

COUNTING AND CULTURE CONTACT IN NORTH-EAST NEW GUINEA

Geoff P. Smith

INTRODUCTION

This paper starts with an investigation of the numerals of the languages of the Morobe Province, Papua New Guinea. The relationship between the distribution of the different language families and types of counting system occurring in them is then examined. There is found to be a certain amount of consistency in the type of counting system found within families, but there are also unexpected variations. The limited extent of the numeral series in the Morobe Austronesian languages is particularly conspicuous, and the possible role of culture contact in this apparent regression is examined.

LANGUAGES OF MOROBE

There are just over 100 languages spoken in the Morobe Province; 40 of these are Austronesian, while 60-odd are non-Austronesian (McElhanon 1984). As with other parts of New Guinea, many of the Austronesian languages are in coastal or offshore locations, but unlike other parts of the island, there is also a considerable penetration inland. The Adzera and Buang families occupy a large inland area around Mumeng and in the Markham Valley a considerable distance from the coast at some points. In the central ranges are the non-Austronesian languages of the Angan, Binanderean and Kunimaipen families, while in the Huon Peninsula are the Eastern and Western Huon, Erap, Wantoat, Yupna and a number of minor families. It is assumed that speakers of non-Austronesian languages have been in the area considerably longer than speakers of Austronesian languages, although establishing accurate dates of settlement is difficult. The degree of penetration of the Austronesian languages into Morobe also suggests that a long interaction has taken place.

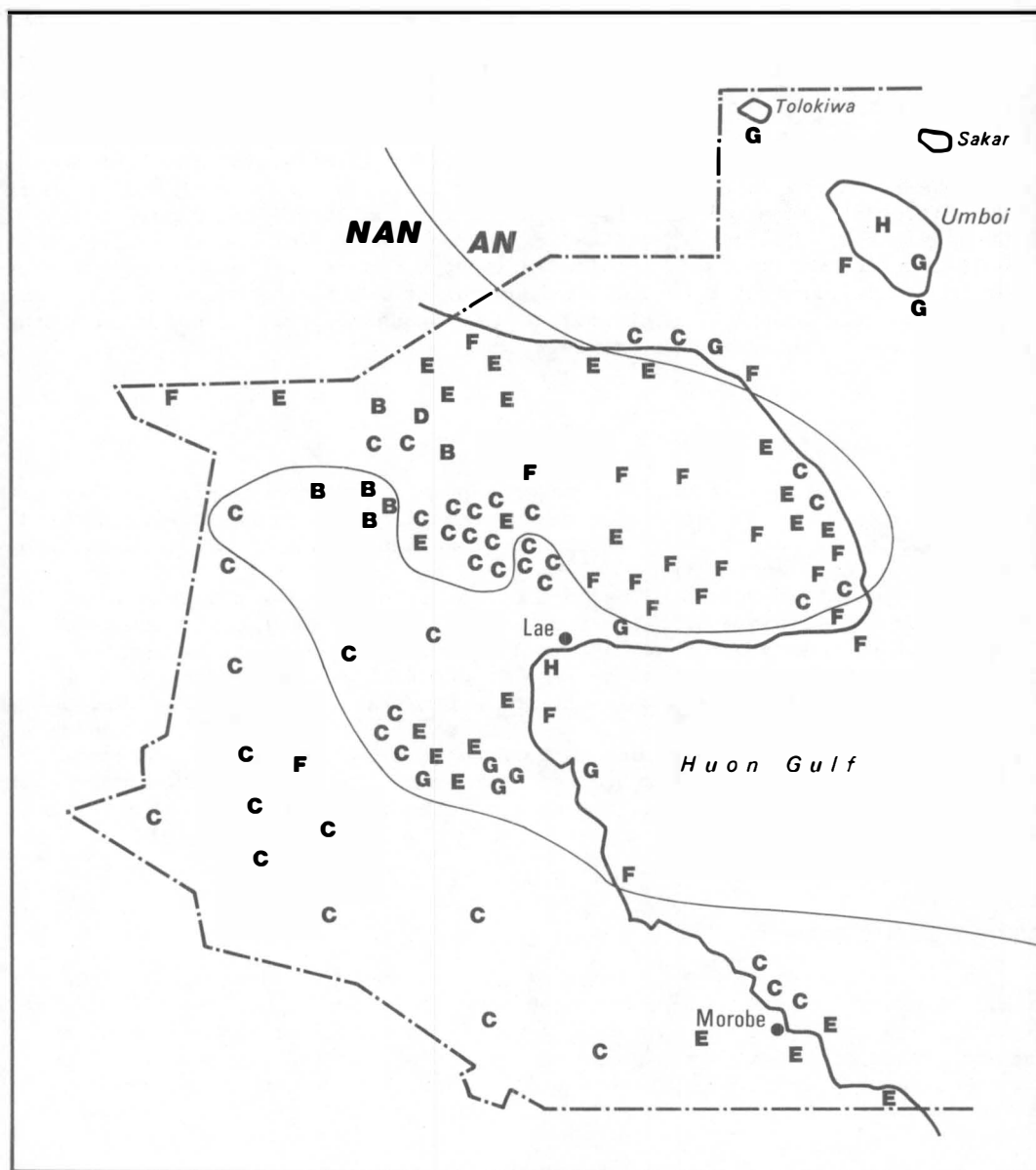
MOROBE COUNTING METHODS

An investigation of the numerals of all the Morobe languages has shown that the great majority of languages have few numerals and rely on some form of tallying for indicating higher numbers. A number of different types emerge, and the occurrence of these in the Morobe languages is indicated in Map 1. Type A, representing body counting systems found further west, is not found anywhere