almost completely lacking and Ternate (-Tidore) had lost most of the non-Austronesian characteristics. West Makian, probably due to lack of reliable data, was not included in his study. The most important non-Austronesian features discussed by Van der Veen are:

1. In sentences containing a noun object this usually follows the noun subject (if any) and precedes the verb, for example:

o namoro no-totiri
 NM bird you-carry
 'you carry the bird!' (Tobaru example)

o uku to-taul
 NM fire I-light
 'I'm lighting the fire' (Pagu example)

o in these and the following examples is an obligatory noun marker (NM).

2. Transitive verbs can take prefixed subject and object markers; the object marker always follows the subject marker, for example:

ti-ni-paasana
 I-you pl-beat
 'I (shall) beat you (pl)' (Tobaru example)

The presence of the object marker is described by Shelden in a recent conference paper as a foregrounding device signalling high transitivity of the verb (Shelden 1985). The verbs in Example 1 would therefore be less transitive than the form *tinipaasana*. For Sahu the difference has been described as one of focus: in transitive verbs without an object marker the focus is on the action rather than on the patient (Visser and Voorhoeve 1987, Ch.4).

3. Nouns fall into two main classes, a person class and a non-person class, which require concord in the verbs, pronouns, and numerals. Within the person class there is a gender distinction manifesting itself in the pronouns and the pronominal verb prefixes, for example:

o nauru wo-tagi / unanga wo-tagi
 NM man he-go / he he-go
 'the man goes'/'he goes'

o moholehe mo-tagi / munanga mo-tagi
 NM girl she-go / she she-go
 'the girl goes'/'she goes'

o kaho i-tagi / enanga i-tagi
 NM dog it-go / it it-go
 'the dog goes'/'it goes' (Tobelo examples)

o nyawa yaruange
 NM people three
 'three persons'

o tahu saange
 NM house three
 'three houses' (Galela examples)

In Sahu the non-person class is subdivided into houses, trees, small objects, and other non-persons, with concord in the numerals (Visser and Voorhoeve 1987, Ch.8).

4. The use of postpositions instead of prepositions as in the Austronesian languages, for example:

o naaraka ma igu ka
 NM spider its web in
 'in the spider's web' (Galela example)

However, prepositions also occur, as in

to-ni-gosa de o gota
 I-you-beat with NM stick
 'I'll beat you with a stick' (Pagu example)

5. In possessive noun phrases the possessor precedes the possessed and the two nouns are linked by a third person possessive pronoun¹², for example:

o baba awi tahu
 NM father his house
 'father's house'

o kaso ma pago
 NM dog its tail
 'the dog's tail' (Galela examples)

The full set of non-Austronesian features given above is only present in North-east Halmaheran. In Sahu the noun object is placed after the verb, and only prepositions are used. This language has subject and object prefixes, but the object marker is often omitted and replaced by a free pronoun following the verb. Ternate-Tidore and West Makian likewise place the noun object after the verb, have only prepositions, and in addition do not have prefixed object markers. West Makian has noun classes, like the other NH languages, but they are based on an animate-inanimate distinction, not on the person-non person contrast; it further lacks the masculine-feminine gender distinction. Summarising, the distribution of the five non-Austronesian features over the NH languages is as follows (NEH = North-east Halmaheran, SA = Sahu, TT = Ternate-Tidore, WM = West Makian; + = feature present, - = feature absent, x = noun classes based on different criteria).

Feature nr.	NEH	SA	TT	WM	
1	+	-	-	-	(SOV word order)
2	+	(+)	-	-	(subj. + obj. prefixes)
3	+	+	+	x	(noun classes)
4	+	-	-	-	(postpositions)
5	+	+	+	+	(Possr-Possd construction)

Thus, one of the four NH languages has a dominant clause constituent order Subject-Object-Verb, the others have Subject-Verb-Object order. Cross-linguistically there is a high correlation between SOV order and postpositions. The presence of these in NEH is therefore what could be expected. Similarly, there is a high cross-linguistical correlation between SVO order and prepositions; SA, TT, and WM conform to this pattern. As the four languages ultimately derive from one protolanguage it is obvious that a typological change has taken place. This must have been a change from a dominant constituent order SOV to SVO. Cross-linguistic research has shown that there are no known cases in which a language changed naturally from SVO to SOV order (Steele 1978, see also the discussion in Ross 1986:18). Where such a change has occurred, as in a number of Austronesian languages in

New Guinea, the new order is due to borrowing from non-Austronesian languages with a dominant SOV order. Such conditions are absent in the North Halmahera area, where all the surrounding Austronesian languages have SVO as the dominant constituent order. On the other hand, the change from SOV to SVO can occur both naturally and as the result of borrowing. In the case of the NH languages it seems probable that the change from SOV to SVO has been caused by centuries or even millennia of contact with speakers of Austronesian languages.

4. EXTERNAL GENETIC RELATIONSHIPS: THE WEST PAPUAN PHYLUM

As early as 1900 the German linguist Schmidt attached the label 'Papuan' to the NH languages because of the structural features they shared with some Papuan languages in north-east New Guinea and Melanesia. The total lack of lexical correspondences did not carry any weight in his opinion, because at that time the lack of lexical correspondences between Papuan languages, even when spoken in one another's immediate vicinity, was thought to be a peculiarity of them as a group (*Veen 1915 [56]:226). Schmidt's use of the label 'Papuan' can therefore not be taken to refer to a genetic relationship but at the best to a typological relationship. The first to posit a genetic relationship between the NH languages and other groups of non-Austronesian languages was Cowan who in a series of articles between 1957 and 1965 posited the existence of a large phylum of languages which included the NH languages, almost all the languages in the Bird's Head Peninsula of Irian Jaya, the Yawa language on Yapen Island in Cenderawasih Bay, a few languages on the Bomberai Peninsula, and the non-Austronesian languages in the Timor-Alor-Pantar area (see Cowan 1965, especially the bibliographical references cited in fn.7 of that article). The peculiar lexicostatistical method he used however allowed him to posit genetic relationship between languages which later research has shown to be unrelated. Moreover, the quality of the data he worked with was often poor, and he sometimes did not recognise lexical correspondences caused by borrowing from Austronesian sources. But in two respects he was right: there is genetic relationship between the non-Austronesian languages in the Timor-Alor-Pantar area and languages on the Bomberai Peninsula and along the south coast of the Bird's Head Peninsula; and there is genetic relationship between the NH languages and all the other languages in the Bird's Head except for the Tinam (Hatam) language in the Arfak mountains in the east of the peninsula. The Yawa language, called Mantembu by Cowan, is not related to any of those languages. The first group is now included in the Trans-New Guinea Phylum (Voorhoeve 1975a, 1975b; Capell 1975, editor's note), the second is still called the West Papuan Phylum.

Cowan based the claim for genetic relationship between the NH languages and those in the Bird's Head mainly on the observed similarity between the subject prefixes in the languages of the North Halmahera and West Bird's Head Families. To these morphemic correspondences he was able to add eight lexical correspondences. The West Bird's Head Family, consisting of the languages Moi, Seget, Tehit, and Moraid, is the nearest relative of the NH languages, and later research has shown that many more shared cognates can be added to Cowan's list. It is not my intention to go into details here, as this would fall outside the scope of the present paper. A selection of the prefixal correspondences and a few lexical correspondences are given below.

SUBJECT PREFIXES IN THE LANGUAGES OF THE NORTH HALMAHERA FAMILY AND IN MOI AND TEHIT OF THE WEST BIRD'S HEAD FAMILY			
	NHF	Moi	Tehit
Sg. 1	<i>to-</i>	<i>t(e)-</i>	<i>t-</i>
2	<i>no-</i>	<i>n(e)-</i>	<i>n-</i>
3 masculine	<i>wo-, o-*</i>	<i>w(e)-</i>	<i>w-</i>
feminine	<i>mo-</i>	<i>m(e)-</i>	<i>m-</i>
Pl. 1 inclusive	<i>po-, fo-, wo-*</i>	<i>waw-</i>	<i>f-</i>
exclusive	<i>mi-</i>	<i>mam-</i>	<i>m-</i>
2	<i>ni-</i>	<i>nan-</i>	<i>n-</i>
3	<i>yo-</i>	<i>y-</i>	<i>y-</i>

*: forms in different languages

SOME LEXICAL CORRESPONDENCES BETWEEN NORTH-EAST HALMAHERAN AND THE MOI AND TEHIT LANGUAGES			
	NEH (Galela, Pagu)	Moi	Tehit
'head'	<i>sahe, saek</i>	<i>sawa</i>	<i>safakos</i>
'fruit, eye'	<i>sopo, sowok</i>	<i>suwo</i>	<i>sfuon¹³</i>
'egg'	<i>gosi</i>	-	<i>esyen</i>
'man'	<i>ya-nau, naul</i>	<i>ne</i>	<i>nau</i>
'meat'	<i>lake, lakem</i>	<i>kem</i>	<i>qan</i>
'tree'	<i>gota</i>	-	<i>kot</i>
'water'	<i>ake, akel</i>	<i>kala</i>	<i>kla</i>
'to drink'	<i>oke, okel</i>	<i>ook</i>	<i>ooqo</i>
'to stab'	<i>saka, sakal</i>	<i>saa</i>	<i>sqaa</i>

5. AUSTRONESIAN INFLUENCE ON THE NORTH HALMAHERAN LANGUAGES






All North Halmaheran languages show the effect of long-lasting contact with Austronesian languages. Sahu, Ternate-Tidore, and West Makian have lost part of their non-Austronesian features and have moved towards a more Austronesian type grammar. And they all have absorbed considerable numbers of Austronesian loan words. Examples of the most obvious Austronesian loans abound in the early publications, but the extent to which Austronesian words have been borrowed and integrated into the North Halmaheran lexicons has always been underestimated. Around the turn of the century the comparative study of the Austronesian languages was still in its infancy and lists of reconstructed Proto-Austronesian forms which could facilitate the identification of loan words were simply not available. Thus Van der Veen (*Veen 1915 [56]:203) still writes that their number is restricted and he gives a short list of 46 words of 'Malayo-Polynesian' origin found in one or more NH languages. The publication of a Proto-Austronesian funderlist (Wurm and Wilson 1975), and numerous later lists of reconstructions at various levels has put us in a much better position to detect Austronesian borrowings. When collecting data for a preliminary lexicostatistical analysis of the NH languages I found that across the board more than 30% of the basic vocabulary was definitely or probably of Austronesian origin. Many of the loan words must be very old as they partake in all the regular sound shifts between the languages. Also, they seem to have come from

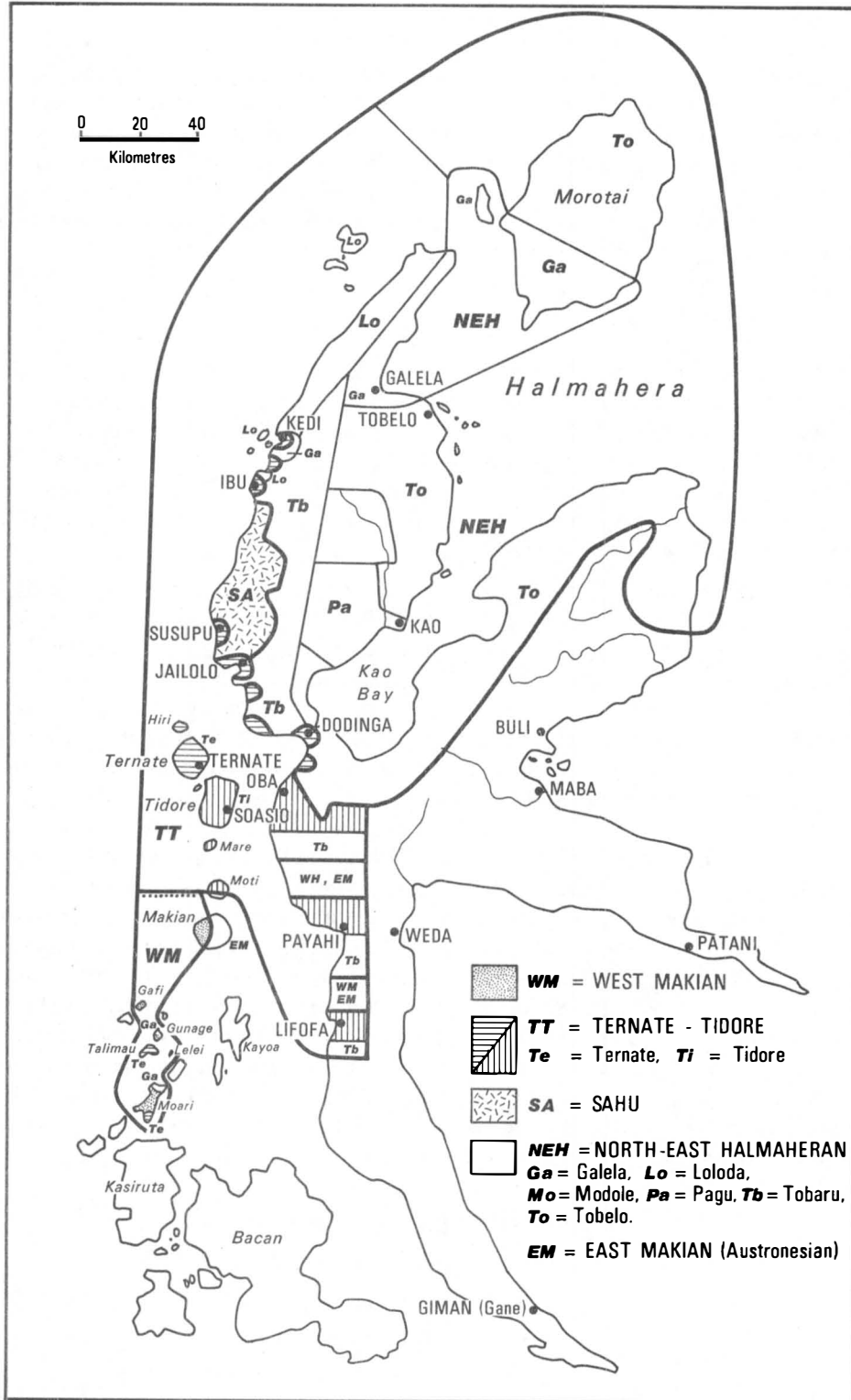
widely different sources. Many seem to have an Oceanic origin, quite a few have a Philippine origin, and still others seem to have come from the Central Moluccan languages (Ambon, Seram). The presence of such a variety of old Austronesian loans in the NH languages raises the question whether they can tell us something about the linguistic prehistory of the region. A first attempt to draw from them some conclusions regarding prehistoric contacts between the North Moluccas and other areas was made in my paper for the TICAL conference (Voorhoeve 1982b). In it I argued for the probability of prehistoric traffic between the North Moluccas and the eastern tip of Papua New Guinea. Whether the hypothesis will stand up to further research remains to be seen.

6. MAPS AND VILLAGE LISTS

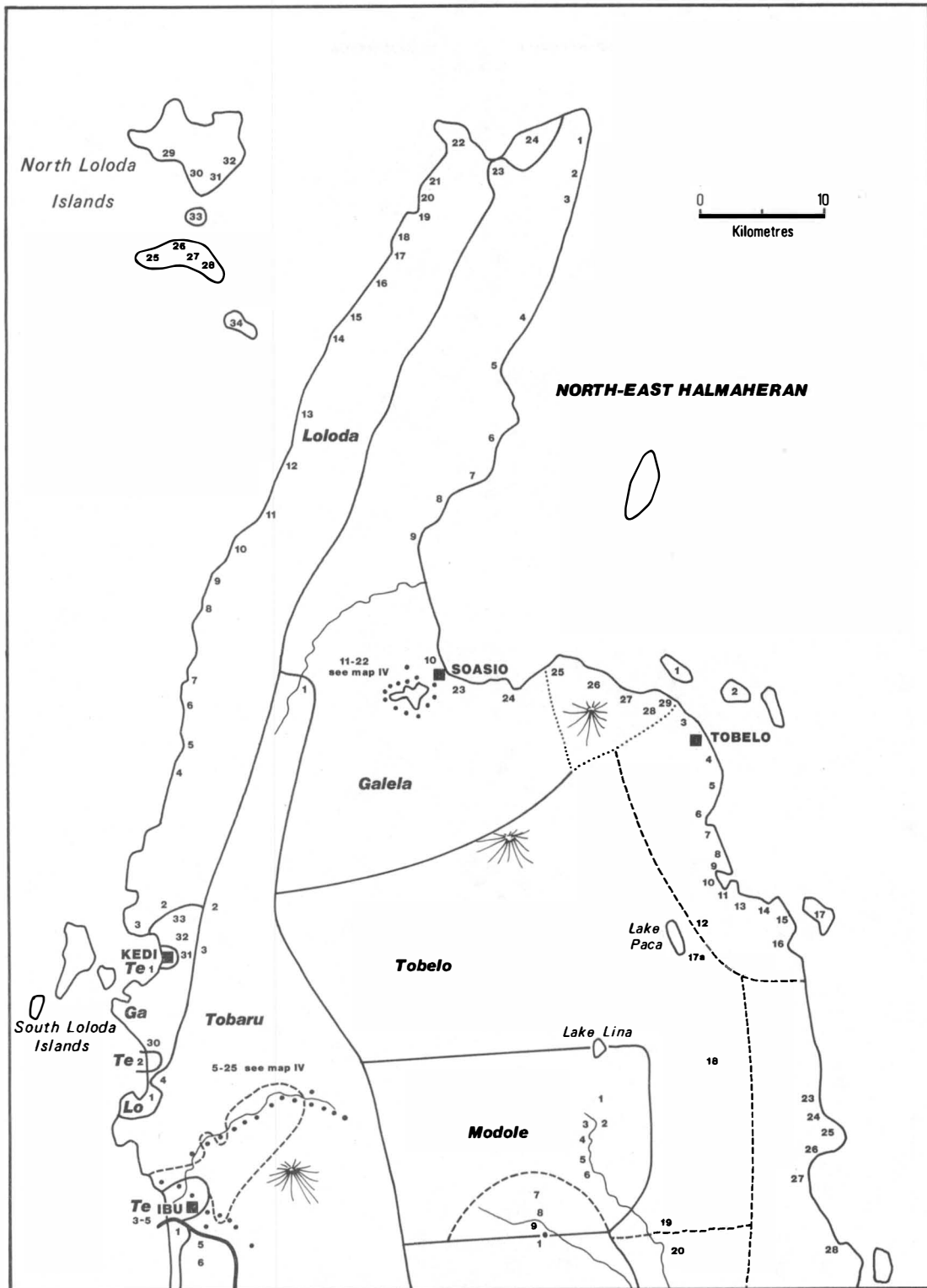
The first language map of the North Halmaheran languages was published by Hueting in his survey article 'Iets over de "Ternataarisch-Halmaherasche" taalgroep' (Hueting 1908 [44]). The map shows the approximate location of 13 'dialects': Ternate, Tidore, Waioli, Ibu, Tabaru, Loda, Galela, Tobelo, Madole, Isam, Tololiku, Tugutil, and Kau.¹⁴ It is not very accurate and the Isam area is erroneously labelled Tololiku and vice versa. A special Kao dialect – according to Hueting a mixture of Ternate, Tobelo, Modole, and Pagu – may perhaps still be spoken in the township of Kao, but certainly not in the interior as the map suggests.¹⁵

In the 50 years following Hueting's article very little was added to the knowledge of the geographical distribution of the NH languages as is shown by the map of the area in Salzner's *Sprachenatlas des indopazifischen Raumes* (Salzner 1960, Map No.29). Though richer in non-linguistic detail it contains little more linguistic information than Hueting's map and where it adds to it, as in the indication of Sahu and Tobelo dialects, it is inaccurate. The most recent language map of North Halmahera (in Wurm and Hattori 1983, No.45) although better than the earlier ones, still contains several inaccuracies due to the fact that my field data on which it is based had not yet been properly worked out when the cartographer needed them. Thus the division into languages and dialects is still the old one, the location of the Sahu dialects is inaccurately indicated, and the indication of subdialects in Tidore, Pagu, Tobelo, Galela, and Loloda needs to be revised. I have therefore added here a revised general map of the area and three more detailed maps showing dialect and subdialect boundaries as far as they are known, as well as all the villages whose location I could identify. As the scale of the maps did not allow the inclusion of all the village names these have been listed separately together with an indication of the language, dialect, and subdialect (if known) spoken in them. On the maps most villages are identified by a number corresponding to their number in the list. The level of completeness and reliability of the maps varies from area to area. The most complete and accurate data are from the northern peninsula, Ternate, Tidore, and Makian, the areas which I visited personally. For the north-eastern peninsula I had to rely on information supplied by Taylor (personal communication) and for the southern peninsula and the islands south of Makian on Watuseke (Watuseke 1976 [70], and personal communication). Linguistic boundaries are indicated in the following way:

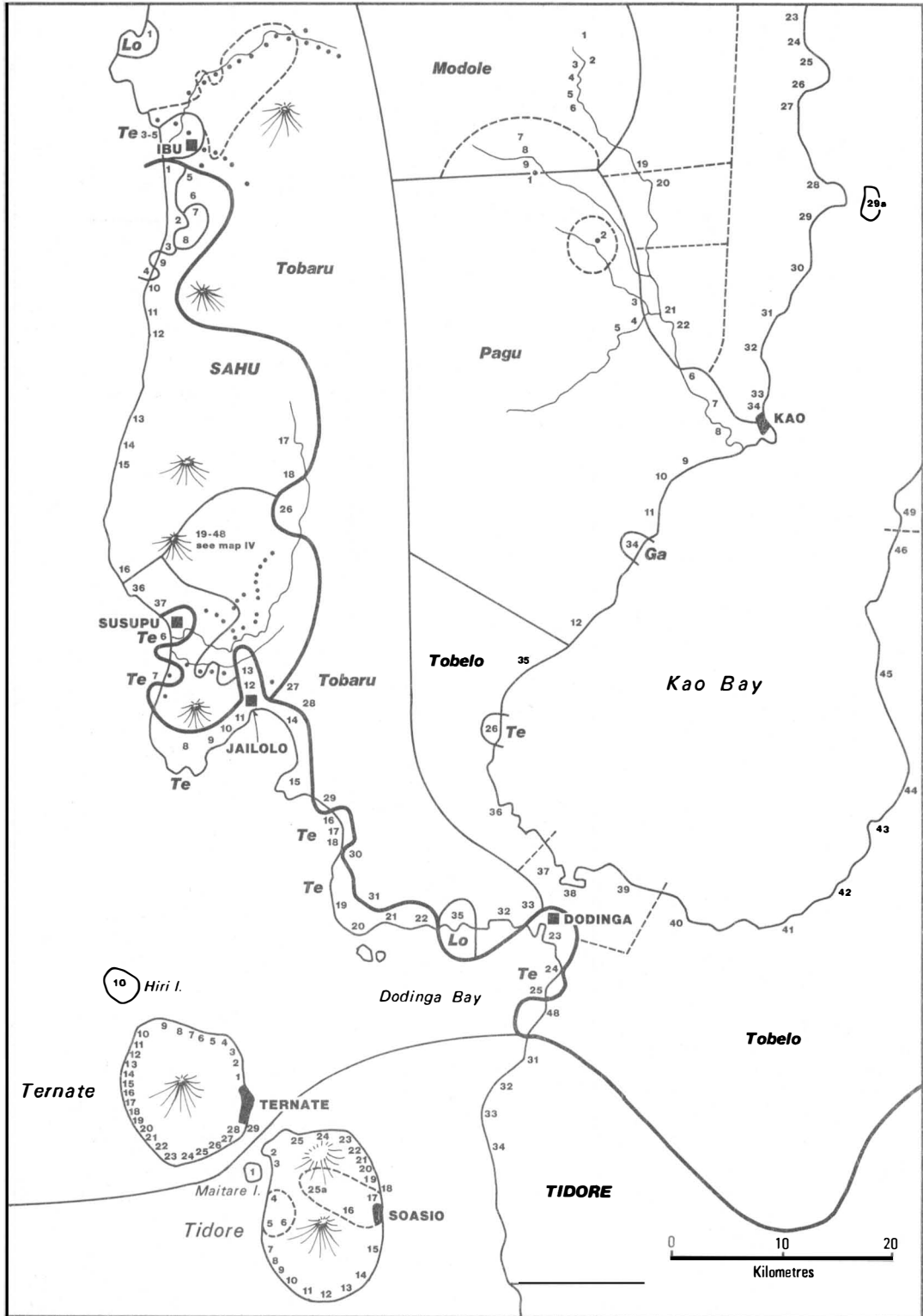
-  language family boundary
-  language boundary
-  dialect boundary
-  subdialect boundary
-  encloses an area of dialect overlap



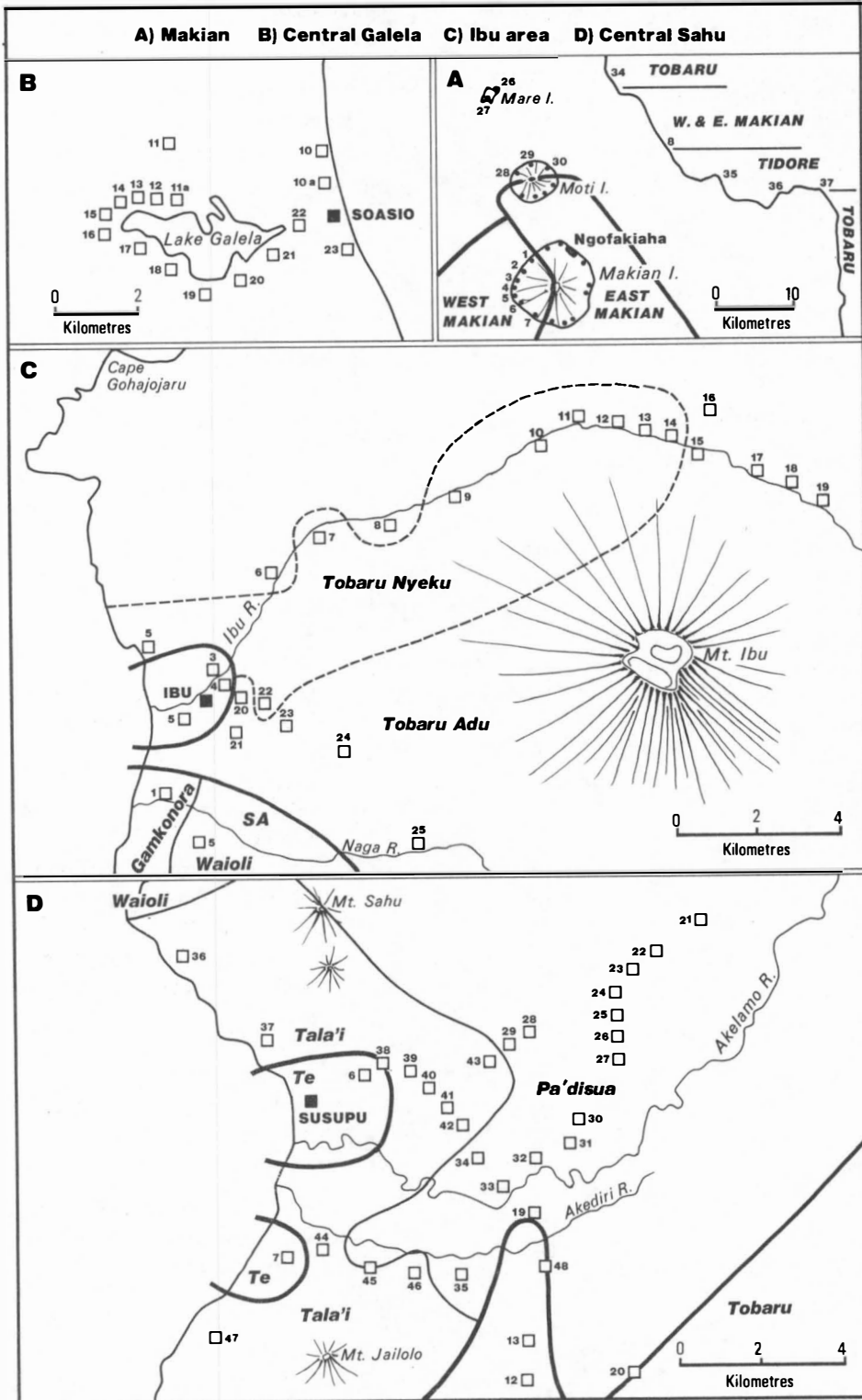
MAP I: THE NORTH HALMAHERAN LANGUAGES



MAP II: NORTH HALMAHERAN LANGUAGES



MAP III: NORTH HALMAHERAN LANGUAGES



MAP IV:

LIST OF VILLAGE NAMES

MAP No.

WEST MAKIAN

1	Sabale	IV-A
2	Talapao	IV-A
3	Tafasoho	IV-A
4	Tagono	IV-A
5	Ngofa Bobawa	IV-A
6	Bobawa	IV-A
7	Malapa	IV-A
8	Lola (on the Halmahera mainland)	IV-A

TERNATE-TIDORE

Ternate (on the islands Hiri and Ternate)

1	Dufa-dufa	III
2	Akehuda	III
3	Tafure	III
4	Sango	III
5	Tarau	III
6	Kulaba	III
7	Bula	III
8	Tobolulu	III
9	Sulamadaha	III
10	Dorari Isa	III
11	Takome	III
12	Labuha	III
13	Banedinga	III
14	Loto	III
15	Akerica	III
16	Togafo	III
17	Afe	III
18	Taduma Doropedu	III
19	Monge	III
20	Batumerah	III
21	Rua	III
22	Kastela	III
23	Jambula	III
24	Sasa	III
25	Gambesi	III
26	Fitu	III
27	Ngade	III
28	Kalumata	III
29	Sorofo	III

Ternate (on the mainland of Halmahera)

1	Kampung Soasio (part of Kedi)	II
2	Tolofu	II
3	Gamlamo	IV-C
4	Gamici	IV-C
5	Ibu Pantai	IV-C
6	Tacim (partly Sahu speaking)	IV-D
7	Marimbati	IV-D
8	Bobo-Payo	III
9	Bobane-Hena	III
10	Galala	III
11	Guae-ma-adu Jailolo (kota)	III
12	Gufasa	III
13	Soakonora	III
14	Toada	III
15	Matui	III
16	Tauro	III
17	Tataleka	III
18	Gamlenge (partly Tobaru speaking)	III
19	Sidangoli Gam	III
20	Sidangoli Dehe	III
21	Ake Jailolo	III
22	Bia-ma-ahi (immigrants with Austronesian language background)	III
23	Dodinga (partly immigrants with Austronesian language background)	III
24	Tewe (partly Tobelo speaking)	III
25	Toniku (partly East Makian speaking)	III
26	Akelamo Kao	III

In the Sahu language area, Ternate is spoken by part of the inhabitants of Tedeng (Sahu 19) and Akediri (Sahu 48).

TIDORE

1	Kailupa	III
2	Rum Lama	III

3	Rum Baru	III	Waioli:		
4	Ome (Mareku subdialect)	III	5	Togola Sangir (originally immigrants from Sangir)	II, III
5	Mareku (Mareku subdialect)	III	6	Togola Waioli	II, III
6	Afa-afa (Mareku subdialect)	III	9	Bataka	III
7	Bobo	III	10	Jere	III
8	Toloa	III	11	Nanas	III
9	Dokiri	III	12	Kampung Baru	III
10	Tuguiha	III	13	Tabobo	III
11	Tomalou	III	14	Goro-goro	III
12	Gurabati	III	15	Sasur	III
13	Tongowai	III	16	Peot	III
14	Sele	III	17	Tosoa	III
15	Soadara	III	18	Togoer	III
16	Folarora	III	19	Tedeng (plus speakers of Ternate, Tobaru, and Austronesian languages)	IV-D
17	Gamtofkange, Kota ma Bopo, Indonesiana	III	Pa'disua:		
18	Goto	III	20	Porniti (mainly Tobaru speaking)	IV-D
19	Dowora	III	22	Gamsungi (originally Loloda speakers)	IV-D
20	Doyado	III	23	Ngaon	IV-D
21	Akesahu	III	24	Campaka	IV-D
22	Suru-ma-lao	III	25	Gamniel	IV-D
23	Gamgau	III	26	Hoku-hoku Gam	IV-D
24	Mafututu	III	27	Tibobo	IV-D
25	Cobo	III	28	Taraudu	IV-D
25a	Kalodi cluster: Gulili, Kola, Dola, Dola Gosora, Togona (Soasio subdialect)	III	29	Tacici	IV-D
26	Mare	IV-A	30	Aketola	IV-D
27	Kofo	IV-A	31	Awer	IV-D
28	Fitako	IV-A	32	Kusu	IV-D
29	Tafamutu	IV-A	33	Akelamo	IV-D
30	Kota	IV-A	34	Gamomeng (Pa'disua + Tala'i)	IV-D
31	Guraping	III	35	Hoku-hoku Kie	IV-D
32	Sofifi	III	48	Akediri (partly Ternate speaking)	IV-D
33	Oba	III	Tala'i:		
34	Somahode	III	36	Todahe	IV-D
35	Fita	IV	37	Taruba	IV-D
36	Toseho-Tobabu	IV	38	Tacim (partly Ternate speaking)	IV-D
37	Payahi	IV	39	Balisoan	IV-D
38	Lifofa	I	40	Golo	IV-D
SAHU			41	Idam Gamlamo	IV-D
Gamkonora:					
1	Tahafo	II, III			
2	Gamkonora	III			
3	Talaga	III			
4	Gamsungi	III			

42	Loce (Tala'i + Pa'disua)	IV-D
43	Worat-worat	IV-D
44	Gamtala	IV-D
45	Lolori (Tala'i + Pa'disua)	IV-D
46	Taboso	IV-D
47	Idam Dehe	IV-D

Intrusive languages:

7	Sarau (speak a mixture of Tobelo and Galela locally known as 'Tobelo Tiana')	III
8	Tobelos (speak a mixture of Tobelo and Galela locally known as 'Tobelo Tiana')	III
21	Taba Campaka (East Makian immigrants)	IV-D

NORTH-EAST HALMAHERAN

Galela:

1	Jere	II
2	Kampung Baru	II
4	Saluta	II
5	Tutu-ma-loleo	II
6	Salimuli	II
7	Bobisingo	II
8	Lalonga	II
9	Limau	II
10	Simau	II, IV-B
10a	Toweka	IV-B
11	Ngidiho	IV-B
12	Gotalamo	IV-B
13	Duma	IV-B
14	Dokulamo	IV-B
15	Soatobaru (partly Tobaru speaking)	IV-B
16	Samuda (partly Tobaru speaking)	IV-B
17	Bale	IV-B
18	Igobula	IV-B
19	Soakonora (partly Tobaru speaking)	IV-B
20	Togawa (partly Tobaru speaking)	IV-B
21	Seki	IV-B
22	Tuara	IV-B
23	Pune	IV-B
24	Mamuya	II

25	Luari (partly Tobelo speaking)	II
26	Ruko (partly Tobelo speaking)	II
27	Mede (partly Tobelo speaking)	II
28	Popilo (partly Tobelo speaking)	II
29	Goru (partly Tobelo speaking)	II
30	Tuguis (south of Loloda)	II
31	Kedi (except for Kampung Soasio which is Ternate speaking)	II
32	Laba Besar	II
33	Laba Kecil	II
34	Tabobo (enclave in Pagu territory)	III

Intrusive languages:

3	Pelita I (Sangir immigrants)	II
1 la	Makete (Sangir immigrants)	II

Loloda:

1	Bosala	II
2	Bakum	II
3	Puo	II
4	Bakun Pantai	II
5	Tosomolo	II
6	Barataku	II
7	Gamkahe	II
8	Pumadada	II
9	Baja	II
10	Apulea	II
11	Asimiro	II
12	Momojiu	II
13	Dotia	II
14	Ngajama	II
15	Dorume	II
16	Kailupa	II
17	Gisik (partly Tobelo speaking)	II
18	Galuo (partly Tobelo speaking)	II
19	Kapa-kapa (partly Tobelo speaking)	II
20	Pocao (partly Tobelo speaking)	II
21	Tate (partly Tobelo speaking)	II

22	Posi-posi (part of the inhabitants come from the Sangir - Talaud Islands)	II	(Boeng subdialect)	23	Gulo	III
23	Supu (partly Galela speaking)	II		24	Tunuo	III
24	Igo	II		25	Wateto	III
25	Jikolamo	II		26	Pediwang	III
26	Dagasuli	II		27	Bori	III
27	Dedeta	II		28	Doro	III
28	Fitako	II		29	Daru	III
29	Cerah	II		29a	Bobale	III
30	Dowonggila	II		30	Gamlaha	III
31	Dama	II		31	Biang	III
32	Salube	II		32	Patang (Boeng? migrated to the coast from the Popon-Sarur area, see 2.4.3)	III
33	Tuakara	II		33	Kusu	III
34	Tobo-tobo	II		34	Jati	III
35	Tuguraci (located on Dodinga Bay)	III		35	Akesahu	III
	Tobelo:			36	Akelamo Gamsungi	III
	(Heleworuru subdialect)			40	Pintatu	III
1	Tolonuo	II		41	Ekor	III
2	Kokara	II		42	Minamin	III
3	Wari (has many Sangir immigrants)	II		43	Saulat	III
4	Wosia	II		44	Wajoi	III
5	Pitu	II		45	Loleba	III
6	Upa	II		46	Wasile	III
7	Gamhoku	II		47	Tewe (partly Ternate and East Makian)	III
8	Efi-efi	II		48	Rioribati	III
9	Tomahalu	II			(Dodinga subdialect)	
10	Kupa-kupa	II		37	Tetewang	III
11	Paca	II		38	Bobane Igo (also speakers of Ternate and Gorap, an Austronesian language)	III
12	Tobe (partly Tobaru speaking)	II		39	Pasir Putih	III
13	Leleoto	II			Tobaru:	
14	Yaro	II			(Tobaru Nyeku subdialect)	
15	Mawea	II		5	Tobato	IV-C
16	Katana	II		7	Teongowango	IV-C
17	Miti	II		9	Duon	IV-C
49	Fayaul (on the opposite shore of Kao Bay)	II		10	Tokuoku	IV-C
	(Inland subdialects)			11	Goin	IV-C
17a	Telaga Paca (variant I)	II		12	Soasengaji	IV-C
18	Kusuri (variant I)	II		13	Sengaji Nyeku	IV-C
19	Toboulamo (variant I)	II		14	Tuguis	IV-C
20	Kukumutuk (variant II)	II, III		22	Tongute Goin	IV-C
21	Popon (variant III)	III				
22	Sasur (variant III)	III				

(Tobaru Adu subdialect)		2 Pitago	III
6 Podol	IV-C	3 Bailengit	III
8 Togowo	IV-C	4 Soa-ma-etek	III
15 Borona	IV-C	5 Parseba	III
16 Todoke	IV-C	6 Tuguis	III
17 Poralulu	IV-C	(southern subdialect)	
18 Tolisaor	IV-C	7 Soahukum	III
19 Togoreba Tua	IV-C	8 Tolabit-Torawat	III
20 Tongute Sungai	IV-C	9 Soasengaji	III
21 Akesibu	IV-C		
23 Maritano	IV-C	Pagu:	
24 Keici	IV-C	(Isam subdialect)	
25 Naga	IV-C	1 Leleseng	III
(subdialect unidentified)		8 Gayok	III
1 Roko	II	(Toliwiku subdialect)	
2 Jano	II	2 Toliwang	III
3 Tasie	II	(Pagu subdialect? possibly = Isam)	
4 Totala	II	3 Gagaapok	III
26 Goal	III	4 Ngoali	III
27 Buku-ma-titi	III	5 Momoda	III
28 Todowongi	III	6 Dimdim (originally south Modole)	III
29 Bukubualawa	III	7 Lelewi	III
30 Gamlenge (partly Ternate speaking)	III	9 Wangeota	III
31 Domato	III	10 Malifut (also many East Makian immigrants)	III
32 Akeura	III	11 Tomabaru (formerly Balisosang)	III
33 Akelaha	III	12 Dumdum	III
34 Akelamo (on the southern peninsula)	IV-A		
Modole:			
(northern subdialect)			
1 Kai	III		

POSTSCRIPT

The maps and village list give only a very simplified picture of the linguistic situation in the area. Nothing has been said about the variety of languages spoken in the larger and smaller towns, and the degree of multilingualism present in towns and villages alike. How complex the situation is, can be deduced from Paul Taylor's informative article 'North Moluccan Malay: notes on a "substandard" dialect of Indonesian' (*NUSA, linguistic studies of Indonesian and other languages in Indonesia*, vol.17, 1983:14-27) in which he describes the multilingualism present in Wasile village on Kao Bay. Unfortunately such sociolinguistic studies are sadly lacking for the remainder of the North Halmahera area.

C.L. Voorhoeve, Canberra, December, 1986.

NOTES

1. See the entries Chlenov, Collins, Shelden, Taylor, Teljeur, Visser and Voorhoeve, Voorhoeve, Wurm and Hattori in the bibliography.
2. More details are given in section 4.
3. The Annotated Bibliography erroneously gives 1907 as the year of publishing.
4. A detailed map of the West Makian villages on these islands can be found in *Watusoke 1976 [70].
5. Alfoors (Dutch: Alfoeren) the local term was (*h*)*alifuru*. It referred to the 'uncivilised' autochthonous populations living in interior of the larger islands of the Moluccas.
6. 'd symbolises a voiced implosive alveolar stop. ' followed by a vowel stands for a glottal stop.
7. The Ibu list is somewhat shorter than the lists in the other Sahu dialects, counting only 83 items. According to lexicostatistical theory the resulting cognation percentages should then be inflated by about 2%. My impression from the additional (non-basic) lexical data in Ibu is that adding the missing items would hardly make any difference.
8. For Tobelo *d* see Note 11.
9. In some phonological environments the corresponding sound is *d* in Modole, *y* in Pagu; in others it has disappeared (symbolised by \emptyset). In Tobelo, *d* and *y* are distributed over different subdialects (see 2.4.3).
10. The name Heleworuru for this dialect was first used by Taylor (1980). In older publications it was simply called 'Tobelo' as distinct from Tobelo-Boeng and Tobelo-Dodinga.
11. Tobelo *d* confounded the early Dutch missionaries who described it as an 'impure' *l*. It is in fact a sound which is realised by some speakers as a palatalised lateral [*l'*] or a palatalised voiced interdental fricative [*ð'*] (I noted both variants in the speech of one and the same speaker), by others as a voiced interdental fricative [*ð*]. Sophisticated Tobelo speakers sometimes substitute *l* for it in conversation with speakers of other North-east Halmaheran dialects.
12. Capell (1975) when discussing the non-Austronesian features of the North Halmaheran languages remarks that the possessive construction 'is not an AN type, but is found in some AN languages where it calls for an explanation'.
13. The Galela and Pagu forms mean 'eye', the Moi and Tehit forms 'fruit'. The semantic shift from 'fruit' to 'eye' is well attested in Papuan languages on the New Guinea mainland, where often a parallel is drawn between parts of the body and parts of trees.
14. Some of the names are now spelled differently: Tabaru = Tobaru, Madole = Modole, Loda = Loloda, Kau = Kao.
15. According to my Kao informants the township of Kao is divided into three quarters, Kusu, Jati, and Kao, which formerly were separate settlements but now form one built-up area. Kusu and Jati speak Tobelo-Boeng; within Kao one distinguishes Kao (Kristen) and Kao Islam. The former is a Pagu speaking community; the Kao Islam people originally came from Popon. They still go to the burial ground at the old village site on the upper Kao River to ask the ancestors for their blessing.

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ABBREVIATIONS:

- AnL* *Anthropological Linguistics*. Bloomington, Indiana.
- BijdrTLV* *Bijdragen tot de Taal-, Land- en Volkenkunde*. Foris Publications, Dordrecht-Holland. (Journal of the Koninklijk Instituut voor Taal-, Land- en Volkenkunde, Leiden).
- PL* *Pacific Linguistics*. Department of Linguistics, Research School of Pacific Studies, Australian National University, Canberra.
- ZAOS* *Zeitschrift für Afrikanische, Ozeanische und Ostasiatische Sprachen*. Berlin.
- SPMI* Seminar Penelitian Maluku dan Irian Jaya. Ambon, 23-28 January 1984. Organised by LEKNAS - LIPI and the Pattimura University.
- VKI* *Verhandelingen van het Koninklijk Instituut voor Taal-, Land- en Volkenkunde*. Foris Publications, Dordrecht-Holland.

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- 1916c *Woordenlijst van het Pagoe op Noord-Halmahera*. *BijdrTLV* 72:65-102.
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A PRELIMINARY SOCIOLINGUISTIC AND LINGUISTIC SURVEY OF MANUS PROVINCE, PAPUA NEW GUINEA

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1. INTRODUCTION

1.1 SURVEY

The survey of Manus Province described here took place from January 3rd until February 24th 1980, under the auspices of the Summer Institute of Linguistics (PNG Branch), in cooperation with the Bible Translation Association of Papua New Guinea.¹

The survey was divided into five stages:

1. Visiting government and church/mission leaders, and planning an itinerary.
2. Surveying the languages spoken on Los Negros, the eastern island adjacent to the main island.
3. A survey trip along the south coast, visiting Lowaia, Mbunai, Londru and Patu.
4. A survey trip along the north coast visiting Lessau, Bundralis, and Liap.
5. A survey of the language spoken in the vicinity of Lorengau. People from the more distant islands, who work in Lorengau were also interviewed.

1.2 THE ADMIRALTIES²

The Admiralty Islands, of which Manus is the principal island, are situated to the North of the Papuan mainland, at 2° longitude and at 146°-148° latitude.

Manus, the main island, consists mainly of lowland hill forest, as do most of the surrounding islands. To the extreme west and south, as well as in some other areas, there are mangrove swamps, while around Lorengau, the provincial centre, there is some grassland. In the north-east and south-east there are pockets of tree and palm swamp woodland. Mount Dremsel is the peak summit (718 metres) and from East to West the topographical profile consists of raised coral reefs, hills, low mountains, polygonal karst formations, then low mountains and hills again.

The geology consists of marine sediments (some volcanically derived) and some lavas and swamp deposits. Lou is a thermal area and Tuluman has recorded eruptions: both locations are near Baluan Island, south-east of the main island.

Rainfall, as recorded at Momote, averages 300-400mm per year, with peak months in March, June, July and December. Temperatures average 27°C, with May, October, and November the hottest, with a maximum of 30°C.

The people are most densely settled on Baluan Island (20-40 persons per square kilometre), and least in the Western parts of Manus Island (5-10 per square kilometre); elsewhere the rural population is 10-20 persons per square kilometre.

Lorengau is the province headquarters, as well as the agricultural centre, with a population of nearly 3,000. The workforce is fairly evenly spread over the following categories: primary production, manufacturing, building and construction, transport and communication, community and business services, and government.

Malaria in the area is hyperendemic, with 50-75% of the adults contributing to the spleen rate. There is an administration hospital in Lorengau and other health facilities in Lugos, Baluan, Momote, Bundralis, Patu and Lessau.

Local Government Councils were formed between 1950-1955, among the first on record in Papua New Guinea. There is a provincial office with supreme court, provincial court, as well as the local courts.

The main staples are taro and sago, supplemented by hunting and fishing. The main cash crop is coconuts (copra), although central marketing is an important avenue of exchange. In Lorengau there is an association of cooperatives and trade stores and other cooperatives are scattered throughout the Province.

There are over 20 government primary schools and over 30 mission ones. The missions in the Province are the Missionaries of the Sacred Heart, the Evangelical Church of Manus (Liebenzell mission) and the Seventh Day Adventist. In addition to the Primary Schools there are two High Schools and four Technical Colleges.

1.3 THE AIMS

There were several broad sociolinguistic aims of the survey:

1. To ascertain the attitudes of the people of Manus to English, Pidgin and the vernaculars.
2. To ascertain the current usage of the different languages, with a view to predicting trends in their future use.
3. To note social trends which may affect the usage of the various languages.

The purpose of this investigation was to ascertain whether a linguistic program, culminating in the development of written literature for some, or all, of the Manus vernaculars, would be a viable project; and whether it would meet felt needs which could not be satisfied in any other way.

In order to satisfy the sociolinguistic aims, several linguistic goals were also determined:

1. An evaluation of the synthesised material presented in Alan Healey (1976), but not particularly to take issue with the groupings of languages into families proposed by earlier linguists. Rather, it

was our concern to identify the relationships between the languages as they are today. This would allow us to establish those languages which appear closely related and therefore form a suitable group for simultaneous development projects, contrasted with those languages which are different enough to require a totally separate analysis and development.³

2. To present the broad linguistic characteristics of the indigenous languages of Manus.
3. To compile a directory of villages and languages.

1.4 METHODOLOGY

A basic sociolinguistics checklist was compiled by Dr Franklin to outline the type and range of information which was required. It was intended that this questionnaire should be tested, adapted, and commented on, so that it could be improved and standardised for further use. As far as was possible, the information elicited by means of the questionnaire was checked and elucidated by observation (see Appendix A).

The primary linguistics tool used was the SIL Standard Wordlist, which consists of 190 lexical and grammatical items. An attempt was then made to synthesise the data and make some general statements regarding the relationships and characteristics of the languages found on Manus.

2. SOCIOLINGUISTICS

Particularly in the rural areas, the vernacular language is still the first language learned by all the children, and is constantly used in a wide variety of situations.

Pidgin is known and used by the vast majority of the population, and there is also considerable borrowing of Pidgin into the vernaculars. Nonetheless, there is no evidence for the wholesale abandonment of the vernaculars in favour of Pidgin. In general, Pidgin was felt to be inadequate for expressing complex ideas or fine shades of meaning.

There is little doubt that the vernaculars are changing due to the influence of Pidgin and English, but as long as the rural areas maintain viable and vigorous communities, it is highly probable that they will also retain a distinct vernacular language.

2.1 LANGUAGE USE AND ATTITUDES (ENGLISH AND PIDGIN)

High School students and graduates can speak English reasonably well, but only those who go on to tertiary education and/or work outside Manus speak it truly fluently.

However, if they stay in, or return to Manus, where they have little opportunity to use it, their ability tends to decline in proportion to the length of time away from the English speaking area.

English has a certain prestige, and there is pressure on children to learn it if they can, for people realise it is an essential pre-requisite for higher education and lucrative employment.

Pidgin is spoken by almost everybody over the age of eight years. It is gradually picked up by children as they move beyond the confines of their home and village and as they mix with children from other areas at school. Ability in Pidgin is related to social mobility and the degree of contact with people of other language groups, as well as expatriates.

Pidgin is generally associated with any situation or event which is connected with Western culture: hospital, government, business, shops and the judiciary (especially the District Courts). In mixed communities such as Lorengau and Mission Stations one would also expect to hear more Pidgin.

However, it should be noted that Pidgin is not exclusively heard in the above situations. When people get together informally to talk, wherever they are, vernacular languages are heard at least as often, if not more often, than Pidgin.

Pidgin does not have any particular prestige; people have a pragmatic attitude towards it, viewing it as a language which is very useful for communicating with people from a different area, but which otherwise has very little inherent value. Although they expressed it in different ways, people were unanimous in voicing the opinion that Pidgin was not adequate for every conceivable linguistic context. They felt, in particular, that it was not adequate for problem solving, involved discussion, expressing abstract or otherwise complex ideas, etc. They felt that it was not a real language which belonged to a particular place, and that they could not speak it very well (although to our ears, they could). Others, like pastors, teachers and magistrates, were more lucid in noting the inadequacy of Pidgin for handling complex subjects.

When people sense that Pidgin is inadequate they tend to switch back and forth to English. On a number of occasions, in mixed company, where someone was addressing an audience in Pidgin, we noted a large number of English words, phrases, and even whole sentences, incorporated directly into the Pidgin discourse. The implication of this is that as Pidgin continues to develop, it will become more and more like English, and less and less like the vernaculars. This means that Pidgin will become increasingly incomprehensible and decreasingly useful to people from rural areas. Educated people felt that this was already happening, and that many people do not understand Pidgin as well as they might appear, or pretend to.

Many people expressed the opinion that Pidgin would soon replace the vernacular languages (although linguistically this is debatable). However, they viewed this prospect with distaste, and would be very happy to see this trend reversed.

2.2 LANGUAGE USE AND ATTITUDES (VERNACULARS)

The vernacular is definitely the mother tongue of children growing up in Manus today, except possibly for Lorengau and other mixed community situations.

Learning of the vernacular first is the expected norm, and people of all ages hoped that it would continue. Those who return to Manus after a period away, are expected to, and do, revert very quickly to the vernacular. Those who marry into another community, learn the new language as a matter of course.

It is naturally used in the context of any village or traditional activity. It is also widely used in market and town situations. This is because 'wantoks' tend to converge wherever they are, but also because passive bilingualism is a major feature of the linguistic situation in Manus. The vernacular is also used as a bridge between the village situation and a foreign idea or project. For example, on nearly every occasion, the purpose of our visits to the various villages, was explained and discussed in the vernacular. In their opinion, the vernacular does not need explaining, as it is immediately understood, but that is not the case for Pidgin.

On the whole people do not approve of the influx of Pidgin words into the vernacular, although they feel this is inevitable. In any case they feel strongly that they would like to preserve their local language if this is at all possible.

2.3 LANGUAGE USE IN FORMAL CONTEXTS

In government affairs Pidgin is used primarily with a lot of English intermingled.

The official language of the judiciary is Pidgin, but the vernaculars are often used by the village magistrates. The magistrate from Loni uses the vernacular as a matter of policy. In his opinion, when people are upset, and have a problem which needs to be straightened out, then they need to express themselves in the vernacular; Pidgin is not adequate for expressing all the nuances of emotion and explaining all the factors involved.

English is the primary language of education, even in the Primary Schools, but vernacular can also be heard in the playground. When the school system started, Pidgin and vernacular were officially proscribed in and around the schools. Today this policy has been abandoned and there is an increasing interest in teaching children things about their own culture.

When mission work first started both the Manus Evangelical Mission (Liebenzell) and the Catholic Mission made an effort to use the local languages. The MEM adopted one language (Lele, also known as Tingo or Sabon) as the official mission language for use in school and church. They also produced a New Testament and a songbook in this language. However, if people from another language group wanted education or to be involved in the church they had to learn this language. Individual Catholic priests made an effort to use the language of the area where their mission station was situated and subsequently translated prayers and songs. Since the rise of Pidgin this policy has been abandoned in favour of Pidgin.

The official language of the Seventh Day Adventist Church is English, but apparently Pidgin and even sometimes the vernacular are also used.

2.4 LANGUAGE CHANGE

Almost everyone who was interviewed had the impression that their language was changing due to the influx of Pidgin words. In fact, the impression was so strong, that, in their opinion, their language would die out within ten years. Despite that, we formed the opinion that, although the languages almost certainly are changing, it is highly unlikely that the vernacular languages will completely disappear while people are still living and working in the rural areas. The reasons for this are as follows:

1. *Pidgin is inadequate.* People are aware of this and to compensate they borrow from English. This means that those who drop out of school at Standard Six and spend most of their time in a village situation, Pidgin will increasingly become as difficult to master as English. Furthermore, in Manus in particular, where passive bilingualism is so prevalent, it is possible to manage very well on very limited Pidgin. As a consequence it seems likely that the village people, in particular, will continue to depend heavily on their vernacular and will not switch entirely to Pidgin.

2. *Borrowing does not necessarily lead to uniformity.* Although all the vernaculars probably have borrowed from Pidgin, they almost certainly have not and are not doing so in a uniform manner, both

in terms of the actual items borrowed and in terms of the phonetic adaptations which may or may not take place. While people continue living in separate communities in relative isolation, it seems likely that the differences between the languages will be retained.

Borrowing and interaction between languages has always been a feature of the situation in Manus, but this has not led to uniformity. There are similarities between all the languages but the differences are still so great that people normally cannot understand another language the first time they hear it. Intelligibility comes through regular contact with the other language. The introduction of Pidgin is merely another stage in this process of change and is not necessarily the herald of the demise of the vernacular languages.

2.5 PASSIVE BILINGUALISM

This term refers to a situation where people from one language group can understand the speech of another language group, but cannot necessarily speak it and vice versa. In this way they can communicate by each speaking their own language. In the vast majority of cases, the languages are not sufficiently similar for an immediate understanding of a new language. Rather, this skill is acquired through contact with people from another language group. Historically, geographical proximity and trading alliances would have been contexts in which another language would have been learned. More recently, men such as pastors or teachers who travelled around a lot acquired a knowledge of a large number of languages. The people of Manus seem to have a very pragmatic attitude towards language. They are not isolationists who keep jealously to their own linguistic territory; instead they seem to have a very fluid concept of language boundaries. Consequently whenever people from different language groups meet, it is considered quite natural to learn some of the other language and even incorporate it into their own speech. Whenever a person goes to live in another community for any length of time (e.g. because of marriage), that person's facility with the new language would soon quite naturally extend from understanding to speaking.

It would be reasonable to assume that the introduction of Pidgin would have decreased the need for passive bilingualism, but in fact, it appears that the process has merely been extended to embrace Pidgin (and English) and has not been replaced. Today passive bilingualism is still widely used, even by young people. In the towns one hears it at least as much as Pidgin, if not more; and in the rural areas, people always use passive bilingualism, unless they are truly a long way from home.

It should also be noted that there has been a marked increase in mobility in recent years. There are more roads and Public Motor Vehicles, more and faster boats, fighting has ceased, and there are many incentives for regularly visiting Lorengau. This means that there is more contact with other language groups and thus more passive bilingualism. These factors alone should ensure that passive bilingualism will at least hold its own against Pidgin, even if it does not increase.

2.6 LANGUAGE LEARNING PATTERNS

We noted several different language learning patterns which would apply to children born of parents from Manus:

1. Parents from different language groups living in Lorengau or (particularly) living elsewhere in PNG probably communicate mainly in Pidgin.

Children will therefore probably learn Pidgin first. If for any reason the children go back to the village, either for visits, or to stay for longer periods with grandparents etc., they are expected to learn at least some of the vernacular.

2. Parents from the same language group living in town situation will probably communicate in the vernacular in the home and children will learn this first. However, they will tend to pick up Pidgin more quickly and more thoroughly due to the need to use it outside the home.

3. Parents from different language groups who live in rural areas (normally the wife would go to the husband's village) will communicate by passive bilingualism and some Pidgin, especially if the language groups are not very close.

Children will tend to learn the mother's language first, but will very soon become fluent in the language of the village they are living in. This will be especially true as the mother becomes more fluent in the father's language.

4. Parents from the same language group living in their own community will definitely communicate in the vernacular and the children will grow up speaking it. They will pick up Pidgin much later as soon as they begin to have contact with people outside the community, for example, at school.

On the whole it seems that attitudes to language learning are very pragmatic. It is certainly considered normal to learn the language of the area where one lives as well as the language of ones parents, but nonetheless people will always use the language which is the easiest and most natural in any given situation. In thoroughly mixed communities, especially outside of Manus, this will almost inevitably be Pidgin.

Nonetheless, parents still have sufficient pride in their mother tongue that they would like their children to learn it, if at all possible, and they regret their own declining ability to use and fully control their use of their vernacular language.

2.7 SOCIAL MOBILITY

Due to the influence of the missions and the Paliu Movement, education came early to Manus, and today every village has access to a Primary School and there is a government High School (up to grade 10) at Lorengau, as well as a Catholic Mission High School at Papitalai. It seems that many of the Manus people had the aptitude and the ability to adapt to Western education and culture. In addition, the older people were quick to see the advantage of having children who could get jobs and send money home. Consequently, in the last 20 years large numbers of young people have left home to work elsewhere in PNG, and many of them have risen to positions of importance and influence.

It would be very interesting to compare census figures over the last 20 years to see what specific influence this migration has had on the population of Manus. The impression we gained on our visit, is that the population is probably holding its own, neither increasing nor decreasing. The evidence which supports this is as follows:

1. Although children are encouraged to do well at school and migrate to the mainland, the parents still see to it that one or two (often a boy and a girl) stay at home. This emerged as a regular pattern in our study. In addition, only a small percentage can go on to High School. Although some with a Standard Six education are able to get employment, it still means that a fairly large proportion of each age group have no alternative but to remain in the village.

2. Those who migrate often return. This is because there is often social pressure to marry back into the home community. In addition parents, as they get older or sick, need children at home to look after them; they need girls to look after the gardens, boys to run businesses (copra etc.) to take over kin responsibilities, to inherit the family land and continue the family line.

People also often return to look after a sibling's family if there has been bereavement. In cases of divorce, separation or bereavement, migrants (women especially or their children) will often return to the home community.

Even when people qualify in their particular profession, many voluntarily obtain posts back in Manus. The majority of government officials, teachers, and hospital staff, whom we met, were originally from Manus. Some people speak too, of retiring back to their villages, and in preparation, have even started building very comfortable homes there.

The present generation of Manus people are true social pioneers: they somehow have to harmonise the traditional culture of their parents, and the new Western culture which they have learned to adjust to. However, we detected a strong determination to do what was possible to retain both the traditions and the language of their ancestors. No doubt changes will come, but it seems likely that the people will seek a solution in terms of combination and compromise, rather than in the total abandonment of the traditional culture and language.

2.8 ATTITUDES TO LANGUAGE DEVELOPMENT

Everyone we spoke to was in favour of language development work being done in the vernacular languages. The reasons are as follows:

1. A fear that the languages will die out if they are not written down.
2. There are many stories, traditions and skills which are worth preserving.
3. People in rural areas prefer to use the vernacular. For example, boys would prefer to have a handbook for an outboard motor written in the vernacular, rather than in Pidgin.
4. Pidgin is not adequate or fully understood by all.
5. Those who leave Manus would use books to maintain knowledge of the vernacular.
6. Christians would like to have Scriptures in the vernacular.

3. LINGUISTIC OBSERVATIONS

The purpose in collecting linguistic data was to obtain a general overview of the linguistic situation in Manus, using Healey (1976) as a starting point. There was neither the time nor the opportunity to go into too great detail. However, an attempt was made to verify the information presented by Healey and to isolate the areas of difficulty which require further investigation. The groupings which we have proposed were made on the basis of the opinions of the local inhabitants, and supported by an inspection of the wordlists which we collected.

3.1 HISTORICAL AND CONTACT FACTORS

The complexity of the linguistic situation on Manus militates against a straightforward categorisation of the various languages into families. This is probably due to the influence of two distinct factors, which we have called the 'historical' and 'contact' factors.

Historically, it is probable that most, if not all, of the languages derive from the same source. In some cases the historical connection can still be remembered, for example the island of Bipi was colonised by migrants from Loniu, and the two languages still have a relatively high cognate percentage. More recently, Bowat 2 (Koro) was settled by other people from Los Negros, probably Papitalai, and these two languages are 83% cognate. As would be expected, geographic isolation has led to the divergence of what was originally one language.

However, this process has been made more complex by convergence due to contact in the intervening period between the time of the migration of the original settlers and today. Taking the above example again: Bipi has far more in common with its neighbour Lindrou (36% cognate), than the two widely separated groups Loniu and Lindrou (only 21% cognate). This suggests that despite the difference that there probably was when Bipi was first settled, the two languages have since been converging due to geographical proximity and trading links.

A similar observation can be made for the languages of Levei-Tulu, Pohuai and Mondropolon. Historically the dialects of Levei-Tulu as spoken at Pujou in the south and at Tulu in the north are reputed to have been members of a single language. However, since the dispersion of the original speakers of this language, these two dialects have diverged to the extent that they are now only 36% cognate. By contrast, along the north coast there has been convergence between neighbouring languages such that Tulu is now 65% cognate with Pohuai and 54% cognate with Mondropolon.

Contact, or lack of it, is probably the factor which has made the difference. On the north coast, the settlements are closer together, there is relatively good access by land, and there is constant movement by canoe. This has made possible regular interaction between the speakers of these three languages, which in turn has promoted or maintained a relatively high level of linguistic similarity between the languages. On the south coast, however, there are much fewer people and Pujou in particular is almost completely cut off from its nearest neighbours by mountains, mangrove swamps and large river systems. This lack of contact with other speakers of the same original language, as well as speakers of other languages has undoubtedly contributed to its linguistic distinctiveness. Conversely, in other parts of the south coast where there has been contact between speakers of different languages, there has been convergence as in the case of the village of Loi. Originally the people of this village spoke Bohuai, but when the village was relocated in the Ere area, the people began to learn and speak Ere.

It appears then, that we are faced with an example of language chaining, especially on the north coast. That is, the present day linguistic relationships of the Manus languages are not just due to the straightforward process of natural divergence due to the passage of time, but in addition, where language communities have been in regular contact, closer relationships between their languages have been maintained or re-built.

3.2 CHARTS AND DIAGRAMS

The cognate percentages displayed in Chart 1 are based on a phonetic comparison of 100 words extracted from standard SIL wordlists. Two sets of data were obtained for Lele, Levei-Tulu, Koro and Penchal in order to give some indication of the variation that is possible within one language due to geographic distance, word taboo and individual idiolects.

The purpose of this stage of investigation is only to give a general impression of the linguistic relationships between the languages represented. It is recognised that more detailed phonological analysis and comparison still needs to be done in order to obtain a more definitive understanding of the complexities of the relationships that exist between the languages of Manus.

3.3 FURTHER COMMENTS

The notes which follow include comments on Healey's analysis, and on areas requiring further investigation:

1. Okro, Nane, and E.

We visited the relevant areas but found no trace of these languages which are cited by Healey.

Okro: The people of Warembu speak Lele, and *okero* is Lele for 'this is it', or 'that's all'.

Nane: The people in Loi formerly spoke Bohuai and now speak Ere: the people in Patu area speak Bohuai and Lala does not appear to exist. *Nane* is a word in the Bohuai language used in the context of meeting for a discussion.

E: The people of Peli Island have moved to Pelipohuai and speak Bohuai.

2. Likum.

It appears that Likum (otherwise known as Malai) a distinct language. However, we were informed that most people of Likum now speak Lindrou. Likum is reported to be very different from other Manus languages.

3. Levei-Tulu.

Due to rough weather, we were not able to visit this area, although we did obtain wordlists from Tulu and Pujou. From the information we have, this seems to be quite a complex area and needs further investigation. Originally these people were isolated and lived inland, probably speaking a single language. At some time in the early colonial period, they moved to the coast, some going to the north and some to the south. The resulting geographic isolation, and proximity to different languages (Pujou to Likum/Lindrou, Levei to Sori, and Tulu to Bohuai and Mondropolon) has stimulated a rapid process of linguistic divergence. This language is also known as Keli.

In addition, our Tulu assistant felt that the people of Drehet spoke a language which was different from both Levei and Tulu, but we had no opportunity to verify this.

4. The Islands.

Healey assigns the northern group of islands (Leipon, Andra, Ponam etc.) to one family, and languages in the south eastern group (Lou/Baluan, Penchal, Lenkau etc.) to another. Historically it may well be that they have a close relationship but it does not appear to be particularly striking according to our figures. Lou and Pam/Baluan which Healey treats as one language, are only 59% cognate; and Penchal and Lenkau, which are geographically adjacent,

are only 30% cognate. In addition the island languages often have as much in common with neighbouring languages on the mainland as they do with neighbouring island languages. This is not surprising, seeing that the traditional trading links (which still continue today) were between the islands and the mainland, rather than between the islands themselves.

5. Titan

We were told that Titan was the original language of Manus, from which all the other languages were derived. Be that as it may, at the present time Titan has no clearcut or close relationship with any other language. Its closest relationship is with Nali (25% cognate) and Papitalai (33% cognate). The people who speak Titan are sea-going people and have settled in many widely spread areas along the coast and on the islands in the south-east part of Manus. It would be reasonable to assume, therefore, that there will be several dialectal differences within the main grouping called Titan. This would need to be investigated further.

6. Kurti and Elu

According to our information, Elu is spoken in the vicinity of Lowa and is closely related to Kurti. This differs from Healey who links Elu with Lele, even though he assigns Lowa to the Kurti area. This needs further investigation.

7. Koro and Lele

The language spoken in the vicinity of Bowat 2 (nambis) should be differentiated from Lele. It is known as Koro, as is the language spoken at Papitalai. Our data shows that these two languages are, in fact, quite closely related (83% cognate), whereas Koro and Lele are only 62% cognate. This is substantiated by the fact that Bowat 2 was settled by migrants from Los Negros. (Our informant, who comes from Loni, actually said that the migrants left from Loni, but they may just as well have gone from Papitalai.)

Within Lele itself, there are still dialectal differences; for example, the Lele spoken at Warembai is not exactly the same as that spoken at Tingo.

8. Kaniet and Hermit

It is reported that the Kaniet Islands are no longer inhabited and that the Kaniet language is extinct. Hermit is reportedly spoken by some older people on Luf Island in the Hermit Group but the younger generation speaks Seimat.

9. Intelligibility

As far as a language development program is concerned, mutual intelligibility between different languages is a factor of crucial importance, which needs to be taken into account. It should be noted that the sets of relationships which we have proposed are based on fairly superficial cognate counts, coupled with the subjective impressions of the local inhabitants. It would be extremely useful, therefore, to actually test intelligibility in one or more areas of Manus and see how the scores correlate with the figures presented in this report.

3.4 BRIEF GRAMMATICAL NOTES

Needless to say, this is not a comprehensive and definitive study of this subject. The purpose of this section is to provide an indication of the general characteristics of the Manus languages, which can serve as a basis for further studies.

1. Characteristic consonants:

<i>p</i>	<i>t</i>	<i>k</i>	<i>ʔ</i>
<i>mb</i>	<i>nd</i>		
<i>m</i>	<i>n</i>		
	<i>s</i>		<i>h</i>
		<i>tʃdʒ</i>	
	<i>l</i>		
	<i>r</i>		
<i>w</i>		<i>j</i>	

2. Unusual consonants:

Ponam has [f] although this could be an allophone of /P/.

Bipi has [X], a voiceless uvular fricative.

Lou and Baluan have [B], a voiced bilabial fricative.

3. Notes on the consonants.

The most notable characteristic is that there appears to be no contrast between voiced and voiceless stops. The phonetic description of the stops on the majority of occasions would be 'voiceless unaspirated'. However, because there is no contrast, there is a tendency towards free variation. In Lindrou, for example, the stops are consistently voiced, but there is still no voiced/voiceless contrast. In other languages, medial stops are also produced with slight voicing. Some of the earlier linguists, (e.g. Smythe) and the translator of the Lele N.T., indicated that the stops were voiced, viz: *b, d, g*.

4. Characteristic vowels

<i>i</i>		<i>u</i>
<i>e</i>	<i>a</i>	<i>o</i>

Note that /e/ is the half-open variety of front spread vowels and that /o/ is the half-open variety of rounded back vowels.

5. Unusual vowels

Penchal has both an /i/, a mid, close, spread vowel, and an /ø/, a front, half-close, rounded vowel, in addition to the other vowels.

6. Notes on the vowels

Note that:

1. Some of the languages have length, for example Kurti and Mondropolon.
2. Some languages have voiceless vowels, for example Pak.
3. Some languages have diphthongs.

APPENDIX A.

THE SOCIOLINGUISTIC QUESTIONNAIRE

It would certainly be useful to have a pre-prepared printed questionnaire available for this kind of survey work. It is much easier to handle from a researcher's point of view, and it would ensure that the same questions are consistently put to all the interviewees.

The aim of the survey reported above was to identify trends in language usage and attitudes to language; no attempt was made to quantify the various responses, or to identify the factors which had the most effect on the linguistic situation. Before a definitive questionnaire is drawn up, a decision would have to be made regarding how much detail is required in terms of data and analysis of the data. If more detail is required, the relevant chapters in Loving and Simons (1977) should be taken into account.

On the basis of our experience in using this Preliminary Sociolinguistic Information Checklist, we would make the following recommendations:

1. Divide the questionnaire into two distinct sections:
 - (a) Questions regarding the whole language group or region, which need only be asked once. This would cover topics like: marriage/trade relationships, migration patterns, language name(s), village names, use of language in church, market, school, courts etc. It would, of course, be wise to double check this information with more than one informant, but there would be no need to write it out half a dozen times. This section could also be used with groups of people, thereby obtaining a consensus.
 - (b) Questions which need to be put to each individual interviewee. This would cover topics like: mother tongue, bilingualism, language of parents, language used in home, place of birth, place(s) of residence, education, language use and occupation of siblings or children, attitude to different languages, attitude to literacy/translation in vernacular.
2. Take pains not to influence the informants' response to the various questions:
 - (a) Avoid Yes/No questions where possible, for example, use 'Which language is used in church services?', Not 'Does the pastor use Pidgin in church services?'
 - (b) Offer real choices, for example, 'If you could have a handbook for an outboard motor/New Testament (etc.) in only one of these languages, English, Pidgin, vernacular, which would you choose?'; 'Which languages would you like your children to learn to speak?' and 'Why?' and so on.

PRELIMINARY SOCIOLINGUISTIC INFORMATION CHECKLIST – MANUS/ADMIRALTY ISLANDS

0. INTRODUCTION

The following list of categories and items, while not exhaustive, covers the basic communication network that must be considered in any long-range language program. For the most part, questions should be designed for each category in the checklist after careful discussion with the language speakers and leaders in the area. For example, the category 'Language acceptability' in 6.9 is put there to remind us that just because people speak or understand another language, it does not follow that printed materials in the other language will be acceptable. It is difficult, however, to frame

questions that do not bias the answer and even indirect questions, coupled with observations, will need to be applied to a variety of speakers and situations.

The checklist is, therefore, only a basic framework for outlining subsequent questions for this preliminary survey and a more detailed subsequent survey.

The crucial category is 7.5, on 'forecasting'. We need to evaluate the historical trends, the present climate toward the languages, and make some predictions on what will happen if such trends continue, or how trends can be reversed, if this is realistic and acceptable.

The present outline assumes that researchers are familiar with basic linguistic and sociolinguistic survey techniques as outlined in, for example, Loving and Simons (1977).

1. GENERAL INFORMATION (G)
 - 1.1 Name of person supplying information
 - 1.2 Name of village (official spelling and local):
 - 1.3 Name of dialect/language (official and local):
 - 1.4 Language family/group (academic and local):
 - 1.41 Correlation of language and social group:
 - 1.5 Other comments (alternative names, contacts, references, etc.):
2. LANGUAGE/CULTURAL RELATIONSHIPS (L-C)
 - 2.1 Multilingual in what vernaculars:
 - 2.11 Subgroup according to age (child, adolescent, young adult, young married, older) and sex:
 - 2.12 Samples from minority village areas:
 - 2.2 Passive bilingualism in what vernaculars:
 - 2.21 (See 2.11)
 - 2.3 Migration patterns of present group:
 - 2.31 (See 2.6)
 - 2.4 Trade alliances or patterns:
 - 2.41 (See 2.6)
 - 2.5 Marriage patterns:
 - 2.6 If patterns have changed/are changing, effect on multilingualism:
 - 2.7 Short wordlist:
 - 2.8 Pronominal set(s):
 - 2.9 Comments on phonology, pronunciations:
 - 2.10 Standard vs. taboo vocabulary:
3. COMMENTS ON DEMOGRAPHY AND ECOLOGY (D-E)
 - 3.1 Size of community:
 - 3.11 Churches, markets, stores, schools, etc.:
 - 3.2 Absenteeism (where, what percentage):
 - 3.21 Long term/short term:
 - 3.3 Geographical setting:
 - 3.31 Ease of access
 - 3.4 Principal foods:
 - 3.41 Traditional:

- 3.42 Introduced:
- 3.5 Cash crops:
- 4. EDUCATIONAL SITUATION (E)
 - 4.1 Standard of available education (include non-formal):
 - 4.2 Administer ERU-SIL questionnaire:
 - 4.3 Radio Manus listeners and comments:
 - 4.31 Languages used for songs:
 - 4.32 Songs most frequently played:
- 5. SOCIAL AND RELIGIOUS SITUATION (S-R)
 - 5.1 Leadership structure:
 - 5.2 Type and size of Christian communities:
 - 5.3 Language used in church(es):
 - 5.4 Council structure:
 - 5.5 Cooperatives/other community groups:
- 6. LANGUAGE ATTITUDES (A)
 - 6.1 Attitude to vernacular:
 - 6.11 Government, Church, Provincial leaders:
 - 6.2 Attitude to Pidgin:
 - 6.21 (See 6.11)
 - 6.3 Attitude to English:
 - 6.31 (See 6.11)
 - 6.4 Best second vernacular: Why?
 - 6.5 Easy to read/write vernacular:
 - 6.6 Attitude to vernacular literacy materials:
 - 6.7 Attitude to vernacular Scriptures:
 - 6.8 Attitudes to various parameters of language uses:
 - 6.81 Formal/informal:
 - 6.82 Stranger/non-stranger:
 - 6.83 Religious/home/school:
 - 6.84 Traditional (trade)/government:
 - 6.85 Joking, parties/ceremonies:
 - 6.86 Official business/informal contact:
 - 6.87 Economic life (shops, markets, trade, etc.):
 - 6.88 Courts (interpretation):
 - 6.89 School (classroom vs. play):
 - 6.90 Hymns/sermons/Bible readings:
- 6.9 Language acceptability:
- 7. LANGUAGE PLANNING (P)
 - 7.1 Factors relating to social change (school leavers, cash economy, Westernisation, etc.):
 - 7.2 Literary and educational history:
 - 7.3 Political and economic situation:
 - 7.4 Expectations (what are goals, aspirations):
 - 7.41 All children become bilingual in Pidgin:
 - 7.42 Pidgin vocabulary replaces vernacular:

- 7.43 Vernacular materials:
- 7.44 Community, government, and church support:
- 7.5 Forecasting:
 - 7.51 The role of vernaculars:
 - 7.52 The role of Pidgin:
 - 7.53 The role of English:
 - 7.54 The role of SIL research:
 - 7.55 The role of SIL literacy:
 - 7.56 The role of SIL translation:

RESOURCES CONSULTED FOR THE QUESTIONNAIRE

AUSTRALIAN ABORIGINES BRANCH

- 1973 Types of translation programs. Mimeo.
rev.
- 1979

BENDOR-SAMUEL, John

- 1976 Language use and language policies. British SIL Lectures. Mimeo.

BENDOR-SAMUEL, Pam

- 1978 Suggested format for summary information sheet of Displaced Language Project material.

BROOKS, Bonnie, et al.

- 1972 Sociolinguistic background questionnaire: a measurement instrument for the study of bilingualism. The University of Texas at El Paso (For English-Spanish area). Mimeo.

BUSENITZ, Robert and Michael MARTENS

- 1979 Considerations for language identification surveys. *Notes on Linguistics* 10:10-27. SIL. (Outlines four stages in surveys, following preliminary research: a preliminary survey, word list surveys, dialect intelligibility surveys, and sociolinguistic surveys. Includes a good beginning bibliography.)

DAVIS, Irvine

- n.d. Ethnographic questionnaire to aid in evaluating translation needs. North American Branch SIL.

HEADLANG, Thomas N.

- 1977 Interviewing: A method of ethnographic research. Technical Memo #52, Philippines Branch SIL.
(Seven interview schedules: genealogy, demography, death census, belief system, cultural values, second on demography, and acculturation effect.)

APPENDIX B.

A CHECKLIST OF THE VILLAGES AND ISLANDS OF THE ADMIRALTY ISLANDS

1. INTRODUCTION

The source materials for this checklist come from:

1. Alan Healey, Austronesian Languages, Admiralty Islands Area, in *Pacific Linguistics*, Series C, No.39, vol.2. Healey's article was used as a starting point; this information was then checked and amended as necessary, on the basis of our own investigations;
2. *The Village Directory 1973*, Department of Development Administration, Port Moresby, compared with the 1964 edition, and the preliminary round of the 1980 Census administered in November 1979;
3. Maps produced by the Lands Department of Port Moresby in 1957 (L.D. 1957). Available in the SIL Library at Ukarumpa;
4. A more recent map from the Lands Department entitled: S.A. Guinea, 1 : 250,000, Admiralty Islands East, Edition 1-AAS. This map should be referred to for detailed information regarding language boundaries, and location of villages;
5. Personal research, January – February 1980.

2. THE CHECKLIST

The categories in the Village/Island Index should be noted as follows:

(a) Column 1, Village Names

In general we have followed the spelling used in *The Village Directory*. Variations in spelling are given in parentheses, and alternative names are cross-referenced.

Note the following difficulties which regularly occur:

p/b: in the Manus languages there is no distinction between *p* and *b*.

In strict phonetic terms, unaspirated [*p*] occurs more frequently than [*b*]. However, other linguists and census administrators have often written names with a *b* rather than a *p*. Note the variations of *mb/b* and *nd/d*, such that some names commencing with an *mb* or an *nd*, are sometimes written simply with a 'b' or a 'd'.

(b) Column 2, Language Names

To save unnecessary confusion we have retained the format of the name used by Healey for most of the languages, even though in some cases we disagree with the grouping and relationship implied by the name. Where the disagreement is clearcut we have amended Healey's usage in line with our findings.

Following Healey, we have used these conventions:

1. Names in parentheses indicate members of a particular grouping of languages. (It is these divisions which we feel are particularly dubious.)
2. Hyphenated names indicate one language with one or more dialects.

3. Slash marks indicate a single language spoken in different locations.
4. 'Mixed' refers to plantation settlements, mission stations etc., where people from different language groups live in the same community.

For a full discussion of the areas where our data conflicts with Healey's presentation, see section 3.3 of this report.

(c) Column 3, References to *The Village Directory 1973*.

The abbreviations refer to the Census Divisions as follows:

1. L.S.1 : Lorengau-Sou 1;
2. B.M.2 : Baluan-M'bunai 2;
3. S.B.3 : Sou-Bipi 3.

All of these are on pages 236-239.

4. E.S; W; W.I. : East Sepik; Wewak; Western Isles, on page 205.
5. 1964 ed. : indicates that the village appears in the 1964 edition but not the 1973 edition. Where there is no reference, the village concerned does not appear in any of the Directories.

(d) Column 4, Locations.

This column should be read in conjunction with the 1 : 250,000 map.

'No location' indicates that, although the village exists, we have not been able to pinpoint it on the map.

'L.D.1957' refers to the Lands Department Map of 1957 as the source for the location.

It was not possible to include all the village names on the map appended to this survey report.

VILLAGE/ISLAND	LANGUAGE	<i>THE VILLAGE DIRECTORY REFERENCE</i>	LOCATION
Ahus – alternative name for Hus Is. Alukuk – original name for Johan 1. Andra Is.	Andra-Hus	L.S.1	off N coast, W end of Seadler Harbour
Anchorite Is. – same as Kaniet Is. Apubai – original name for Johan 2. Aran	Mondropolon	S.B.3	N coast, central, opp. Ponam Is.
Aua Is. (Auna)	Wuvulu-Aua	E.S. W; W.I.	Western Islands
Badlock	Ere (Kuruti-Pare)	L.S.1	N coast, inland opposite Andra Is.
Baluan Is. Banum – Healey:	Baluan-Lou-Pam Levei-Tulu	B.M.2 ...	SSE of Manus No record – possibly confusion of Ponam
Bipi Is. Bohuai 1	Sisi/Bipi Bohuai	S.B.3 B.M.2	off W coast south coast central, SW of Mt Filiam
Bohuai 2 Bowat 1 (bus)	Bohuai Ere (Lele)	B.M.2 L.S.1	SW of Mt Filiam N inland, south of Tingau River
Bowat 2 (nambis) Buiat	Koro Baluan-Lou-Pam	L.S.1 B.M.2	N coast, W of Lorengau Pam Is.
Bulihan Bulihat	Nali Ere (Lele)	L.S.1 L.S.1	E inland, S of Lauis River NE, close to Lorengau (W)
Bumbanin (Bumbamin, Bumpalin) Bunai – alternative form of M'bunai	Baluan	B.M.2	Baluan Is.
Bundrahei Bundralis	Lindrou mixed	S.B.3 ...	SW coast, Malai Bay Catholic Mission Station N coast central, opp. Ponam Is.
Bundrou Bursu	Titan Titan	L.S.1 ...	Rambutyo Is. (North) Rambutyo Is. no location
Butjou – alternative version of Pujou Buyang 1	Ere (Kele)	L.S.1	N Central inland, south of Derimbat
Buyang 2	Ere (Kele)	L.S.1	Further south, near source of Tingau River
Dariu – alternative name for Karon Derimbat	Ere (Kuruti-Pare)	L.S.1	N coast, SW of Hus Is.

Drabitou 1 (Ndrabitou)	Nali	B.M.2	S coast, inland of Patusi Bay
Drabitou 2	Ere	L.S.1	S coast, inland of Patusi Bay
Drabwi – alternative name for Patu			
Dramdru – alternative (older) form of Londru			
Drano – alternative form of N'drano			
Drehet (Ndrehet)	Levei-Tulu	S.B.3	NW coast, E of Nares Harbour
Drelap (Delap) – alternative forms for Ndrelap			
Droia	Ere (Kele)	B.M.2	S coast, inland, near Wari River
Droli – alternative name for Kabuli			
Durour Is. – same as Aua Is.			
Hahai (Hahei)	Pak/Tong	B.M.2	Pak Is.
Harengan Is.	Sori-Harengan	S.B.3	off W coast
Hatwara	Ere and Nali	...	SE inland, between Pau and Drabitou
Hauwai Is. (Hauwei)	Leipon	L.S.1	N of Lorengau
Hermit Is.	Hermit	W.I.4	Western Islands
Horan	Koro	L.S.1	NE coast near Powat 2
Hus Is. (Ahus)	Andra-Hus	L.S.1	NW of Lorengau
Inrim – plantation only; Malabang is village			
Iruru – alternative form of Riu Riu			
Jowan 1 (Johan)	Lindrou	S.B.3	NW coast, islands in Seichte Bay
Jowan 2 (Johan)	Lindrou	S.B.3	NW coast, islands in Seichte Bay
Kabuli	Lindrou	S.B.3	SW coast – NW arm of Malai Bay
Kali Is.	Lindrou	S.B.3	W coast Is. in Kali Bay
Kaniet Is.	Kaniet	...	Western Islands
Kapou (Kapo, Kapor)	Nali	L.S.1	SE inland
Kareng	Elu	...	part of Lowa
Kari – alternative name for Badlok			
Karon	Nali	L.S.1	SE inland, S of Luis River
Katin	Nali	...	SE inland, S of Luis River
Kawaliap	Ere (Kele)	...	near Buyang
Kogo – name of a mountain			SW coast, W arm of Malai Bay
Kokou – same as Leihuwa			
Korrojih – alternative name for Kabuli			
Koru	Ere (Kuruti-Pare)	L.S.1	N coast central, part of Sou

Koruniat	Ere (Kele)	L.S.1	Island NE of Lorengau, outer edge of Seadler Harbour
Kulep (Kuluo)	Penchal	B.M.2	Rambutyo Is.
Kup	Ere (Kuruti-Pare)	...	Part of Sou
Kupano	Bohuai	B.M.2	S coast central, W of Patu
Labahan (Labakan)	Koro	L.S.1	N coast, W of Powat 2
Lago (Lakou)	Baluan-Lou-Pam	B.M.2	Lou Is.
Lahan (Lohan)	Nali	B.M.2	SE coast, E Patusi Bay
Lala – Healey:	Nane – both this village and language are unknown		
Langendrowa – plantation,	S. Rambutyo; village name: Mouklen		
Laues (Lawes, Luis)	Nali	B.M.2	E coast, mouth of Luis River
Lehewa – same as Leihuwa			
Leihuwa (Leihwa; Leiwa)	Mondropolon	S.B.3	N coast, SE of Ponam Is.
Lenkau	Lenkau	B.M.2	SW Rambutyo Is.
Lessau	Lindrou	S.B.3	W coast (N)
Levei	Levei-Tulu	S.B.3	NW coast, Nares Harbour
Liap	Ere (Kuruti-Pare)	L.S.1	N coast, SW of Hus Is.
Likum	Lindrou	S.B.3	SW coast, W Malai Bay
Lindrou – regional name			
Lipan	Baluan-Lou-Pam	B.M.2	Baluan Is.
Liuliu	Titan	B.M.2	N Rambutyo Is.
Loamat	Titan	B.M.2	N Rambutyo Is.
Lohe (Lohi) – alternative forms of Loi			
	– Loi was formerly in the Pohuai area. It has moved location into the Ere area, and now the people are speaking Ere.		
Loi	Ere and Pohuai	B.M.2	see above
Loitcha (Loisa)	Titan	B.M.2	SE coast, W Patusi Bay
Lolak	Loniui	L.S.1	two miles E of Loniui
Lolo – on Pityilu island			
Loemoi (Lomei; Lamo)	Ere (Kuruti-Pare)	L.S.1	N coast, part of Sou
Lonal	Mixed: Kele/ Kurti/Lele	L.S.1	N coast inland from Bowat 2 – no exact location
Londru	Ere	1964 ed.	S coast, W Patusi Bay
Loniui	Loniui	L.S.1	S coast of Los Negros
Lou Is.	Baluan-Lou-Pam	B.M.2	SE Is. N of Baluan Is.
Lowa	Elu	L.S.1	N coast SSE of Hus Is.
Lowaia	Nali	B.M.2	SE coast, E of Patusi Bay
Lowakai – same as Tulu 2			
Luf Is – one of the Hermit islands			
Lundret	Ere (Lele)	L.S.1	NE inland, on highway, SE of Lorengau
Lugos	mixed	L.S.1	Mission, W of Lorengau

Malabang	mixed	L.S.1	plantation settlement N coast, NW of Lorengau
Malei	Nali	B.M.2	SW coast, E of Patusi Bay
Mandrelan – alternative name for Kupano			
Manuai	Baluan-Lou-Pam	B.M.2	Baluan Is.
Mara Yiri – same as Yiri			
Mariman	Elu	L.S.1	N coast, near Lowa
Maso (Masso)	Sisi/Bipi	S.B.3	Bipi Is.
Matahei	Sisi/Bipi	S.B.3	Bipi Is.
Matakau	Mondropolon	...	Bush village – abandoned
Maty Is. – see Wuvulu Is.			
M'buke Is.	Titan	B.M.2	due S of Manus
M'bunai	Titan	B.M.2	SE coast E of Patusi Bay
Metawari	Ere	B.M.2	SE inland; NW of Patusi Bay on Wari River
Metepong – alternative name for Pujou			
Mokera (Mokara)	Pak/Tong	B.M.2	Pak Is.
Mokerang (Mokareng, Mokerane)	Mokerang	L.S.1	NW coast of Los Negros
Momote	mixed	L.S.1	airport, Los Negros
Mouk Is.	Titan	B.M.2	NNE of Baluan Is.
Mouklen	Titan	B.M.2	S Rambutyo Is.
Mulierio (Muliro)	Pak/Tong	B.M.2	Pak Is.
Mundiburio	Ere (Kuruti-Pare)	L.S.1	N Coast, inland, SE of Sou
Mundrau	Ere (Kuruti-Pare)	L.S.1	N Coast, inland, SE of Sou
Naringel	Papitalai	L.S.1	S coast of Los Negros
Nauna Is.	Nauna	B.M.2	E of Rambutyo Island
Ndrabitou – alternative form of Drabitou			
Ndrano	Ere (Lele)	L.S.1	NW inland, between Tingau and Luis Rivers
Ndrehet – alternative form of Drehet			
Ndrelap (Ndelap)	Ere (Lele)	L.S.1	NE coast near Poluso
Ndrihol Is. (Ndriol)	Tital	...	N of Rambutyo Is.
Ndrilo Is. (N'dilou)	Leipon	L.S.1	NE of Lorengau
Ndroia – alternative name for Droia			
Ndrosun – same as Rossun			
Nihon Is.	Lindrou	S.B.3	off west coast in Kali Bay
Ninigo Islands	Seimat	W.I.4	Western Isles
Ngambouai	Baluan-Lou-Pam	B.M.2	Pam Is.
Nohang	Nali	B.M.2	S coast on Patusi Bay
Nyada	Lindrou	S.B.3	NW coast on Seichte Bay
Pak Is.	Pak/Tong	B.M.2	off E coast
Pam Is.	Baluan-Lou-Pam	...	N of Baluan Is.
Paniselu	Penchal	B.M.2	Rambutyo Is.
Papitalai	Papitalai	L.S.1	N coast of Los Negros

Parioi	Baluan-Lou-Pam	B.M.2	Baluan Is.
Patu	mixed	B.N.2	Catholic Mission Station S coast, W of Patusi Bay
Patusi	Titan	B.M.2	SE coast part of Pere
Pau	Ere	B.M.2	SE inland from centre of Patusi Bay
Paun	Baluan-Lou-Pam	B.M.2	Lou Is.
Peli Is.	Bohuai	...	S coast of central Pelikawa – now known as Pelipowai
Pelipowai	Bohuai	B.M.2	S coast central
Penchal	Penchal	B.M.2	Rambutyo Is.
Pere (Peri)	Titan	B.M.2	SE coast E of Patusi Bay
Perelik	Baluan-Lou-Pam	B.M.2	Baluan Is.
Piterait (Pitira'it)	Ere	B.M.2	SE inland NNW of Patusi
Pityilu Is.	Leipon	L.S.1	N of Lorengau
Poluso	Ere (Lele)	L.S.1	NE coast, W of Lorengau
Polendran	Penchal	...	Penchal area of Rambutyo
Pomassau	Titan	...	E coast, S of Lauis (L.D. 1957)
Ponam Is.	Ponam	S.B.3	off N coast, W end of Seeadler Harbour
Ponchal	Titan	B.M.2	SE coast, part of Pere
Pondeles	Ere (Lele)	L.S.1	NE coast, between Lorengau and Lugos
Popeu	Titan	B.M.2	Rambutyo Is.
Powat – alternative form of Bowat			
Pujou (Puju)	Levei-Tulu	S.B.3	SW coast, Malai Bay
Puluso	Ere (Lele)	...	N coast, W of Lugos
Pundru	Ere (Kuruti-Pare)	L.S.1	N inland; S of Andra-Hus
Rei	Baluan-Lou-Pam	B.M.2	Lou Is.
Riu Riu	mixed	L.S.1	plantation settlement on Los Negros
Rossun	Ere (Lele)	L.S.1	NE inland/SE of Lorengau on highway
Sabandruem – alternative name for Nyada			
Sabon 1	Ere (Lele)	L.S.1	NE inland, S of Lorengau
Sabon 2	Ere (Lele)	L.S.1	NE inland, S of Lorengau
Saha	Mondropolon	S.B.3	NW coast, SE of Ponam
Salami	mixed	L.S.1	Los Negros – plantation settlement
Salapai (Salapi)	Sisi/Bipi	S.B.3	Bipi Is., off W coast
Salasia (Salesia)	mixed	L.S.1	plantation, E of Lorengau
Salien	Lindrou	S.B.3	W coast; S of Kali bay
Sapondralis	Lindrou	S.B.3	SW coast; W of Malai Bay
Sau – alternative form for Sou			

Selalou – island on which Pere is located			SE coast
Sira (Sirra)	Nali	L.S.1	E inland; S of Lauis River
Sisi Is.	Sisi/Bipi	...	off W coast
Sohonilu (Sonilu, Sohneriu)	Nali	L.S.1	E inland; S of Lauis River
Solang	Baluan-Lou-Pam	B.M.2	Lou Is.
Soni (Soui)	Baluan-Lou-Pam	B.M.2	Baluan Is.
Sopa Sopa	Lindrou	...	plantation; peninsula on extreme NW coast
Sori Is.	Sori-Harengan	...	off NW coast; Nares Harbour
Sori 1	Sori-Harengan	S.B.3	NW coast, SSE of Sori Is.
Sori 2	Sori-Harengan	S.B.3	NW coast, SSE of Sori Is.
Sou (Sau)	Ere (Kuruti-Pare)	L.S.1	W coast central, S of Andra Is.
Supeu – electorate area only; no village; Kurti area			
Tandual	Pak/Tong	B.M.2	Pak Is.
Tau-Undrau	Ere	B.M.2 (Undrau)	SE inland; N of Patusi Bay
Tawi Is.	Titan	B.M.2 (Tawi)	off S coast, central
Tilianu Is.	Titan	B.M.2	one of San Migual Is. W of Rambutyo Is.
Timoenai (Timolenai)	Titan	...	S coast central; W of Tawi Is.
Tingau 1	Ere (Kele)	L.S.1	E central inland; N of Patusi Bay
Tingau 2	Ere (Kele)	L.S.1	E central inland; N of Patusi Bay
Tingou (Tingo)	Ere (Lele)	L.S.1	close to Lorengau
Tong Is.	Pak/Tong	B.M.2	off E coast
Tulu 1	Levei-Tulu	S.B.3	N coast; SSW of Ponam Is.
Tulu 2	Levei-Tulu	S.B.3	N coast; SSW of Ponam Is.
Waimundra	Ere (Kuruti-Pare)	L.S.1	N inland; S of Andra-Hus
Warambei (Warabei) – same as Warobi			
Warembu	Ere (Lele)	L.S.1	E inland; S of Lorengau on highway
Warobi	Ere (Lele)	L.S.1 (Warembu)	N inland; W of Lorengau
Warei (Worei) – regional name for Ere area			
Wuvulu Is. (Auna, Onei)	Wuvulu-Aua	E.S.; W; W.I.	to far W of Manus
Yiri (Mara Yiri) – alternative name/part of Tulu 1			
Yiringo	Ere (Lele)	L.S.1	N inland; SW of Lorengau on Tingau River
Yiriu (Yiru)	Nali	B.M.2	E coast (south)

APPENDIX C.

LANGUAGE INDEX

LANGUAGE	VILLAGE/ISLAND	LANGUAGE	VILLAGE/ISLAND
Andra-Hus	Andra Is.	Ere (Kele)(cont.)	Tingau 1
	Hus Is.		Tingau 2
Baluan	Bumbanin	Ere (Kuruti-Pare or Kurti)	Badlock
Baluan-Lou-Pam	Baluan Is.		Derimbat
	Buiat	Koru	
	Lago	Kup	
	Lipan	Liap	
	Lou Is.	Loemoi	
	Manuai	Mundiburio	
	Ngambousi	Mundrau	
	Pam Is.	Pundru	
	Parioi	Sou	
	Paun	Waimundra	
	Perelik	Ere (Lele)	Bowat 1 (bus)
	Rei		Bulihat
	Solang		Lundret
	Soni		Ndrano
			Ndrelap
Bohuai	Bohuai 1	Ndrosun	
	Bohuai 2	Poluso	
	Kupano	Pondeles	
	Peli Is.	Puluso	
	Pelipowai	Rossun	
Elu	Kareng	Sabon 1	
	Lowa	Sabon 2	
	Mariman	Tingou	
		Warembei	
Ere	Drabitou 2	Warembu	
	Lohe	Warobi	
	Londru	Yiringo	
	Metawari	Hermit	Hermit Is.
	Pau		Luf Is.
	Piterait		Kaniet Is.
	Taui-Undrau		Bowat 2 (nambis)
	Ere and Nali	Hatwara	Horen
Ere and Bohuai	Loi	Labahan	
Ere (Kele)	Buyang 1	Leipon	Hauwai Is.
	Buyang 2		Lolo
	Droia		Ndrilo Is.
	Kawaliap		Pityilu Is.
	Koruniat		

LANGUAGE	VILLAGE/ISLAND	LANGUAGE	VILLAGE/ISLAND
Lenkau	Lenkau	Nali (cont.)	Sohonilu Yiriu
Levei-Tulu (Keli)	Banum Drehet Levei Lowakai Mara Yiri Pujou Tulu 1 Tulu 2 Yiri	Nauna	Nauna Is.
		Pak/Tong	Hahai Mokera Mulireio Pak Is. Tandual Tong Is.
Lindrou	Bundrahei Jowan 1 Jowan 2 Kabuli Kali Is. Likum Nihon Is. Hyada Salien Sapondralis Sopa Sopa	Papitalai	Naringel Papitalai
		Penchal	Kulep Paniselu Penchal Polendran
		Ponam	Ponam Is.
		Seimat	Hermit Is. Ninigo Is.
		Sisi/Bipi	Bipi Is. Maso Matahei Salapai Sisi Is.
Loniu	Lolak Loniu		
Mokerang	Mokerang		
Mondropolon	Aran Kokou Lehewa Leihuwa Matakau Saha	Sori-Harengan	Harengan Is. Sori Is. Sori 1 Sori 2
		Titan	Bundrou Bursu Langendrowa Plantation Liuliu Loamat Loitche M'buke Is. M'bunai Mouk Is. Mouklen Ndrihol Is. Patusi Pere Pomassau
Nali	Bulihan Drabitou 1 Kapou Karon Katin Lahan Laues Lowaia Malei Nohang Sira		

LANGUAGE	VILLAGE/ISLAND	LANGUAGE	VILLAGE/ISLAND
Titan (cont.)	Ponchal	Wuvulu-Aua	Aua Is.
	Popeu		Durour Is.
	Selalou		Maty Is.
	Tawi Is.		Wuvulu Is.
	Tilianu Is.		
	Timoensi		

APPENDIX D.

PUBLISHED MATERIALS IN MANUS VERNACULARS

1. *Lele New Testament*. In 1956 The British and Foreign Bible Society published a New Testament in Lele, as spoken at Tingo near Lorengau, which had been translated by a member of the Manus Evangelical Mission. When the mission first started working in Manus, it adopted this language as the official church language. The intention was that members of other language groups would learn this language and thereby benefit from the educational and other services offered by the church. This system worked for a while, but was never an ideal situation, and with the advent of Pidgin, the policy was abandoned.

Unfortunately, even the Lele speakers do not now use this translation. When investigating the reasons for this, we received some rather contradictory answers. However, on balance it appears likely that the primary problem lies with the translation itself, more than anything else.

The original translation was done with the help of one or two people from Tingo and was not checked for comprehension by people from other areas. Silas Pokikau, pastor of the Evangelical Church in Lorengau, is of the opinion that a revision could and should be made, drawing on representatives from all parts of the Lele area. He thinks that a vernacular which was easy to read and understand, would be far superior to the Pidgin.

There is a copy of this New Testament in the SIL library at Ukarumpa.

2. *Song books*. Song books have been produced at various times in Lele, Lindrou and Mondropolon. These are not usually used in church services, but people still request them on occasions of community hymn singing.

3. *Other projects*.

- (a) Some of the early Catholic fathers did a considerable amount of linguistic research, some of which may still be at the Papitalai Station.
- (b) Students at the Christian Leaders' Training College (Banz, W.H.P.) have been encouraged to put a series of Bible stories onto cassette in their mother tongue, as part of their course. Silas Mana (Lele), currently working at Loniu, has done this, and there may be others.
- (c) Since this survey was completed several projects of language development and translation were initiated. As at the date of publication the project for Lindrou under the leadership of Timothy Kandrake, and the project for Nali under the leadership of Luke Pahur were still active.

NOTES

1. We wish to acknowledge the following: Dr Karl Franklin (SIL), for his sympathetic direction of this project, as well as the final editing of this paper; Mr Cholai Polume (BTA), for his advice and assistance in the initial organisation of the actual survey; Mr Barnabas Kambil (Premier of Manus Province), and members of the Provincial Government, for their enthusiastic encouragement and support; members of the Manus Evangelical Mission, and the Catholic Mission, for their warm hospitality and their help in arranging transport; the people of Manus who freely gave of their time to answer questions and provide data for this survey; and also for their spontaneous hospitality and generosity, and Bill Martin for his help in compiling the map.
2. The material from this section may need updating in terms of certain figures. It is from E. Ford, ed. (1974).
3. As indicated in the title, the present study is preliminary to a continuing study of the Manus Province linguistic and sociolinguistic picture.
4. A cognate percentage was also computed between English and German, using the same method. Comparison with this figure (57%) suggests that the languages in Manus have diverged significantly in the course of their history.

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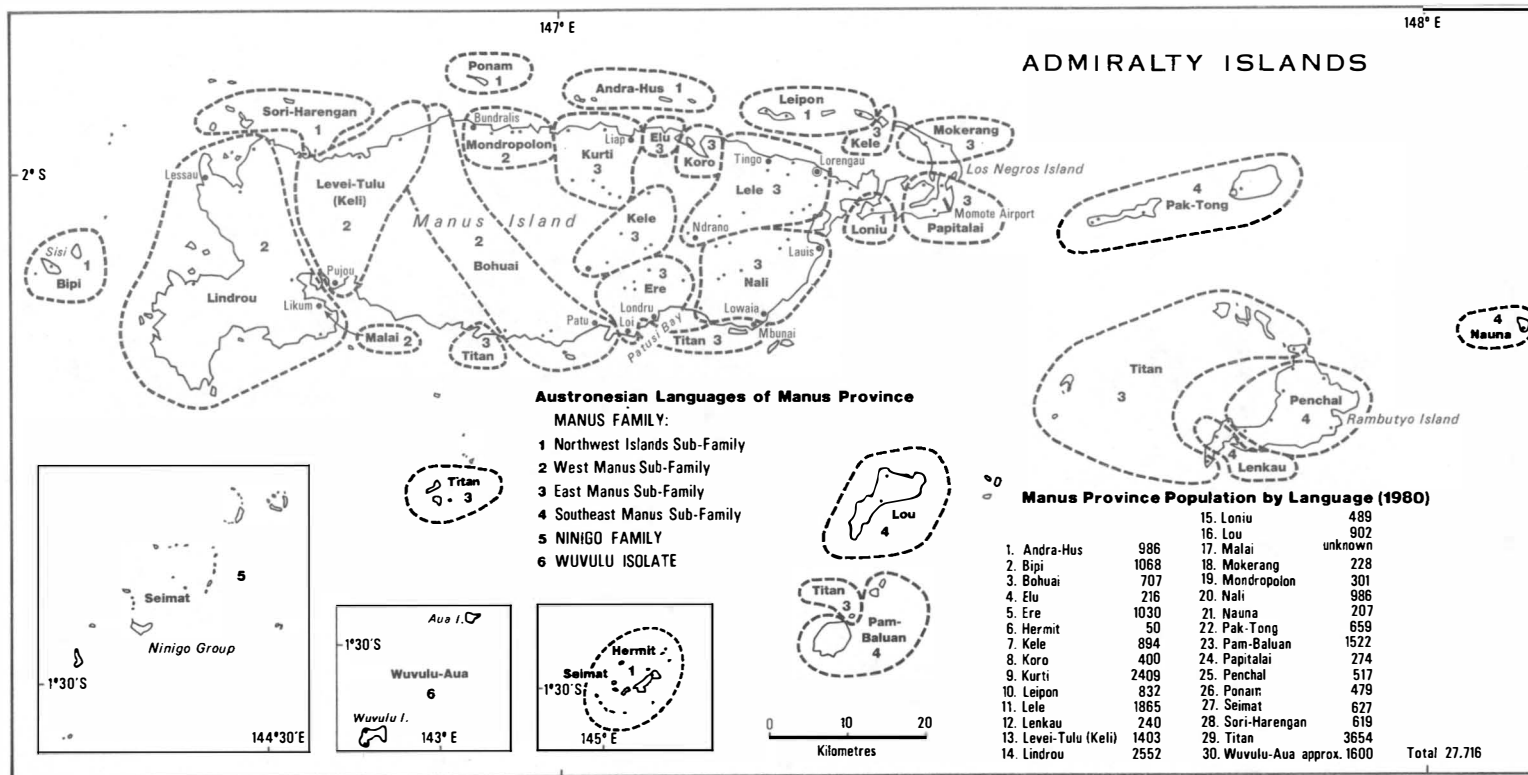
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SOME LANGUAGE AND SOCIOLINGUISTIC RELATIONSHIPS IN THE UPPER SEPIK REGION OF PAPUA NEW GUINEA

ROBERT CONRAD AND RON LEWIS

1. INTRODUCTION

Most of the languages in the Upper Sepik have been previously identified.¹ In May 1983 the authors conducted a sociolinguistic field survey² of some of the languages which were not discussed in previous work. These languages are located north of the Central Range of mountains, from the headwaters of the Leonhard Schultze and April Rivers to the Sepik River.

Since the people in this area frequently move over quite a large area, some groups no longer live near previously reported village sites.

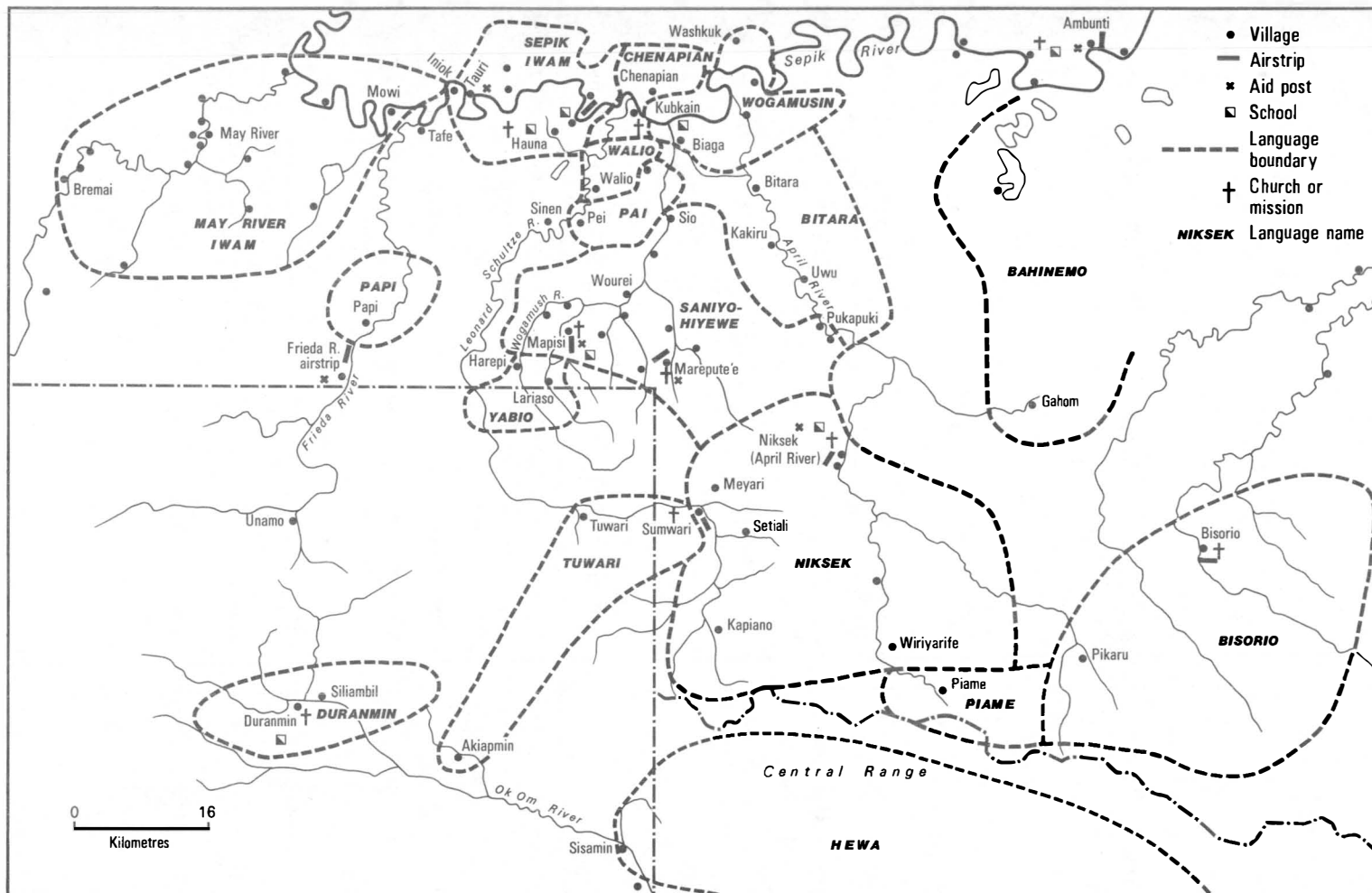
2. PROCEDURE

Lexical items were elicited according to a modification of the Summer Institute of Linguistics standard 190 word list. A number of items which Laycock (1970) and others³ have shown to be subject to rapid change were omitted along with a number of items difficult to elicit through Tok Pisin under survey conditions. The result was a 108 word list which was later reduced to 100 words by eliminating several that seemed to cause problems sufficient to skew the results.

An attempt was made to obtain two lists at each village wherever this was possible.

In addition, two sociolinguistic questionnaires from Bugenhagen (1981) were completed whenever it was possible to obtain the data in the time allotted. Samples of these questionnaires appear in Appendices 9.3 and 9.4.

Actual villages visited⁴ were Chenapian, Kubkain and Washkuk on the Sepik River; Walio, Pei and Sinen on the Leonhard Schultze River; the village of Niksek at Niksek (April River) airstrip; Sumwari, Piame, Sisimin, Siliambil (Duranmin), Papi on the Frieda River; and Lariaso, Mapisi, Marepute'e (Moropote airstrip) and Pakapuki. The word lists for Pikaru were taken at the village of Piame. The word list for Akiapmin was taken at Siliambil.



MAP 1: UPPER SEPIK REGION OF PAPUA NEW GUINEA (UPDATED TO SHOW THE SITUATION AS OF MAY, 1988)

The word lists were then carefully compared and the probable cognate decisions were made according to the following criterion. The recorded phonetic transcriptions were assumed to be approximately phonemic transcriptions as well. Then, with one symbol generally corresponding to one phoneme, the following criterion was used. If two forms have at least 50% of their phonemes identical or regularly corresponding and in the same linear order from left to right, then the two forms are coded as cognate. Otherwise the two forms are coded non-cognate.

Following the cognate decisions, the results were then entered into a computer which then determined cognate percentages between each elicited language variety. These percentages are given in Appendix 9.1, Figures 5 and 6.

3. INTERPRETATION

The lexicostatistic data have been interpreted using the assumption that it is often difficult to separate the effects of borrowing from those due to genetic relationship by comparison of the present languages (Conrad and Dye 1975). Thus, the same cognate percentage is considered more significant if it occurs between geographically distant groups than adjacent ones, since it indicates contact at a time prior to the groups living in their present location. The term ‘cognate’ here is taken to imply similarity in form and meaning, without implying necessary genetic relationship. The terms family, stock, and phylum are also used with the implication being either genetic relationship or old and continuing contact.

The sociolinguistic data have been interpreted keeping in mind the limitations (Bugenhagen 1981) of (1) the arbitrary nature of the social and situational categories, (2) subjective evaluation of degree of ability in a given language, and (3) a heavy reliance on reported data.

The interpretation of a given cognate percentage is also an interesting problem. Variation and error in word lists collected under field conditions with very brief periods of contact is of considerable importance in the interpretation of the data. As an effort to estimate some of the error involved, we used the ‘home town test’, in which at least two word lists were taken at the same village for Pikaru, Pei, and the Sumwari dialect of Niksek. The results are given in Figure 1.

LANGUAGE LISTS COMPARED	COGNATE PERCENTAGE
Pei 1 - Pei 2	94%
Pikaru 1 - Pikaru 2	74%
Sumwari 1 - Sumwari 2	91%
Sumwari 1 - Sumwari 2	88%
Sumwari 2 - Sumwari 3	91%

FIGURE 1: HOME TOWN TEST RESULTS

We attribute the relatively low percentage (74%) at Pikaru to the very difficult elicitation situation, which was essentially monolingual.

We assume that the communication situation within the same dialect of the same language, in the same village, is virtually perfect. That is, ideally the two lists should be 100%. From the data in Figure 1, we estimate that the observed cognate percentages derived from a field elicitation situation are approximately 10% lower than the actual percentages (cf. the average of the observed intra-village percentages for Pei and the Sumwari dialect of Niksek, which is 91%).

That is, the 91% would be converted to 100% by adding 10% of 91, or 9, to 91. In a monolingual situation such as Pikaru, the actual cognate percentage relationship must undoubtedly be considerably more than 10% higher than the observed relationship. Therefore the observed relationship for Pikaru (74%) was not used in estimating the error by the 'home town test'. In fact, Pikaru was a unique situation on this survey, in that it was the only completely monolingual situation encountered.

The error revealed by the home town test can be attributed to various problems such as: alternate words, alternate close synonyms, minor dialect variation, alternate grammatical forms for verbs or adjectives, lack of understanding of Tok Pisin, and inaccurate elicitation procedure leading to lack of precise communication between the vernacular speaker and the field investigator.

The word lists identified with subscripts 1 and 2 in Figures 6 and 7 refer to lists collected in different villages which are assumed to be variant dialects of the same language. The cognate percentages between these dialects of languages are extracted and given in Figure 2, with the exception of the dialects of Niksek, which are reported in Figure 3, Section 3. May River Iwam and Sepik Iwam could also have been included in this list, but are not because of additional contrary data given in Section 3.3.

VILLAGES COMPARED	PERCENTAGE OF PROBABLE COGNATES
Hewa 1 (Sisimin) - Hewa 2 (Morubunim)	71%
Sinen-Walio	66%
Tuwari 1 (Sumwari) - Tuwari 2 (Akiapmin)	47%
Wogamusin 1 (Kubkain) - Wogamusin 2 (Washkuk)	98%
Yabio 1 (Harepi) - Yabio 2 (Yanamo)	69%
Yabio 1 (Harepi) - Woswari	52%
Yabio 2 (Yanamo) - Woswari	57%

FIGURE 2: DIALECT COMPARISONS INVOLVING WORD LISTS FROM DIFFERENT VILLAGES

This wide variation requires some explanation, even after the suggested 10% home town correction has been added to each of these percentages. The high percentage for Kubkain and Washkuk probably reflects both a relatively slight dialect difference and a very good knowledge of Tok Pisin, which was used to elicit the lists.

We assume that the other percentage relationships in Figure 2 are lower because of greater actual dialect variation and the fact that Tok Pisin is not very well known in these areas.

The very low figure for Tuwari 1 and Tuwari 2 serves as an illustration of this assumption. There was only one man available for the list for Tuwari 2 (Akiapmin). His knowledge of Tok Pisin was

rather sketchy. In addition, he and the other residents of Akiapmin now live a considerable distance from the main group of Tuwari speakers, who now live at Sumwari. The two groups are separated by 35 to 40 miles of difficult terrain including the central range, and do not have frequent contact at present. They reported that the separation is relatively recent though. The small size of the Akiapmin group and its frequent contact with Duranmin speakers could also be factors resulting in the low percentage relationship observed. There was, however, virtually no evidence of increased borrowing from Duranmin in the Akiapmin word list itself.

The low percentages among the three dialects of Yabio (Harepi, Yanamo, and Woswari), going down to 52%, can be explained by two of the factors mentioned previously: lack of knowledge of Tok Pisin used in elicitation, and actual greater dialect differences than those between the Hewa and Wogamusin dialects in Figure 2.

Due to time limitations and the relatively large area involved in the survey, we were not able to collect a complete set of sociolinguistic data at every village. A reading test in Tok Pisin was done at Pei, where we received a list of the names of eight literates. The best reader could read quite well. For the majority of the areas visited off the Sepik River, the reading test and the sociolinguistic questionnaires were inappropriate because it was impossible to ask most of the questions. Tok Pisin was not known that well. At Sumwari, however, we were able to ask a few of the questions. At Niksek there were 40 Niksek speakers presently in a Tok Pisin school and also 38 children in an English school in standard 1. Fritz Urschitz estimates that in 1983 there were about 50 who could read Tok Pisin.

A second literacy test was given to a Wiriyarife speaker at Niksek. In this case the test involved writing a number of common Tok Pisin words in his vernacular. Without any orientation to the vernacular orthographical changes involved, he did remarkably well. In Marepute'e village a Hiyewe song book was given to a man literate in Tok Pisin and he was able to read it without difficulty.

4. LANGUAGES

4.1 LEONHARD SCHULTZE STOCK/FAMILY

The Leonhard Schultze sub-phylum (without Papi) was first suggested by Dye and Townsends (1969). A more complete account appeared in Laycock (1973), who reported a complex noun classification system in Walio, Pai, and probably Papi. The five languages listed in the Leonhard Schultze Stock/Family are Walio, Pai, Yabio, Tuwari, and Papi. The present report supplements and updates these earlier findings in the following way.

Due to the small and mobile populations in this area, some of the previously reported village sites have been changed considerably, as indicated in the map and in the following comments.

Pai is a language spoken by approximately 80 people, the majority of whom now live in the village of Pei, which is a resettlement area on a large hill (hummock) in the midst of a sago swamp. Pei consists of all the former residents of Pi No.1 and Pi No.2. Another group lives at Paru, on the tributary of the Wogamus River between Biaga and Sio. A number of people have died from illness, which probably accounts for the higher population figure of 208 given in Laycock (1973). The adult Pai male speakers know a trade language named Yahapiri by means of which they communicate with Walio speakers and also the Sepik Iwam speakers at Hauna. The younger generation knows Yahapiri to a very limited extent, and we predict it will die out and eventually be replaced by Tok Pisin.

Walio is a language spoken by approximately 200 people living in four hamlets on the lower Leonhard Schultze River: Walio, Sinen, Nein, and Osak.

Yabio is a language spoken by between 60 and 100 people who now live at Lariaso on the Hewe River and Harepi on the Miwe River, both of which are tributaries of the Wogamus. Some of the Yabio people formerly lived at Woswori, which is now deserted.

Tuwari is a language spoken by about 90 people who used to live at the village of Tuwari on the upper Leonhard Schultze River and in other areas to the south and south-west of Tuwari. At present they live at Sumwari, with the exception of a small group who live at Akiapmin on a tributary of the Ok Om River.

Papi is a language spoken by about 70 people, most of whom live at the village of Papi (Paupe). This village has shifted to a new location still on the Frieda River, two miles downstream from the Frieda River airstrip. A few Papi speakers also live in the small hamlet of Wasimai on the Leonhard Schultze River.

Duranmin (also occasionally called Wani) is a language spoken by 141 people living in two villages, Siliam and Siliambil, near the Duranmin airstrip. At this stage Duranmin is still classified as an isolate, with the highest shared cognate percentage being 6%, which it shares with Pai, Walio, Hewa, and three dialects of Niksek (Kapiano, Sumwari, and Wiriarife). Of the 26 languages compared with Duranmin, only three (Sepik River Iwam, May River Iwam, and Kakiru) showed less than 3% shared cognates. The remaining 23 languages under comparison showed between 3% and 6% probable cognates. Such differences are assumed to be insignificant, given the difficult elicitation conditions. In section 2 we have argued that every observed cognate percentage is at least 10% too low.

More significant is one observed suffix, *-pu ~ -po ~ -fo ~ -po* possibly meaning animate, which occurs with many animate nouns, adjectives and body parts in Pai, Walio, Yabio, as well as in Duranmin. It is probable that it also occurs in Tuwari as *-moi*.

4.2 SEPIK HILL STOCK/FAMILY

The Sepik Hill Stock/Family was documented first by Dye and Townsends (1969) and supplemented by Laycock (1973). Bruce (1979) reconstructed a subgrouping of Sepik Hill language by common sound changes⁵, Wurm (1982). Dye and Townsends originally posited 14 languages: Kaningra, Alamblak, Kapriman, Watakataui, Sumariup, Bisis, Mari, Bahinemo, Bitara, Sanio, Setiali, Gabiano, Umairof and Hewa. At that time a fifteenth language, Piame, was unknown but recognised as a possible member of the Sepik Hill Stock/Family. Laycock (1973) correctly joined Umairof to Hewa as a dialect and mentioned Pikaru as a possible additional Sepik Hill language. Wurm (1982) further refined the Sepik Hill Stock by positing three families: the Saniyo Family consisting of Saniyo, Paka, Gabiano, Piame, Pikaru, and Hewa; the Bahinemo Family consisting of Bitara, Bahinemo, Mari, Bisis, Watakataui, Kapriman, and Sumariup; and the Alamblak Family consisting of Kaningara and Alamblak.

The data from this present survey suggests the following further adjustments to the Sepik Hill Stock.

There is one language with approximately 300 speakers which we strongly suggest should be called Niksek. Niksek is the traditional name of the April River, which is relatively close to nearly all

the traditional living sites of this group. It is also the name of the airstrip where the majority of the people presently reside and have built houses, gardens, and are engaged in animal husbandry. This language has been designated by a number of different names in the literature: Paka, Setiali, Meiyari, and Gabiano. The last three are interpreted as dialects of one language according to our data, with observed cognate percentages ranging from 59 to 91 (actual percentages are estimated at 65 to 100). Gabiano is the most divergent with observed cognate percentages ranging from 59 to 68 with respect to the others. The complete list of observed probably cognate percentages in our data for the language we propose to call Niksek is shown in Figure 3.

Kapiano						
67	Sumwari 1					
68	91	Sumwari 2				
62	88	91	Sumwari 3			
59	77	82	80	Meiyari		
64	87	90	86	77	Setiali	
61	81	84	82	72	84	Wiriarife

FIGURE 3: DIALECTS OF NIKSEK

All these names are village names with the sole exception of Paka⁶, which is a derogatory name given to the Niksek people by Bahinemo speakers from the village of Gahom. The name Paka has strong negative connotations for the Niksek people. At the risk of future confusion and name proliferation, we feel the need to recommend strongly that the language name be changed to Niksek. The past movements of the Niksek people explain the origin of the name 'Paka'. The Niksek people originally lived in two different areas: near the present site of Wiriarife on a tributary of the Niksek (April) River and the general Sumwari area. Some of the Sumwari people later moved to a site downriver from the present Niksek (April River) airstrip and lived there for a few years, at which time they were given the name Paka by the Bahinemo people living at Gahom.

At present the Niksek people live in two main centres. About 200 live at Niksek where they have built houses and gardens and formed a new community along with the people who speak the Tuwari language. All the former residents of Setiali have moved to Sumwari or Niksek, and their old site is deserted. A very small number of Gabiano people remain at a village called Kabiano. A few also remain at Meiyari.

Piame is a language spoken by less than 100 people living in one village of the same name at the headwaters of the Niksek (April) River. It is a Sepik Hill language in the Saniyo Family, closely related to Niksek with cognate percentages varying from 44 to 53 for the various Niksek dialects.

Saniyo is a language spoken by about 700 speakers in two mutually intelligible dialects termed Saniyo and Hiyewe with extensive dialect chaining and 87% probable cognates between the extreme ends of the chain. Traditional settlement patterns in small swampland hamlets have been replaced by groups gathering in larger villages with the coming of several missions.

Pikaru (Bikaru, Bigalu) is the least-known language of the entire survey. Although Laycock suggests tentatively classifying it as a member of the Sepik Hill Stock/Family (1973:32), pending further data, our data suggests that Pikaru is a dialect of the Bisorio language, a language of the Enga

Sub-family of the West Central Family of the New Guinea Highlands Stock (Wurm 1982:125). Our evidence is as follows:

Pikaru (Bikaru) was first reported by Laycock (1973) on the basis of a patrol report 4/70-71 of Ambunti by L. Bragge. (This list appears in Figure 7, Appendix 9.2, under the column marked Bikaru (Bragge).) His Biame list also appears in this table. When compared to our data, Bikaru and Biame seem to be dialects of Piame, exhibiting cognate percentages of 29 and 33 respectively with Piame. Bragge's Bikaru list, however, shows only 22% cognate with our Pikaru 1. His Biame is also in a somewhat ambivalent position, since it is 33% cognate with our Piame and 25% cognate with Hewa 1. Bragge's Paka list is 47% cognate with Sumwari 1, indicating that it is most likely a dialect of Niksek.

Pikaru has a 9% observed probably cognate relationship with Piame, but 19% with Enga and 62% with Bisorio⁷. Pikaru's percentage of probable cognates with all other Sepik Hill languages compared in this survey (Hewa, Hiyewe, Niksek, Piame, Bahinemo, Bitara) are all low, ranging from 3% to 12%. This information all taken together indicates that Pikaru should be regarded as a dialect of Bisorio, a member of the Enga Sub-family of the West Central Family of the New Guinea Highlands Stock. Considering the monolingual elicitation situation for Pikaru, the true relationship with Bisorio is undoubtedly considerably closer than the observed 62%. Later information indicates the relationship may be above 90%.

4.3 UPPER SEPIK STOCK

The omission of the words 'Upper Sepik Super-Stock' and 'Upper Sepik Stock/Iwam Family' prior to the listing of the Iwam language in Laycock (1973:20) make the classification a little hard to follow, but the classification table on page 74 makes it clear that Iwam (with two dialects) and Amal are the members of the Iwam Family within the Upper Sepik Stock, Wogamusin and Chenapian are members of the Wogamusin Family within the same stock, and Abau is a family-level member of the stock. This classification is set out more clearly in Laycock and Z'graggen (1975) and Wurm (1982).

The data from this report agree with the composition of the Wogamusin Family, with 35% probable cognates being observed between Wogamusin and Chenapian and a maximum of 10% between either of them and any other word list in the survey.

Chenapian is spoken by one village just off the Sepik River near the mouth of the Leonhard Schultze River. The population reported in Laycock (1973) as 187 has increased to approximately 250.

Wogamusin is spoken by nearly 400 people living in four hamlets: Biaka, Kubkain, Washkuk (also known as Washkuk Antap) and Yamanumbu.

At this time we also submit additional information on the relationship between May River Iwam and Sepik River Iwam, termed upriver and downriver dialects respectively by Laycock (1973). Sepik Iwam (downriver dialect) is spoken by people living in the villages⁸ of Hauna (Yauenian), Oum No.1, Oum No.2, and Tauri. May River Iwam (the upriver dialect) is spoken by the people who live at Abagaisu, the May River Patrol Post, Pekwe, Painu, Aumi, Auni, Iabrem, Ibu, Wanium, Wanamoi, Auom, Iemomburi, Arai, Waniap, Burumai, and Mowi. Iniok is a language (or dialect) boundary between the two. The Iniok people can communicate reasonably well with Sepik River Iwam speakers and with some difficulty with Iwam speakers at Mowi. The probable cognate percentage in our data is 61%, which we feel is quite reliable, since it is based on lists which are

known to be quite accurate and is based on detailed investigation of both languages (dialects). Of the 51 Sepik Iwam verbal affixes, only 17 are recognisable as related to verbal affixes or particles in May River Iwam. The observed intelligibility between the two is relatively low. Everyone who knows Tok Pisin uses it instead of their vernacular for communication. Communication through the vernacular is quite difficult with the one exception of the people of Inlok, who live on the linguistic border and can communicate reasonably well with both groups.

The relationship between May River and Sepik Iwam is an example of the Lexical-grammatical skewing in which the cognate percentage with the noun and verb stems from such a word list as the one used in this survey is high enough to suggest at least some intelligibility, but the actual intelligibility is relatively low due to crucial grammatical differences in verbal affixation, pronouns and locatives.

The same skewing phenomenon occurs between two bordering languages in the Ndu Family, Iatmul and Manambu, although in this case there is no chain of mutual intelligible dialects, as in the case of Iwam. The intelligibility is equally as low as between May River and Sepik Iwam, even though the cognate percentages between the two with a word list similar to the one used here is well over 70%.

Whether the relationship between May River and Sepik Iwam is described as two divergent dialects or two closely related languages depends on one's definition of dialect. On the criterion of mutual intelligibility, they are definitely two different languages. On the criterion of being opposite parts of a dialect chain, they could be considered two dialects of a single language.

5. SOCIOLINGUISTIC DATA

In an attempt to understand the general sociolinguistic situation in the area under consideration, we here summarise our observations and the responses to the sociolinguistic questionnaires under four main topics: (1) knowledge of Tok Pisin and English, (2) attitude toward and use of vernacular (3) interaction with outside contacts and (4) level of formal education. This part of the report reflects the situation as observed in May 1983 except where otherwise indicated.

The knowledge of Tok Pisin in general varies directly with the amount of outside contact. If the knowledge of Tok Pisin could be quantified, the Wogamusin group would be at the high end of the scale, followed by Chenapian. At the other end would be the Piame people, who had two or three men beginning to learn Tok Pisin, and Pikaru, with no Tok Pisin speakers at all. All the other groups would lie somewhere in between, with the older people near the low end of the scale and the younger people and some middle-aged men nearer the upper end. A general characterisation of each group follows.

WOGAMUSIN FAMILY

Wogamusin and Chenapian both have somewhat similar sociolinguistic situations. Both groups have a positive attitude toward their vernacular, which is very functional and is used freely along with Tok Pisin. Tok Pisin is well known by everyone except the very elderly. The Catholic mission school at Kubkain is an educational centre with 21 students from Kubkain, six from Washkuk, and 17 from Chenapian. Wogamusin is further advanced in education with many readers among the young people, some among the middle aged, and a few young men who have attended the University of Papua New Guinea. At Chenapian, off the main river, by contrast, several have finished standard

6. The people from both languages use the Tauri aid post, the Hauna trade store and occasionally the hospital at Ambunti. Their social contacts are within each group, between the two groups, and also with Hauna. Chenapian also has social contact with Oum 1 and Tauri. Wogamusin also reports social contact with Swagup.

LEONHARD SCHULTZE STOCK/PHYLUM

For every language group in this phylum, the vernacular is very functional and their attitude toward it is very positive.

The Yabio people have contact with several Saniyo villages, particularly Mapisi (for medical and store purposes) and Sowano. Several Yabio women have married into Saniyo villages. One half of the population at Sowano are Yabio speakers. Since Woswari has been nearly abandoned, there is little contact with any villages on the Leonhard Schultze River. Tok Pisin is spoken by all the middle aged and younger men. Four girls attended the Ambunti Akademi school but found it difficult because of their lack of knowledge of Tok Pisin. There are about six children who are semi-literate.

TUWARI

Tok Pisin is spoken by most of the men under 30 years of age and by some of the younger women. The others are beginning to learn it to some degree. There are no known literates, but a Tok Pisin school was planned for Sumwari in 1984.

The Tuwari people who live at Sumwari have contact primarily with just themselves and the Niksek people who live there with them. They also have occasional contact with the few Tuwari people who live at Niksek, and with the few Tuwari people who live at Akiapmin. The latter have primary contact with the two Duranmin villages of Siliambil and Siliam.

PAPI

The Papi people all know Tok Pisin to some degree except for the very oldest. The men and boys and some women know it quite well. There is no school in the area. There were only two Tok Pisin literates, both trained at Ambunti and the Baptist Mission School at Duranmin. There is some contact with a school at Aom, but no known students were identified. The people have contact with the mining company at the Frieda River airstrip for medical and store purposes. For social purposes they visit the May River Iwam villages of Waniam and the May River Patrol Post, Tafe (at the mouth of the Frieda River) and the few Papi speakers who live at Wasimai on the Leonhard Schultze River.

DURANMIN

The Duranmin people have some contact with the Tuwari people living at Akiapmin as well as frequent contact with the Telefol speakers and others who live at Duranmin airstrip and are involved in the Baptist Bible School. No intermarriage was reported, but the contact with the Telefol people has been sufficient to cause most of the younger generation to have learned Telefol. Tok Pisin is known to some degree by all but the older people. It is used somewhat along with vernacular. There are very few literates.

PAI AND WALIO

The Pai and Walio speakers form a similar sociolinguistic group. Tok Pisin is spoken to some degree by nearly everyone except the older generation and a few women. The people have contact

with each other and with Hauna for social contacts. They go to Hauna and Tauri for medical purposes and to Hauna for buying purposes. Until recently education has been minimal except for those who have gone to school outside, usually at Ambunti. Walio had 13 students in a local Tok Pisin school started by some Hauna men. A number of people can read Tok Pisin at Walio and eight of the Pai people are also literate in Tok Pisin.

The Walio people have had fairly close contact with the Pai people as evidenced by some intermarriage and also by the existence of a trade language called Yahipiri, which is known by most of the adult men in Walio, Pai, and some of the Sepik Iwam men from Hauna. This is evidence of prolonged and close contact between these three groups.

The Pai people have contact with some Saniyo speakers, primarily through the link of the village of Paru, which is on a tributary of the Wogamus River.

SEPIK HILL STOCK LANGUAGES

The Niksek people have fairly extensive contact with the Niksek and Tuwari people at Sumwari, which is in fact the area of origin of the majority of the Niksek people, according to their reports. There is also some contact with the Piame people when they come to visit Niksek, where two Piame men were in a Tok Pisin school. The only instance of intermarriage reported was one man marrying a Piame woman.

The South Seas Evangelical Church station at Niksek is the primary channel for meeting the educational, medical, buying, and spiritual needs of the Niksek people. In 1983 there were approximately 50 literates in Tok Pisin. There were also 39 students in English school in standard 1. All children, teenagers, and men under about 35 spoke Tok Pisin to some extent and the older men and some younger women were in the process of learning to speak it. The vernacular is very functional and their attitude toward it is positive. They use it freely along with Tok Pisin.

The Saniyo-Hiyewe people have extensive contact with groups outside their language boundaries. They have much and very free interaction with the Yabio villages of Lariaso and Harepi and with the western villages of the Hiyewe dialect, to such a degree that most of the male Yabio speakers over 15 years of age know the Hiyewe dialect. There is a fair amount of contact between Pai and several Hiyewe villages. Intermarriage is fairly common where Pai women marry Saniyo men. One Saniyo man has gained access to garden ground through his marriage to a woman from Pai. Sio has limited interaction with the village of Biaga at the junction of the April and Wogamus Rivers. Intermarriage has occurred but it is rare. As Pekapeki is separated from the rest of the language group by a vast swamp, it has practically no contact with the rest of the Saniyo language group. The people of Pekapeki have trading and social interaction with the people of Kakiru and downriver with the people of Bitara. They also have contact with the South Seas Evangelical Church station at Niksek (April River) airstrip.

Mapisi with a population of 126 is centred around Pacific Islands Ministries (formerly Ambunti Akademi) and the Mapisi (Maposi) airstrip. Marepute'e claims 100 people and is built around a South Seas Evangelical Church pastor and school. Sio, population 70, has a Seventh Day Adventist Church teacher and a small school.

Piame and Pikaru both have primarily a monolingual situation. Tok Pisin was so little known that it was almost impossible to elicit anything on the sociolinguistic questionnaire. Two or three Piame men were in the process of learning to speak, read, and write Tok Pisin at the South Seas Evangelical

Church station at Niksek. One Piame woman was married to a Niksek man. No other known cases of marriage outside these two language groups were found.

The extent of outside contact is uncertain except that we are sure there is considerable contact between the two groups. They worked together building the helicopter pad on which we landed. Also a few Piame men can communicate to some degree with some of the Pikaru men. Some Piame men reported that the Pikaru people do have fairly extensive contact with some of the Enga people of the south side of the Central Range.

6. WIDER RELATIONSHIPS

There is some evidence of a remote contact relationship between the languages of the Sepik Hill Stock and the Leonhard Schultze Stock. The following similar forms in Figure 4 may well be borrowings.

LEONHARD SCHULTZE STOCK			SEPIK HILL STOCK			
1.	Tuwari	<i>he pa'aru</i> <i>hetřo</i>	'knee' 'foot/leg'	Saniyo Hiyewe	<i>pa'aře</i> <i>řowe ?uporo</i> (<i>řowe</i>)	'bone' 'knee' 'leg')
2.	Tuwari	<i>owa</i>	'older brother of man'	Saniyo	<i>owane</i>	'important person'
3.	Yabio	<i>nimau</i>	'eye'	Sumwari (Niksek)	<i>ni</i>	'eye'
4.	Tuwari	<i>tifə (lowe)</i> (<i>lowe</i> is a noun classifier, so <i>tif</i> is here compared with Kapiano <i>diho</i>)	'belly'	Kapiano (Niksek)	<i>diho</i>	'belly'
5.	Pai	<i>ape</i>	'bird'	Sumwari (Niksek)	<i>ape</i>	'bird'
6.	Lexical item for 'white':					
	Walio	<i>wapuřə</i>		Sumwari (Niksek)	<i>wapoawe</i>	
	Woswari (Tuwari)	<i>wahu?ore</i>		Saniyo	<i>wapo</i>	
	Papi	<i>sauwařep</i>				
	Duranmin	<i>warepu</i>				

FIGURE 4: COMPARISON OF SIMILAR FORMS IN SEPIK HILL AND LEONHARD SHULTZE STOCKS

The only other evidence of a relationship between the two stocks are the adjectival suffixes which appear in Saniyo-Hiyewe of the Sepik Hill Stock which may be related to the adjectival classifiers in certain languages of the Leonhard Schultze Stock.

7. CONCLUSIONS

This study is an attempt to further clarify some of the lesser-known relationships among the languages of the Sepik Hill Stock and the Leonhard Schultze Stock which are spoken in the more inaccessible areas. Thus, it is one effort to follow the suggestions of Dye, Townsend and Townsend (1968) that 'further research by other scholars is needed to fill in the gap still remaining in the April headwaters area' and to 'establish the wider relationships of other newly reported languages in this area'.

The question of wider genetic relationships between the Sepik Hill Stock and the Leonhard Schultze Phylum/Stock Family is still problematic and open for further research.

8. NOTES

1. The list of published surveys includes Loving and Bass (1964), (Amanab Sub-district), Dye, Townsend and Townsend (1964) ('Sepik Hill' region), Healey (1964) and Wurm (1965:378-382) (Telefomin area), Laycock (1965b) and (1973) (region where Upper Sepik Stock languages are spoken), and the summary given in Wurm (1982:209-219). Laycock has also assisted in identifying a number of word lists from this region and in giving a preliminary classification of languages in this region as well as the other Sepik languages (Laycock 1973).
2. We gratefully acknowledge the help of all the administration personnel who cooperated and assisted in the survey project. Specifically we mention patrol officers K.U. Onipay and John Siau, who gave us access to the patrol reports and census figures of patrols in the areas covered by this survey.

We are also greatly indebted to missionaries Fritz and Sieglinda Urschitz of the South Seas Evangelical Church, who gave us a wealth of background information including the movements of many of the Niksek people. We also thank them for their hospitality during our time at Niksek (April River) airstrip.

We also thank Pastor Jacob at Niksek, Pastor Joshua who was stationed at Sumwari, and Pastor Luke who was stationed at Marepute'e, all of the South Seas Evangelical Church, for their help and encouragement during our time in their respective areas.

We acknowledge the help of the two Piame men who walked from the Niksek airstrip to the headwaters of the Niksek (April) River in order to organise a group of Piame and Pikaru people to make a helicopter pad for us to land in this very remote area.

We thank Steve Eelkema of Pacific Island Ministries for the use of their facilities at Mapisi for a storage and fuel depot.

We also appreciated the help of Debbie Ross, Sue Harris, Marilyn Laszlo, and Shirley Killoosky, all of the Summer Institute of Linguistics, who gathered word lists and sociolinguistic data from the villages of Walio, Kubkain, Chenapian, and Washkuk. We also thank Paul Vollrath of the SIL who supplied a number of word lists taken on a previous survey in the south-western part of the area covered by this survey.

We acknowledge the help of Bob Kennel of New Tribes mission for supplying us with a Bisorio word list.

There were many people whom we met on the survey who cooperated graciously in supplying word lists and answering many questions regarding their language and the sociolinguistic situation in their area – their help too we gratefully acknowledge.

Finally, we thank the large number of our colleagues and their families who did much of the detailed work of copying, typing and entering the many word lists in final form for comparison and for others who prepared these for counting and calculation by the computer at the Jungle Aviation and Radio Services Center in Waxhaw, North Carolina.

Transportation for this survey was primarily by helicopter, with the travel costs paid by the Sociolinguistic Survey fund of the Sepik Region of the Papua New Guinea Branch of the Summer Institute of Linguistics. We thank the Papua New Guinea SIL Aviation Department and helicopter pilots Bob Bartels and Bill Cristobal for their willingness to provide transportation even to the most inaccessible areas.

Finally we acknowledge the help of Bob Bugenhagen and Richard Loving of SIL for making helpful comments on an earlier draft of this paper.

3. See Bee and Pence (1962), Ezard (1977) and Oswalt (1971).
4. See Note No.2.
5. Bruce divided the Sepik Hill Stock/Family into three basic subgroups defined by common sound changes, diverging at three levels. The tree developed by Bruce (Figure 5) demonstrates which sounds change at each level. Note that Paka refers to the language which is here called Niksek.
6. We are indebted to Fritz Urschitz for calling this to our attention.
7. See Figure 6.
8. The spelling of Iwam villages used here is taken from Laycock (1973).

9. APPENDICES

9.1 LEXICOSTATISTIC RELATIONSHIPS

Figures 6 and 7 indicate the lexicostatistic relationships observed in this survey. Several other word lists from bordering language areas not visited on this survey (May River Iwam, Bisorio, Enga, Bahinemo) are also included in these tables for comparison.

Figure 6 shows the general relationships in the survey area and focuses on the sharper definition of two languages, Niksek and Bisorio, along with some of their varying dialects.

Figure 7 highlights the Leonhard Schultze Stock and the Wogamusin Family.

9.2 WORD LISTS

A set of word lists for some relatively little known languages is included in Figure 8. This list includes various dialects of Bisorio, including our two Pikaru lists, and the Bisorio list supplied by Bob Kennel of New Tribes Mission. Lists for Enga, Piame, and Hewa, three languages bordering the Bisorio-Pikaru area, are also included for comparison.

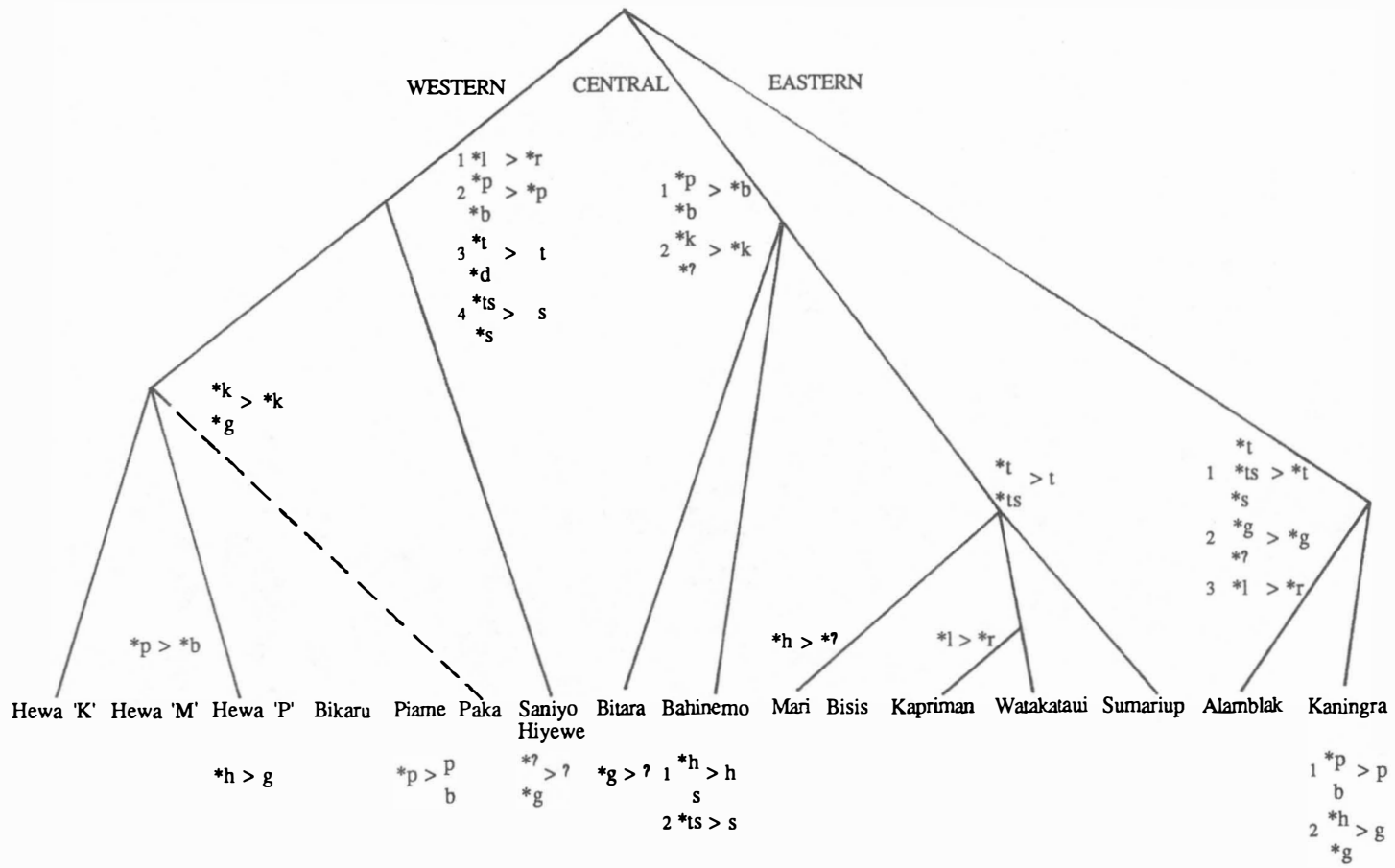


FIGURE 5: SEPIK HILL STOCK/FAMILY CLASSIFICATION BY LES BRUCE

Tuwari																				
29 Yabio 1 (Harepi)																				
29 69 Yabio (Yanamo)																				
24 24 30 Pai																				
20 26 27 43 Sinen																				
19 26 28 42 66 Walio																				

6	9	9	6	6	3	Bitara														
8	11	12	5	6	7	23	Hewa 1 (Sisimin)													
7	11	11	5	5	6	22	71	Hewa 2 (Moribunim)												
5	6	6	6	6	5	20	14	15	Bahinemo											
7	6	6	3	3	4	28	33	36	17	Piame										
13	10	9	6	7	7	20	38	46	20	44	Kapiano									
11	7	7	5	5	5	29	36	38	23	51	67	Sumwari 1								
10	9	9	5	5	5	31	37	41	23	52	68	91	Sumwari 2							
9	8	8	5	5	5	31	39	39	22	50	62	88	91	Sumwari 3						
10	9	9	6	5	7	30	39	41	22	49	59	77	82	80	Meiyari					
9	8	8	5	5	6	28	36	39	24	50	64	87	90	86	77	Setiali				
8	7	7	5	5	5	27	36	39	23	53	61	81	84	82	72	84	Wiriyarife			
4	9	9	4	4	4	41	24	25	20	33	37	46	50	50	52	46	45	Pukapuki		
6	10	13	7	5	7	29	22	23	18	30	35	44	47	46	47	44	42	72	Hiyewe	
6	4	4	5	6	5	3	3	3	1	2	3	2	3	2	3	2	1	2	3	Enga
4	3	4	4	4	3	5	5	8	4	7	8	8	8	8	8	8	7	5	4	21 Bisorio
6	4	4	5	5	5	4	7	7	4	9	12	9	8	8	8	8	7	3	3	18 58 Pikaru 1
5	3	4	5	5	5	4	9	8	3	9	12	10	9	9	9	9	8	4	4	19 62 74 Pikaru 2
3	4	5	6	5	6	1	6	6	3	4	6	6	5	5	5	5	6	5	5	3 3 4 5 Duranmin
4	3	4	5	6	4	5	4	5	4	3	5	4	4	4	4	4	4	3	3	3 4 4 4 2 May River Iwam (Pekwai)
2	2	3	3	3	1	3	4	5	2	3	5	4	4	4	5	4	4	3	3	3 3 2 2 2 61 Sepik Iwam (Hauna)

= Niksek

- indicates Leonhard Schultze Stock
- _____ indicates family or sub-family
- ===== indicates a single language with various dialects

FIGURE 6: GENERAL RELATIONSHIPS

Chenapien																	
35	Wogamusin 1 (Kubkain)																
35	98	Wogamusin 2 (Washkuk)															
5	6	6	1	Pai 1													
5	6	6	1	94	Pai 2												
3	3	3	1	44	39	Walio											
3	3	4	1	44	40	67	Sinan										
5	4	4	1	23	23	20	11	Tuwari 1 (Sumwari)									
2	3	3	1	15	15	15	13	47	Tuwari 2 (Akiapmin)								
3	4	4	1	22	18	26	26	29	17	Woswori							
6	2	2	1	9	7	6	6	13	10	10	Papi						
5	3	4	1	25	21	27	26	29	14	52	8	Yabio (Harapei)					
7	5	6	1	31	27	29	27	29	16	57	11	69	Yabio (Yanamo)				
10	9	9	5	4	5	5	10	8	8	6	8	8	Sumwari 3				
9	5	5	7	6	7	5	6	4	9	6	10	13	46	Hiyewe			
9	7	7	3	3	1	3	2	1	1	0	2	3	4	3	Sepik River Iwam (Hauna)		
10	7	8	5	5	4	6	4	2	1	1	3	4	4	3	61	May River Iwam*	
2	2	2	6	5	6	5	3	3	5	10	4	5	5	5	2	1	Duranmin

----- indicates Leonhard Schultze Stock

_____ indicates Wogamusin Family

* (Pekwai)

FIGURE 7: LANGUAGES OF THE UPPER MIDDLE SEPIK, LEONHARD SCHULTZ AND FRIEDA RIVERS

English	Pikaru 1	Bikaru (Bragge)	Bisorio	Enga	Piame	Biami (Bragge)	Hewa 1
afternoon	<i>aribo</i>	<i>lowu</i>	-	-	<i>pasikofi</i>	<i>nu basi'o</i>	<i>moxuepi</i>
arrow	<i>somu</i>	<i>bawi</i>	-	-	<i>bawe</i>	<i>yenepi</i>	<i>inε</i>
ashes	<i>siaenusi</i>	<i>heme</i>	<i>seya mumu</i>	<i>(isare)pac</i>	<i>nakwai kaniwo</i>	<i>balui</i>	<i>ye une</i>
axe	<i>patafiya</i>	<i>awi</i>	-	<i>wua tombyuwa</i>	<i>+šuwəñi</i>	<i>solu</i>	<i>stnu</i>
baby	<i>wabi hogia</i>	<i>nauwa</i>	-	<i>nyana</i>	<i>mokuawo</i>	<i>awaiwo</i>	<i>ɣman baten</i>
back	<i>mosase</i>	<i>makia</i>	<i>mosale</i>	<i>mata</i>	<i>mekia</i>	<i>nabai</i>	<i>mogi</i>
bad	<i>osa</i>	<i>ali</i>	-	<i>koo</i>	<i>yeli kəñixa</i>	<i>foluwa</i>	<i>puw</i>
banana	<i>xai</i>	<i>kemeno</i>	<i>kxai</i>	<i>kyaya</i>	<i>kəne</i>	<i>kaikkaik</i>	<i>kan/kon</i>
belly	<i>eimuse</i>	<i>wafei</i>	<i>imu</i>	<i>tomba</i>	<i>di'εfi</i>	<i>iefe</i>	<i>ome'p</i>
big	<i>xakai</i>	<i>sebiēni</i>	<i>gauwa</i>	<i>andake</i>	<i>yaki khei</i>	<i>nyinori</i>	<i>tuwa</i>
bird	<i>nega</i>	<i>bamuwi</i>	<i>hega</i>	<i>yaka</i>	<i>ye'lia</i>	<i>siliawi</i>	<i>nuk</i>
bites, he	-	-	-	<i>nelyamo</i>	-	-	-
blood	<i>guguwa</i>	<i>ibiba</i>	<i>kukuba</i>	<i>king mange</i>	<i>matei</i>	<i>hasai</i>	<i>matai</i>
bone	<i>farari</i>	<i>heli holi</i>	<i>tgoboi</i>	<i>kuly</i>	<i>kəkəřə</i>	<i>pakala</i>	<i>bakali</i>
boy	<i>wabi</i>	<i>wabi</i>	-	<i>wane</i>	<i>məmenəfoni</i>	<i>mamansa biani</i>	<i>miyan baten</i>
breast	<i>aru (sε)</i>	<i>ami</i>	<i>adu</i>	<i>anju</i>	<i>mokhu</i>	<i>ane</i>	<i>mom</i>
black	<i>tuma</i>	<i>wonofu</i>	<i>duono</i>	<i>porombaiya</i>	<i>yeliawi</i>	<i>yeli</i>	<i>siřoguma/ teriyogume</i>
brother, (older)	<i>kauwari</i>	<i>pato</i>	<i>hambage</i>	<i>yangone</i>	<i>neiya</i>	<i>pato</i>	<i>ya/(ano)iya</i>
cassowary	<i>raima</i>	<i>bokaplai</i>	<i>kubono</i>	<i>lamya</i>	<i>wəřou</i>	<i>molufu</i>	<i>wəlou/wəro</i>
chin	<i>kapina</i>	<i>aia</i>	-	<i>angapu</i>	<i>a yopakañi</i>	<i>ebili</i>	<i>ai</i>
claw	<i>hibose</i>	<i>lokolu</i>	-	<i>kimbu pambe</i>	<i>nətikap</i>	<i>salami</i>	<i>yokope tafupei</i>
cloud	<i>yagad</i>	<i>kotumai</i>	<i>mole</i>	<i>kopa</i>	<i>kətou</i>	<i>niakeli</i>	<i>səpu/nikeřa</i>

English	Pikaru 1	Bikaru (Bragge)	Bisorio	Enga	Piame	Biame (Bragge)	Hewa 1
dog	wena	maniau	weina	suwa	yabi	biso	yao/wəŋa
ear	hari	monu	hak	kale	peni	penia	aŋe
egg	gila	nou	hapa	kapa	yelia kaia	ko	ŋe
earth	keke	kati	yugege	yuu	napoŋi	bula	numəbəri
elbow	logo	loku	-	kyukyunaya	nəti'komu	odiolowoni	latiyam
eye	tada sɛ	manowa	dada	lenge	yinnafa	manaua	ingau/ngau
fat	ya	linopo	eŋenega	kapa	wauwuo	ŋe	wau
father	arowa	saiu	atowa	takano	aise	atoa	eta/aiya
fire	seya	sia	seya	isare	yeni'e	yeyi	yo
fish	raga	ibabufu	laka	kingi	kənə kabiai	ene	walɔ/metala
flying fox	xobi	ufuwin	-	kamye	iklau	kotiali	wen
foot	kai	kay	-	kimbu	nowa	woli	wari
forehead	wona	nihoholi	wono	enamba	mafŋei	lobo	map
frog	xodi	kadi	-	mugi	kodi	se'yala	uwal
girl	wida bogiya	taŋio	-	wanake	məmiyaŋi məməni moku'awo	miali mamane	ɣlmau/yəman
good	haila	boafe	haila	keyange	yelia kowane	u'e	piya
hair	yomodi edise	awe	yomoadi idi	kyawasi	kouŋinobo	uweli	obobuk/opopuk
hand	kise	lokolu	gi	kingi	nəti	fafulu	lati/amai
head	yomodise	kobagala	yomodi	kyawa	koubəkələ	fo linopo	ɔu/ou/o
heart	sirise	nabodada	-	mona	matei	yinafo	enap
house	ta	ka da	ata	anda	ake	ka	wai/wa'
knee	hagise	kha	-	wapambu	u'kwəti	toku	moiyow/watiyum

English	Pikaru 1	Bikaru (Bragge)	Bisorio	Enga	Piame	Biami (Bragge)	Hewa 1
knife	<i>yakiyafa</i>	<i>wele</i>	<i>tsitsiwano</i>	<i>wuo kema</i>	<i>misañi</i>	<i>misali</i>	<i>piclepe</i>
leaf	<i>yoho</i>	<i>yoku</i>	<i>yoxo</i>	<i>isa yoko</i>	<i>mekwa</i>	<i>me'o</i>	<i>me ofei</i>
leg	<i>sirise</i>	<i>monolu</i>	<i>giho</i>	<i>kimbu</i>	-	<i>wali</i>	-
lies down, he	<i>popo</i>	<i>fwai</i>	-	<i>palamo</i>	<i>məfu'aiwo</i>	<i>onui</i>	<i>seki</i>
long	<i>tosa</i>	<i>luluwau</i>	<i>dosa</i>	<i>londe</i>	<i>yelia meisa</i>	<i>maise</i>	<i>(nuk) meis</i>
louse	<i>mirise</i>	<i>nowmi</i>	<i>leima</i>	<i>oro</i>	<i>nəmi</i>	<i>maniu</i>	<i>onam</i>
man	<i>wabi se</i>	<i>mumani</i>	<i>gai</i>	<i>akali</i>	<i>məmini'nəni</i>	<i>lipofi</i>	<i>mobi/məbi</i>
many	<i>potori</i>	<i>umali</i>	<i>kxoyo</i>	<i>malu</i>	<i>ake/kəñisibəbe</i>	<i>daba dabo</i>	<i>(nuk) ketuwa</i>
meat	<i>xoa</i>	<i>yebala</i>	<i>kxowa</i>	<i>mena</i>	<i>ye'lia/y'eliya</i>	<i>ene</i>	<i>apau/apfao</i>
moon	<i>papume</i>	<i>pamwi</i>	<i>hana/babume</i>	<i>kana</i>	<i>pasiti'owa</i>	<i>selietie</i>	<i>əpu/yariaup</i>
morning	<i>pamabi</i>	<i>no nana wi</i>	-	<i>yangama</i>	<i>patšie</i>	<i>fumi'a</i>	<i>selito</i>
mother	<i>mauwa</i>	<i>miu</i>	<i>mauwa</i>	<i>endangi</i>	<i>mio</i>	<i>mauwa</i>	<i>ma</i>
mouth	<i>habuse</i>	<i>ai</i>	<i>habulu</i>	<i>nenge kata</i>	<i>a'ya</i>	<i>ebeli</i>	<i>pile</i>
name	<i>howasu</i>	<i>wapi</i>	<i>tbi</i>	<i>kingi</i>	-	<i>pafe</i>	<i>wi</i>
neck	<i>masasi</i>	<i>maisa</i>	-	<i>pendoko</i>	<i>ka'lami</i>	<i>lo'o</i>	<i>ese/simeni</i>
net bag	<i>nou</i>	<i>koa</i>	-	<i>nyuu</i>	<i>ko</i>	<i>oho</i>	<i>ou</i>
new	<i>oisawi</i>	<i>keke</i>	<i>kxado</i>	<i>enenge</i>	<i>ake/akutu</i>	<i>nebeli</i>	<i>atapene</i>
night	<i>ori</i>	<i>nu yali yau</i>	<i>uwele</i>	<i>kukwa</i>	<i>pasime</i>	<i>nubaio</i>	<i>geliaku</i>
nose	<i>towise</i>	<i>waka</i>	<i>dowi</i>	<i>gyeε</i>	<i>keřemi</i>	<i>kalemi</i>	<i>kogi</i>
old	<i>petei</i>	<i>bete'ifio</i>	<i>madi</i>	<i>wambarae</i>	<i>akelmeisi</i>	<i>wolio</i>	<i>petepea</i>
old man	<i>kas kei</i>	<i>madi</i>	-	<i>akali alemo</i>	<i>bəubiy'eipa</i>	<i>luwaiipa</i>	<i>e'patu</i>
old woman	<i>rira kose kei</i>	<i>maniaru</i>	-	<i>enda endemo</i>	<i>məmiyařuyeipa</i>	<i>iawane</i>	<i>lalitu</i>

English	Pikaru 1	Bikaru (Bragge)	Bisorio	Enga	Piame	Biama (Bragge)	Hewa 1
one	<i>hubiya</i>	<i>mai'i</i>	<i>hapila</i>	<i>mendaki</i>	<i>mekwa</i>	<i>pi'ofi</i>	<i>ᵗᵇᵃᵍᵃᵗᵢ</i>
pig	<i>ya</i>	<i>ya</i>	<i>manalya</i>	<i>mena</i>	<i>a'kaifo/fɔ</i>	<i>fɔ</i>	<i>apfao/apau</i>
rain	<i>kegi</i>	<i>lelawi</i>	-	<i>apu</i>	<i>nou</i>	<i>sobu</i>	<i>no/nu meiyai</i>
rat	<i>sibo</i>	<i>iapa</i>	<i>yanema</i>	<i>wui</i>	<i>wamo</i>	<i>sebo</i>	<i>wantu</i>
red	<i>mofi</i>	<i>mifiai</i>	<i>mopi</i>	<i>kone</i>	<i>yelia wapo'awe</i>	<i>lokuwawa</i>	<i>məbiyeima</i>
road	<i>yoto</i>	<i>yu</i>	<i>yodo</i>	<i>kata</i>	<i>yui</i>	<i>yo</i>	<i>ɾone</i>
root	<i>siya feri</i>	<i>pilio</i>	<i>ppu</i>	<i>isa pingi</i>	<i>youwei</i>	<i>menana</i>	<i>menap/manapi</i>
sand	<i>keci</i>	<i>noku</i>	<i>iba kedi</i>	<i>kee</i>	<i>kařinei</i>	<i>ki</i>	<i>ɔpɔpile</i>
short	<i>sobngiya</i>	<i>lapu</i>	<i>tsobagiya</i>	<i>muu</i>	<i>yelia nɔpo</i>	<i>ifiau</i>	<i>abiya/kɔptu</i>
shoulder	<i>konowa</i>	<i>yoko</i>	<i>kanowa</i>	<i>lange</i>	<i>kələ</i>	<i>ara</i>	<i>ale</i>
sister, older	<i>wida xa hai</i>	<i>toli</i>	<i>humanege</i>	<i>kakinyi</i>	<i>tolia'no</i>	<i>lomoto</i>	<i>mo'you/watium</i>
sits, he	<i>haruno</i>	<i>amaki fuo</i>	<i>bagama badamo</i>	<i>petamo</i>	<i>mərouwa</i>	<i>fufwai</i>	<i>isai</i>
skin	<i>hapaise</i>	<i>kha</i>	<i>habai</i>	<i>yanenge</i>	<i>kabei</i>	<i>toku</i>	<i>nati</i>
small	<i>hogiya</i>	<i>ofɔ</i>	<i>hogila</i>	<i>kuki</i>	<i>yaki nioni</i>	<i>ei</i>	<i>(nuk) pətene</i>
smoke	<i>papahu</i>	<i>sobudaye</i>	<i>seya mosu</i>	<i>(isare) sukwa</i>	<i>yeisi</i>	<i>watamasoye</i>	<i>yese</i>
snake	<i>mari</i>	<i>hanou</i>	<i>tsitstwano</i>	<i>kau</i>	<i>afeka</i>	<i>poni</i>	<i>mei</i>
stands, he	<i>kaiegiu</i>	<i>kinal</i>	<i>igiyamo</i>	<i>karamo</i>	<i>kina ki'awi</i>	<i>niwo</i>	<i>saiyapu</i>
star	<i>hareda</i>	<i>yeli</i>	<i>hadeda</i>	<i>mbui</i>	<i>youtafo</i>	<i>pa'i</i>	<i>nikenenaf</i>
stone	<i>hana</i>	<i>baki</i>	<i>hana</i>	<i>kana</i>	<i>yaki</i>	<i>yawi</i>	<i>pai</i>
sugar cane	<i>heila</i>	<i>nalioa</i>	-	<i>lyɛɛ</i>	<i>situ</i>	<i>situ</i>	<i>aria/ariya</i>
sun	<i>yagi</i>	<i>mauwuru</i>	<i>yage</i>	<i>neta</i>	<i>yei</i>	<i>tenia</i>	<i>yai/baiyei</i>
sweet potato	<i>weriya</i>	<i>panae</i>	-	<i>kwai</i>	<i>a'koi</i>	<i>nikiau</i>	<i>amou/amu</i>

English	Pikaru 1	Bikaru (Bragge)	Bisorio	Enga	Piame	Biami (Bragge)	Hewa 1
tail	<i>yɛrise</i>	-	<i>yede</i>	<i>konali</i>	<i>ɔ'yəni</i>	-	<i>wau isou</i>
taro	<i>sawi</i>	<i>hebo</i>	-	<i>maa</i>	<i>sawi</i>	<i>mowa</i>	<i>saw/tabrimo</i>
tooth/teeth	<i>nesi</i>	<i>nci</i>	<i>ne</i>	<i>nenge</i>	<i>pi'nafa</i>	<i>bi'ei</i>	<i>pilenaf ~ p'renap</i>
thumb	<i>you</i>	<i>yau</i>	-	<i>kingi mange</i>	<i>nɔtipi'kɔfi</i>	<i>bofi</i>	<i>nami/awaiobei</i>
tomorrow	<i>tadi benabi</i>	<i>kinelo</i>	-	<i>takya</i>	<i>tuki</i>	<i>nelilio</i>	<i>woto</i>
tongue	<i>keda</i>	<i>soləwi</i>	<i>geda</i>	<i>kekenge</i>	<i>sə'ɛfa</i>	<i>salifei</i>	<i>tol</i>
tree	<i>siya</i>	<i>yinu</i>	<i>tseyā</i>	<i>isa</i>	<i>me</i>	<i>mei</i>	<i>me</i>
two	<i>rabo</i>	<i>ho'i</i>	<i>damo</i>	<i>lama</i>	<i>wəki</i>	<i>lumeli</i>	<i>iyai</i>
vine	<i>pu</i>	<i>so</i>	-	<i>puu</i>	<i>you'wei</i>	<i>iuwei</i>	<i>lei/lemaf</i>
walk, he	<i>yorohu</i>	<i>fasi</i>	-	<i>pelyamo</i>	<i>fisi</i>	<i>miwo</i>	<i>pani pisi</i>
wallaby	<i>wesina</i>	<i>wasin</i>	-	<i>mapona</i>	<i>akai pəsi</i>	<i>pasi</i>	<i>pəsi/pes</i>
water	<i>zewa</i>	<i>mawu</i>	<i>iba</i>	<i>ipwa</i>	<i>a'sei</i>	<i>sai</i>	<i>ɔci ate</i>
white	<i>yage fauwati</i>	<i>teli</i>	<i>tsuba</i>	<i>kakepame</i>	<i>yelia məfi' yawi</i>	<i>yenowiwa</i>	<i>waume</i>
wind	<i>howusu</i>	<i>filikai</i>	<i>pəbato</i>	<i>porambaiya</i>	<i>wisərsi</i>	<i>wisesi</i>	<i>nupuwi</i>
wing	<i>papaga</i>	<i>pinafa</i>	<i>babaga</i>	<i>papake</i>	<i>yeř kineiwiu</i>	<i>pibi</i>	<i>koruwa</i>
woman	<i>wida</i>	<i>momiaru</i>	<i>wida</i>	<i>enda</i>	<i>məmi'yařu</i> <i>ye'lia</i>	<i>aweni</i>	<i>ruwa/luwa</i>
yam	<i>hemi</i>	-	-	<i>amu</i>	<i>kařu</i>	-	<i>akoweola</i>
yesterday	<i>pənabi</i>	<i>nelika</i>	-	<i>kwaka</i>	<i>nɔfi</i>	<i>ufai</i>	<i>woto</i>

FIGURE 8: DIALECTS OF BISORIO AND CONTIGUOUS LANGUAGES

9.3 GENERAL SOCIOLINGUISTIC SITUATION INTERVIEW

Gavman i save kolim wanem nem long ples bilong yupela? _____

Yupela yet i kolim wanem nem long ples bilong yupela? _____

A. IMPACT OF EXTRA-TRADITIONAL FACILITIES

1. Ol manmeri bilong dispela ples i save go long wanem haus sik?
 Planti i save go o sampela tasol?
 Yupela save go long haus sik bilong stretim wanem kain sik?

2. Ol manmeri bilong dispela ples i save baim ol samting long wanem tret stua?
 Yupela save baim ol wanem kain samting?
 Planti manmeri inap long baim samting, o sampela tasol inap?

3. Ol manmeri long dispela ples i save go long wanem lain lotu?
 Ol i save lotu we?
 Wanem lain lotu long hia i gat planti manmeri i save go long em?

4. Ol pikinini bilong dispela ples i save go long wanem skul?
 Haumas pikinini man i save go long ol dispela skul?
 Haumas pikinini meri i save go long skul?

5. I gat wanpela rot ka i stap klostu long dispela ples? Em i stap we?
 I gat wanpela ples balus i stap klostu long hia? Em i stap we?
 Ol moto kanu i save kam klostu long dispela ples o nogat?

6. Ol manmeri bilong dispela ples i gat wanem rot bilong painim mani?
 Wanem kain bisnis em i nambawan bisnis ol manmeri long hia i save wokim?

7. I gat sampela lain i save lusim ples na i go painim wok long taun o stesin?
 Wanem lain ol i mekim olsem?
 Ol i save go long wanem ples?

8. I gat manmeri bilong arapela hap i kam stap hia or nogat?

9. Ol dispela lain i lusim ples na i go stap long narapela hap, ol i save kam bek long ples long wanwan krismas or nogat?

10. Long lusim asples hia, yu ting dispela pasin em i gutpela o em i nogut?
 Yu stori liklik long as tingting bilong yu long dispela pasin.

B. SOCIAL INTERACTION PATTERNS

(Answers to questions 1-3 are to be entered in the chart below.)

1. Ol manmeri bilong dispela ples i save go raun long wanem ples oltaim?
 Haumas taim ol inap i go?
2. Bilong wanem ol manmeri i save go long ol dispela ples tasol?
3. Kolim nem bilong ol stesin na ol taun yupela i save go raun long ol?

Nem bilong ol ples na stesin	Haumas taim ol inap go?	Bilong wanem as tru ol I save go
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(Answers to questions 4-11 should be entered in the chart below.)

4. Ol manmeri bilong wanem ples ol i save askim yupela long go long singsing bilong ol?
5. Wanem kain samting yupela save baim long ol arapela ples?
6. Ol manmeri bilong arapela ples i save baim wanem samting long yupela, na ol lain bilong wanem ples tru?
7. Ol meri bilong yupela i bin kam long wanem lain ples?
8. Yupela save baim ol meri o nogat?
9. Ol meri bilong ples bilong yupela i save go marit long wanem arapela ples?
10. Ol i save givim yupela pe bilong meri o nogat?
11. Long ol ples yupela i bin kolim nem bilong ol pinis, wanem tok ples yupela i save mekim taim yupela i go long ol?

Nem bilong ol ples	Ol singsing
	Bilong baim samting
	Wanem samting yupela save baim long ol?
	Bilong salim samting
	Wanem samting yupela save salim long ol?
	Bilong maritum meri?
	Yupela mas baim ol meri o nogat?
	Ol meri bilong yupela i save marit we?
	Yupela save kisim pe long ol o nogat?
	Yupela i save mekim wanem tok ples?

12. Ol manmeri bilong ples bilong yupela i save wok bung wantaim ol arapela ples o nogat? Olsem long wok bilong misin, na gavman, bilong didiman, bilong skul, na haus sik no ol kain wok olsem?
Wanem kain wok tru, na wantaim wanem ples?

C. REPORTED DIALECT DIFFERENCES

1. Tokim mi long wanem ol ples i save mekim tok ples wankain tru olsem yupela.

2. Nau tokim mi long wanem ol ples i save mekim tok ples wankain olsem yupela, tasol tok bilong ol i arakain liklik?

3. Nau tokim mi long wanem ples i save mekim wankain tok ples olsem yupela, tasol ol i toktok arakain tru, tasol yupela i ken harim na i klia.

4. Wanem ples i save mekim wankain tok ples olsem yupela, tasol taim ol i toktok ol i save mekim arakain tru na hariap, olsem yupela i no inap harim gut olgeta toktok ol i mekim?

5. Wanem ples i stap klostu tru long yupela tasol ol i save mekim narakain tok ples olgeta?

9.4 LANGUAGE USE AND ATTITUDES QUESTIONNAIRE

A. REPERTOIRES/LANGUAGES KNOWN

Languages to be considered: Vernacular, Lingua Franca, Church Languages, English, other vernaculars if significant numbers of people are bilingual in them.

	Man 1	Man 2	Man 3	Man 4
Haumas krismas bilong yu?				
Man o meri?				
Wanem tok ples yu save tru long em?				
Inap toktok?				
Inap ritim?				
Inap raitim?				
Your evaluation of their abilities	<hr/> <hr/> <hr/>			

Haumas krismas bilong
papa bilong yu?
Wanem tok ples papa bilong
yu i save tru long em?
Inap toktok?
Inap ritim?
Inap raitim?

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Haumas krismas bilong
mama bilong yu?
Wanem ol tok ples mama
bilong yu i save tru long em?
Inap toktok?
Inap ritim?
Inap raitim?

--	--	--	--

Haumas krismas bilong
meri bilong yu?
Wanem ol tok ples meri
bilong yu i save tru long em?
Inap toktok?
Inap ritim?
Inap raitim?

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Haumas krismas bilong ol
brata bilong yu?
Wanem ol tok ples brata
bilong yu i save tru long em?
Inap toktok?
Inap ritim?
Inap raitim?

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Haumas krismas bilong
ol susa bilong yu?
Wanem ol tok ples susa
bilong yu i save tru long em?
Inap toktok?
Inap ritim?
Inap raitim?

--	--	--	--

Haumas krismas long
 pikinini man bilong yu?
 Wanem ol tok ples pikinini
 man bilong yu i save tru
 long em?
 Inap toktok?
 Inap ritim?
 Inap raitim?

--	--	--	--

Haumas krismas bilong
 pikinini meri bilong yu?
 Wanem ol tok ples pikinini
 meri bilong yu i save tru
 long em?
 Inap toktok?
 Inap ritim?
 Inap raitim?

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B. LANGUAGE FUNCTIONS

1. Olgeta taim yupela toktok wantaim ol lapun man, yupela save mekim long wanem tok ples? _____
2. Olgeta taim yupela toktok wantaim ol lapun meri, yupela save mekim long wanem tok ples? _____
3. Olgeta taim yupela toktok wantaim ol yangpela man, yupela save mekim long wanem tok ples? _____
4. Olgeta taim yupela toktok wantaim ol yangpela meri, yupela save mekim long wanem tok ples? _____
5. Olgeta taim yupela toktok wantaim ol liklik boi, yupela save mekim long wanem tok ples? _____
6. Olgeta taim yupela toktok wantaim ol liklik meri, yupela save mekim long wanem tok ples? _____
7. Taim yupela i kros yupela save mekim long wanem tok ples? _____
8. Yupela save mekim stori tumbuna long wanem tok ples? _____
9. Yupela save kaunim namba long wanem tok ples? _____
10. Yupela save beten long wanem tok ples? _____

C. LANGUAGE SITUATIONS

1. Taim bilong mekim toktok bilong lokol gavman, yupela mekim long wanem tok ples? _____
2. Yupela mekim tumbuna singsing long wanem tok ples? _____

3. Taim yupela stap long ol singsing, wanem tok ples yupela save mekim? _____
4. Taim yupela i go wok long gaden wantaim arapela manmeri, wanem tok ples yupela save mekim? _____
5. Long taim yupela toktok nating wantaim ol pren, yupela mekim long wanem tok ples? _____
6. Wanem kain tok ples yupela save mekim long haus bilong yu yet? _____
7. Wanem kain tok ples yupela save mekim long maket? _____
8. Wanem ol tok ples yu bin lainim pastaim? _____
 bihain? _____
 bihain gen? _____
9. Long haus lotu
 - a. Ol i autim tok long wanem tok ples? _____
 - b. Ol i beten long wanem tok ples? _____
 - c. Ol i singsing long wanem tok ples? _____
 - d. Sapos wanpela man bilong longwe ples i autim tok, ol i save tanim tok, o nogat? _____

D. AESTHETICS/APPROPRIATENESS/UTILITY

1. Sapos yu laik ol lain bilong yu i harim toktok bilong yu klia tru, yu ting yu mas mekim long wanem tok ples? _____
2. Wanem kain tok ples yu mas save sapos yu laik i go painim wok? _____
3. Long taim bilong autim tok bilong Jisas, wanem tok ples i gutpela bilong ol lain i ken klia olgeta? _____
4. Yu ting God papa i laikim wanem tok ples? _____
5. Wanem tok ples em i gutpela long taim bilong toktok long ol samting ol tumbuna i save bihainim, olsem masalai o sanguma samting? _____
6. Long taim bilong singsing wanem tok ples em i gutpela long mekim tumbuna singsing? _____
7. Wanem tok ples yu ting ol tisa i mas mekim long skul? _____
8. Wanem tok ples ol tisa i mas skulim ol pikinini long skul? _____
9. Wanem tok ples i gutpela tru long kisim save, sapos yu save rit na rait long em? _____
10. Wanem ol tok ples yu ting yu laik save long em? _____
11. Yu laik ol pikinini bilong yu bai i ken save long ol wanem tok ples? _____
12. Yu ting tok ples bilong yu i gutpela olsem tok Pisin/Motu o tok Inglis, o nogat? _____

E. LANGUAGE CHANGE

1. Long taim ol pikinini i kamap bikpela yu ting bai ol i save moa long wanem tok ples? _____

2. Bihain, bihain tru, yu ting bai ol manmeri i ken holim tok ples bilong ol, o ol i mas lusim tok ples bilong ol na mekim tok Inglis tasol, o tok pisin, o narapela tok ples tasol?
 Wanem tingting bilong yu stret long dispela?
 Tok ples bai ol i ken holim, o em bai i pinis?
-
-
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CARTOGRAPHIC AND TECHNICAL PROBLEMS IN THE PRODUCTION OF A COMPLEX LANGUAGE ATLAS: THE *LANGUAGE ATLAS OF THE PACIFIC AREA*

S.A. WURM AND T. BAUMANN

1. GENERAL REMARKS

The *Language atlas of the Pacific area* of which part 1 was published late in 1981 and the second, final, part at the end of 1983 (Wurm and Hattori 1981, 1983), constitutes a major achievement resulting from international collaboration in the scholarly field and in top-level cartography. The atlas project, based on over a quarter of a century of scholarly work in the field in the Greater Pacific area, aimed at the collection of the necessary background information for the production of a major language atlas with many of the results of this work published in the major publications series *Pacific Linguistics* which is issued through the Department of Linguistics of the Research School of Pacific Studies of the Australian National University.

The project required over five years of concentrated production work and cartographic work to bring it to conclusion. The atlas was edited by Stephen A. Wurm of the Research School of Pacific Studies of the Australian National University and the Australian Academy of the Humanities, and Shirô Hattori of the Japan Academy, and a range of co-ordinating editors, consulting editors and editorial advisers from Australia, Pacific countries and countries outside the Pacific area itself collaborated in its production. Its publishers are the Australian Academy of the Humanities in collaboration with the Japan Academy, with the assistance of the Departments of Linguistics and of Human Geography in the Research School of Pacific Studies of the Australian National University. At the recommendation of the Australian Academy of the Humanities and the Japan Academy, the International Union of Academies placed the atlas project under its auspices as a major international academic project. It recommended it for sponsorship and financial support to the International Council of Philosophy and Humanistic Studies (UNESCO) which made annual grants, at the maximum level permissible under its rules, available to the atlas project. Very substantial financial assistance enabling the project to get off the ground came from the Australia-Japan Foundation, and major financial help was provided by the Japan Academy, and by Australian private enterprise, especially by ESSO Australia Pty Ltd and ACI Industries Proprietary Ltd.

The atlas consists of 47 numbered multi-coloured maps, 500 x 360mms in size, with each map containing six to nine basic colours and a very large range of various types of hatchings and symbols in several colours. The accompanying text gives demographic, bibliographical and other relevant information. The first part of the atlas deals with the New Guinea area, Oceania and Australia and contains 24 numbered maps, one index map and a total of 76 pages. The second part covers the Japan area, Taiwan, the Philippines, and mainland and insular South-east Asia, and contains 23 numbered maps and a total of 74 pages. The atlas has been printed by Kümmerly + Frey AG, in Berne, Switzerland and the world distributors are GeoCenter in Stuttgart, West Germany.

The Pacific area is linguistically the most complex part of the world. About two thousand distinct languages, with a very large number of dialects, are located in the Pacific islands area and in marginal regions to the west of the Pacific area proper. Most of these two thousand languages are concentrated in the south-western part of the Oceanic Pacific area. There are three main large language groups there, Austronesian, Papuan (or non-Austronesian), and Australian. Most of the languages in the South-east Asian marginal areas belong to groups other than these three. In addition, there are a number of pidgin and trade languages in the Pacific area. As has been mentioned, a very large amount of research work has been carried out in the language situation in the Pacific area over the last twenty-five years or so, and the immensely complicated language picture in practically all its parts has been very largely clarified and its nature recognised. This new understanding of the distribution, grouping and classification of the languages of the entire Pacific area has made it possible to compile this comprehensive *Language atlas of the Pacific area* which provides the fullest possible up-to-date information on the language situation in the greater Pacific area.

The understanding of the complex language situation in the Pacific area is of relevance to a very wide variety of interests, many of them not directly linked with language work and scholarly endeavour in general. The atlas is therefore of value, for scientific and pragmatic purposes, to a broad range of scholars such as linguists, anthropologists, archaeologists, geographers, demographers, sociologists, historians, political scientists, economists and many natural scientists whose fields of interest are directly or indirectly connected with human beings. Such scholars would be, for instance, physical anthropologists, geneticists, ethnobotanists, agriculturalists, ethnozoologists, as well as geomorphologists, geologists and oceanographers interested in past geological and climatological events which had some effect upon human populations, and for which past human migrations traceable by the spreading of languages for instance, provide corroborating evidence. Scholars in medical sciences, such as epidemiologists, may also find this atlas of value.

The atlas provides easily understandable, detailed graphic information whose lack has until now created serious problems hampering the understanding of a great range of situations. The *Language atlas of the Pacific area* reaches out also to a wide variety of governmental, administrative and other agencies and persons with applied interests of relevance to the Pacific area: foreign affairs departments, media services, politicians, educationists, bodies concerned with economic and developmental aid, health organisations, other United Nations and UNESCO agencies, and last, but not least, to the peoples of the Pacific area themselves, notably those of the newly independent nations.

The cartographic work for the entire atlas has been carried out by Theo Baumann, formerly of the Cartographic Section in the Department of Human Geography, Research School of Pacific Studies, Australian National University, Canberra, and now on the staff of the Department of Linguistics of the same Research School. The typesetting of the extensive text materials in the atlas was carried out in the Research School of Pacific Studies of the Australian National University, predominantly within

the Department of Linguistics, and the text layout was attended to by the cartographer. All photographic plates for the maps and the text materials were produced in the photographic section of the John Curtin School of Medical Research, of the Australian National University.

The cartographic production of the atlas constitutes an outstanding achievement of old-fashioned cartography carried out exclusively by painstaking hand work with the help of simple instruments and cartographic tools.

2. GENERAL PROBLEMS OF THE CARTOGRAPHIC PRODUCTION OF THE ATLAS

In general, the cartographic work on the atlas faced a number of major problems and difficulties which the cartographer, in collaboration with the scientific editors of the atlas, had to overcome, and he had to devise ways and means to deal with them effectively. These various difficulties can be subsumed under five major headings:

2.1 SKETCH MAPS AND OTHER MATERIALS FROM WHICH THE CARTOGRAPHER HAD TO WORK

The sketch maps and other materials which were made available to the cartographer for the basis for the work on the individual maps, had been prepared by dozens of different people in many countries in various parts of the world. They were based on a range of different principles, and suppositions, and were produced in a variety of scales on different map projections and in a great multiplicity of varying styles of presentation. The principles governing the indication of language areas, dialect regions, the borders between language groups of different hierarchies as well as those between languages and dialects, the choice of colours for the presentation of these features on the sketch maps and the rendering of other important information on them, differed vastly with the various sketch maps. It was one of the very exacting tasks of the cartographer in collaboration with the scientific editors to bring all this varied information to a common denominator and to work out standardised principles of representation so as to achieve a reasonable degree of uniformity of presentation and rendering of the information on the maps of the atlas.

2.2 COMPLEXITY OF INFORMATION

A particular difficulty for the cartographic production of the atlas arose from the enormous complexity of the information to be presented on the maps and the atlas as a whole. On several of the maps, up to 200 different languages, as well as hundreds of dialects, had to be shown in a clearly recognisable and immediately obvious manner of representation. In many cases, the space available for an individual language or dialect amounted to no more than a few square millimetres, in spite of the sometimes very large scale of the maps. The reason for this is the fact that in many instances, individual languages are spoken by only a few hundred or in extreme cases, only a few dozen speakers (Wurm, ed. 1975, Wurm 1982). In addition to the necessity for a clear and lucid cartographic representation of the language and dialect distribution and of the inclusion of the languages in smaller and larger groups of differing hierarchical order, it was essential that the multiplicity of the colours, hatchings, and screenings presented an artistically acceptable and pleasing impression on each map.

A particular problem which applied to several of the maps was the presence of cases of geographical overlap between two or several languages in the same area. Ways and means had to be

found to show the regions and nature of such cases of overlap, without resorting to additional overlay maps. A variety of different types of screening and other cartographic means had to be used to clearly, unambiguously, and at the same time pleasingly, display such situations on the maps.

Another serious problem was the necessity to show, on some maps, language situations prevailing at different points in time. For instance, the location, as well as the relationship to other languages and membership to language groups, of languages now extinct had to be shown on some maps. However, the areas formerly occupied by them are now occupied by different languages which may have different relational affinities, and this situation which in cases involved the overlapping of three different languages in one area, had to be shown through cartographic means in a clear and straightforward, and at the same time, artistically pleasing manner. Another problem demonstrating the complexity of the information to be presented on the individual maps was connected with the fact that in many instances, the same language or dialect occurred in a number of geographically discontinuous areas, sometimes scattered in tiny pockets over wide areas in the territories of other languages. It was necessary to indicate, in a lucid and unambiguous manner, that these small scattered language areas constituted a single language and belonged together, without overloading the map with confusing information.

The enormous complexity of the information to be shown on the individual maps resulted in the maps being in danger of becoming overloaded with a multiplicity of names of various kinds such as language names, dialect names, geographical names and many others. Cartographic ways and means had to be found to cut down the number of these names without losing clarity and the unambiguous nature of the information presented. A number of varied cartographic techniques had to be resorted to to achieve this, one of them using certain combinations of colours and hatchings to unambiguously indicate language groups and individual languages which made it unnecessary to include the names of these language groups or languages themselves on the map, and it was only necessary to give clear indications of the respective combinations of colours and hatchings in the legends of the maps along with the names of the language groups or languages denoted by such combinations of colours and hatchings. Other methods included the replacement of individual names by numbers or letters in upper case or lower case, and the listing of these numbers and letters together with the respective names indicated by them, in relatively uncluttered spaces on the maps such as sea areas, making sure at the same time that the location of the numbers or letters themselves in areas of the map, and the placements of such explanatory listings, were as near as possible to each other.

Another quite serious problem reflecting the complexity of the information on the individual maps resulted from the necessity of including a very extensive amount of information in the legends accompanying the individual maps. Shortage of space to accommodate everything that had to be included in individual legends became a very real problem and a number of special approaches had to be resorted to to compact the information in the smallest possible space. For instance, up to four different combinations of colours and hatchings had to be shown in a single, small, rectangular space, making sure that there was a logical connection between these various combinations of colours and hatchings, and also that the brief explanations added giving the names of groups were clear and unambiguous.

A very special problem connected with both the maps themselves and the legends was the adequate differentiation, in terms of the colour perception of the human eye, of the various, often very numerous, combinations of colours, screenings and hatchings, which had to be employed to show the sometimes dozens of different groups of languages appearing on a single map. With several maps, it was necessary to obtain full colour proofs and to change a number of the colours and

combinations of colours, screens and hatchings quite drastically, so as to ensure sufficient separability of different groups on the map and in the legend for the eye of the user, and at the same time to produce an effect which was not jarring on the eyes.

2.3 EQUIPMENT AND FACILITIES

As has already been indicated, the cartographic work for the atlas had to be carried out with the help of relatively unsophisticated cartographic materials and equipment, and with comparatively simple facilities. It was necessary for the cartographic work to be done as cheaply as possible to keep the cost of the production of the atlas reasonably low, and at the same time to achieve, as far as possible, outstanding results. Since no scribing equipment was available, all maps had to be hand-drawn. Also it would have been possible to use photographic screening to achieve the multicoloured effect, but the necessary equipment was not available. For this reason, full colours had to be used, with the various maps containing up to eight or nine basic full colours, and very extensive use of zippaton and hand-drawn screens had to be resorted to. This made much greater demands on the skills of the cartographer than would have been necessary if more sophisticated equipment had been at hand, and added to the complexity of the processes involved in the production of the individual maps.

2.4 PHOTOGRAPHY AND PRINTING FILMS

To make it easier to accommodate the immense amount of complex information included in the individual maps, the final hand-drawn maps by the cartographer were considerably larger than the printed version of the maps which as has been mentioned above, was 500 x 360mm. This made it necessary for the final printing films to be reduced from the final cartographic originals. The equipment required for this delicate photographic operation was not available at the cartographic section of the Department of Human Geography in the Research School of Pacific Studies of the Australian National University, and the final printing films had to be reduced to the required size in the photographic section of the John Curtin School of Medical Research of the Australian National University. The reduction process itself was carried out on a very old processing camera, and this and the fact that it was not possible to reduce the printing films in the cartography office itself led to many registration problems. Also, the reduction of the final printing films from the larger hand-drawn maps produced by the cartographer created some problems in those cases in which a few minor corrections had to be made after the printing films had been produced. Every one of these corrections, e.g. corrections to names appearing on the map, had to be photographically reduced to precisely match the reduction rate of the final printing films, and making cartographic corrections to the printing films themselves was limited by the technical possibilities of making such corrections on photographic films as opposed to making them on the original versions of the maps as drawn by the cartographer. This problem applied equally well to the text materials included in the atlas. As has been mentioned above, these text materials were typeset in the Research School of Pacific Studies, largely in the Department of Linguistics and also through the School Services of the Research School of Pacific Studies and Research School of Social Sciences administration, in accordance with certain format principles laid down in consultation between the scientific editors, the text editors and the cartographer. When the typeset information which had been produced in columnar form, was given to the cartographer for final layout work, he added more typefaces for titles, headlines etc. and finally produced a well-balanced layout of textual information which was to be put on the back of the respective maps to which this textual information referred, or to be printed on separate sheets of paper

accompanying the maps themselves. Once the final layout work was complete, it was sent to the photographic section of the John Curtin School of Medical Research of the Australian National University for the production of the final printing film. Again, the typeset pages were done on a larger scale than the final printed version, and printing films reduced in size had to be produced for the latter.

2.5 PRINTING OF THE ATLAS

The fact that the maps were printed in Switzerland resulted in a number of unexpected problems which were largely attributable to the difference of the climate in Canberra and in Berne where the printing was carried out by the Swiss firm Kümmerly + Frey. The different average humidities in the two places concerned produced distortions of the printing films which led to quite serious registration problems and made it necessary for several of the films to be mounted anew in Switzerland by the cartographer who had travelled there to assist in the preparation of the printing films for the print-run and to supervise the printing itself.

3. CARTOGRAPHIC PROBLEMS WITH INDIVIDUAL MAPS IN THE ATLAS

3.1 PART 1 OF THE ATLAS

As has been pointed out above, part 1 of the atlas covers the New Guinea area, Oceania, and Australia. Of the 24 numbered maps in it, not less than 14 are devoted to the island of New Guinea, including some of the larger islands to the east of it, i.e. to present the language situation in Irian Jaya and Papua New Guinea. This has been necessary because of the enormous complexity of the language situation in Irian Jaya and Papua New Guinea, in which well over 900 different languages are located, with a much greater number of dialects.

The problems and difficulties resulting from this for the cartographer and for the cartographic representation of the language situation are obvious and come essentially under the first two headings mentioned above in discussing the nature of the general problems involved in the cartographic production of the maps in the atlas. In particular, problems connected with the enormous complexity of the information to be presented on the various maps loomed high with maps of Irian Jaya and Papua New Guinea. Especially the maps number 6 which shows mainly the language situation in the Sepik Provinces of Papua New Guinea (Laycock 1973), number 7 which shows mainly the language situation in the Madang Province of Papua New Guinea, and map 8 which in the main depicts the language situation in the Morobe Province of Papua New Guinea and adjacent areas, are very complex and indicate the location, dialect situation, membership of larger groups and the often scattered distribution of well over 100 languages each, with all the associated difficulties of having to contend with tiny language areas, the overloading with names, problems connected with the choice of colour and hatching combinations and others as mentioned above. Questions of the overlapping of language areas also play a part with these maps. The difficulties associated with accommodating all the necessary information in the legend of these three maps has made it necessary for two of these, maps number 6 and 7, to be accompanied by detailed legends which are additional to the main general legends printed on the maps themselves, with these additional legends printed on separate half-size sheets each. The additional legend added to map number 7 contains not less than 76 rectangular areas showing different colour and hatching combinations with explanations, and the one added to map

number 6 contains 67 such rectangular areas. The difficulties involved in choosing suitable colour and hatching combinations for areas of such linguistic complexity are obvious.

The maps covering Oceania, i.e. Island Melanesia, Micronesia and Polynesia which together number five, show problems comparable to those encountered on the Irian Jaya and New Guinea maps, though to a somewhat lesser extent. In this, it has to be kept in mind that for instance all of the languages of Vanuatu which are dealt with on map number 16 and which number over 100, with numerous dialects, belong to one major language group (Tryon and Hackman 1983), for which a single base colour had to be used. The distinction between the various sub-groups and language groups by cartographic means, against this uniform background, proved no minor task.

Four of the maps are devoted to the area of Australia and Tasmania. Of these maps, that of Northern Australia, which is map 23, offers extremely complex problems in terms of colour choice, because of the multiplicity of different major language groups (Wurm 1972), each of which has had to be distinguished by a separate colour or colour-combination. The addition of an additional legend on a half-size sheet was also found necessary, with this legend showing 49 rectangular areas, each of them devoted to a different colour or colour combination with different hatchings, with the required explanation added to each of these rectangular areas.

Part 1 of the atlas concludes with a very complex map, map number 24, which deals with the pidgin languages, trade languages and *lingue franche* of Oceania and Australia. Because of the vastness of the areas covered, the map had to be subdivided into a number of regional maps, and the cartographic task was rendered particularly difficult by the fact that a large number of the many languages which had to be depicted, are at present either extinct or at various stages of linguistic or at least functional extinction which had to be indicated by the use of special cartographic techniques in each instance. Questions of the overlapping of several languages in the same area also had to be dealt with, and the former presence of now extinct languages in areas occupied by other such pidgin languages or *lingue franche* today had to be shown in several instances. Equally, the spread and areal expansion of some of these languages in the course of time, and the directions of such expansions, had to be depicted cartographically, as was the case with the varying functions of one and the same language over a span of time. For instance, a language may have started as a *lingua franca* adopted by a mission and changed later into a non-missionary *lingua franca*, or alternatively a language may have been spoken as a local trade language in pre-European days and was later adopted by a mission as a missionary *lingua franca*. All these various roles and functions had to be indicated on the map through special cartographic techniques.

3.2 PART 2 OF THE ATLAS

Although the maps constituting part 2 of the atlas deal with the language situation in regions which are outside the New Guinea area and Oceania, some remarks on the cartographic difficulties associated with them may be of interest for comparison.

Part 2 of the atlas deals with the Japan area, Taiwan, the Philippines, and mainland and insular South-east Asia, with a general map of the language groups in the Greater Pacific area, map number 25, at the beginning of part 2. This particular map presented only minor cartographic difficulties, though the vastness of the area and the resulting smallness of some regions to be shown in individual colours caused some problems.

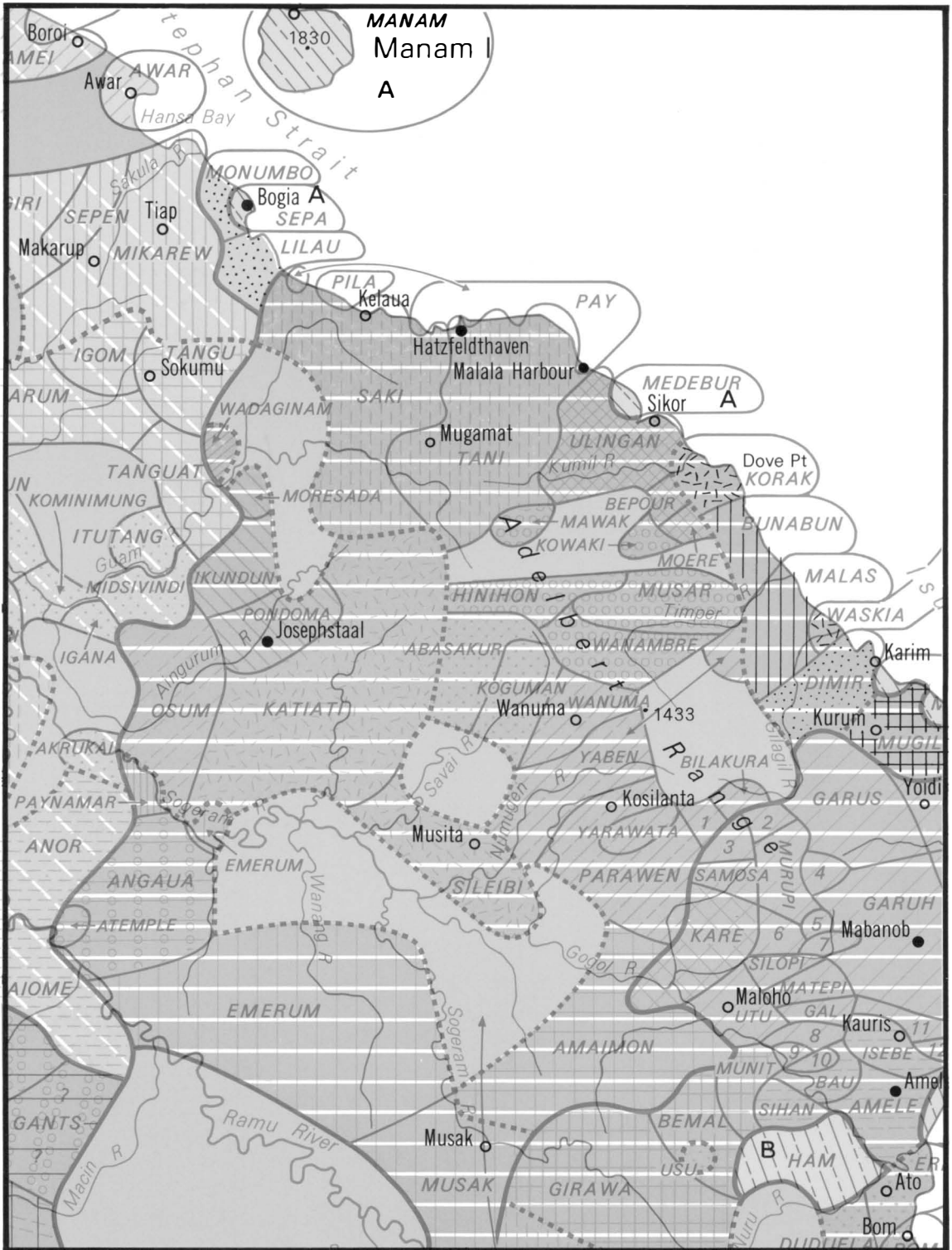
The four maps of the Japan area differ vastly from each other in their roles in the atlas and in consequence in the cartographic problems which they offer. One of the maps, the map of the Japanese dialects, which is map number 27, is a map like many others in the atlas, and employs a variety of colours and hatchings, with a few problems resulting from the smallness of the areas occupied by some of the dialects. The other three maps are of a very different kind: they provide information essentially through the choice of a great variety of coloured symbols on a neutral coloured background, and through the employment of a range of different types of linguistic borders. The choice of the symbols and of the different types of borders presented problems arising from the necessity of distinguishing the information provided by them clearly and at the same time achieving an artistically pleasing effect.

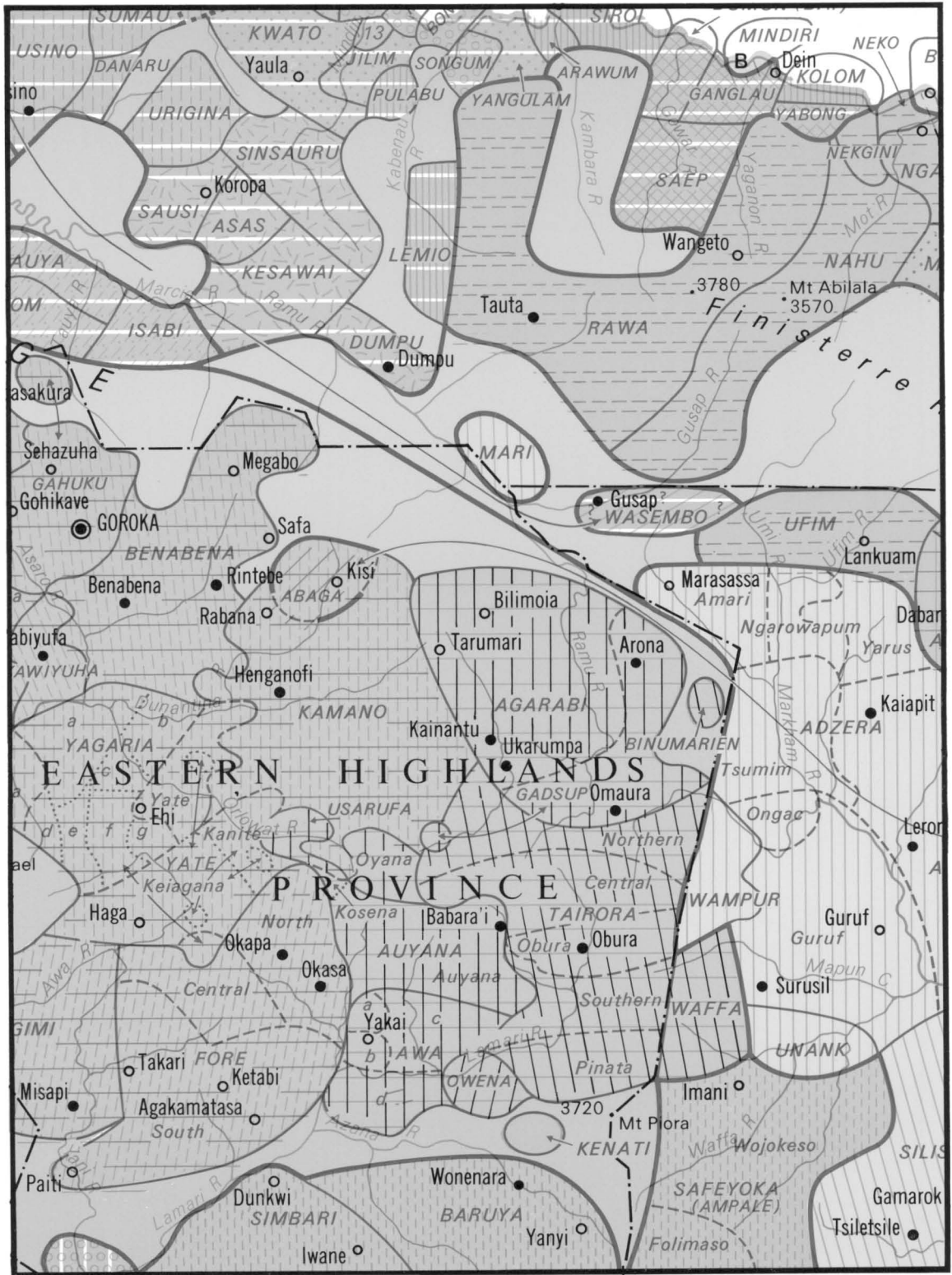
The map of Taiwan presented only a few minor problems stemming from the fact that a large number of the languages included in it are extinct and their former locations had to be shown against the general background of other languages now occupying their former areas. While this presented no great difficulties, the maps of the Philippines area of which there are four in number, offered some quite serious challenges to the cartographer's skill and ingenuity. Not only is there frequent overlap in the Philippines between the areas of different languages, but there are also a number of major languages in the Philippines whose currency extends far beyond the regions originally occupied by them, and which overlay the areas of many other local languages. Ways and means had to be found in which this situation could be presented in a lucid and unambiguous way and a number of varied cartographic techniques had to be resorted to, to achieve this end in an aesthetically pleasing manner.

The maps of the northern and southern parts of mainland South-east Asia (numbers 35 and 36) were amongst the most complex maps in terms of scattered small areas of the same languages or of dialects of the same language. Linking them by arrows or other cartographic devices would have led to serious overloading of these maps. Other techniques had to be found to present the picture clearly, such as the special use of colours or combinations of colours or hatchings. The overloading with names was another problem on these maps with the map of peninsular Malaysia (number 37) offering, in addition, problems resulting from extensive overlapping of languages. At the same time it was necessary to indicate, on the latter, areas of now extinct languages. This has led to situations in which up to three overlapping language areas had to be shown clearly by different cartographic techniques making this map one of the most difficult of the entire atlas.

Eight maps are devoted to insular South-east Asia in the atlas. Of these, two maps, i.e. those of Sumatra (number 38), and of Java and Bali (number 39), presented no significant cartographic problems. Four other maps concerned with Sulawesi (numbers 43 and 44), the Moluccas (number 45), and the Lesser Sunda Islands and Timor (number 40) offered problems connected with the presence of scattered language areas in the regions dealt with and of a multiplicity of quite small language areas which the cartographer had to contend with. At the same time, the two maps for the northern and southern parts of Borneo (numbers 41 and 42) presented particularly acute difficulties in containing a very large number of tiny, scattered language and dialect areas separated by sometimes quite vast distances. Again, the multiplicity of these small scattered areas made it impossible to resort in all cases to the use of arrows to connect these various scattered areas.

The map of the pidgin languages, trade languages, and *lingue franche* in the Philippines and mainland and insular South-east Asia which constitutes map number 46, offered fewer problems than its counterpart in part 1 of the atlas which is map number 24, though a few problems had to be overcome with the help of symbols.





The last map of part 2 of the atlas, which is a map of the varieties of Chinese in the greater Pacific area, offered special problems arising from the fact that the varieties of Chinese were almost exclusively concentrated in larger towns, and special devices had to be resorted to to indicate the hierarchial relationships in the relative numbers of speakers of up to five varieties of Chinese in any one town or centre.

4. FURTHER LANGUAGE ATLASES

The last map of the *Language atlas of the Pacific area* (see immediately above) leads over to the first sequel to that atlas which is another major atlas project, i.e. a *Language atlas of China* which is also an international project, under the auspices of the Australian Academy of Humanities and the Chinese Academy of Social Sciences, with the assistance of the Department of Linguistics and of the Cartographic Section in the Research School of Pacific Studies of the Australian National University. This project has also been adopted for sponsorship by the International Union of Academies and recommended by it to the International Council of Philosophy and Humanistic Studies for sponsorship and financial backing. Again, the maximum annual grant permissible under the rules has been awarded to this project. The cartographic work on this atlas is also carried out by Theo Baumann, the cartographer responsible for the *Language atlas of the Pacific area*, and the atlas is presenting problems of a kind very similar to those which characterised the work on the maps of the *Language atlas of the Pacific area*, though it is now possible to use much more sophisticated methods, tools and techniques in producing it.

Another similar project, on which work is in progress, is concerned with the production of an atlas of the languages of intercultural communication in the greater Pacific area which comprise numerous pidgin and creole languages, various types of other *lingue franche* including trade languages, as well as other languages employed for intercultural communication in the greater Pacific area.

The cartographic problems presented by the maps in this atlas arise mainly from the fact that quite often, information on given languages has to be presented from a dynamic point of view, i.e. against a time scale, which means that the origin, expansion and spread, functions, roles and significance and, if applicable, diminishing of importance, contraction of the geographical area of currency and eventual falling into disuse of given languages have to be shown on the various maps through the use of complex cartographic techniques. Again, Theo Baumann is the cartographer producing the maps of this atlas.

The next language atlas to follow is one of the indigenous languages of South America which is in the advanced planning stage, and is expected to present cartographic problems comparable to those encountered in the production of the maps of the *Language atlas of the Pacific area*. Again, Theo Baumann is the cartographer responsible for this atlas.

5. CONCLUDING REMARKS

The *Language atlas of the Pacific area* and the atlases following it offer an extensive range of interesting and sometimes quite exacting cartographic problems. The various and multiple solutions resorted to for their solution, constitute a matter of considerable interest to cartographers and people interested in the cartographic representation of a variety of complex linguistic and other information on multi-coloured maps.

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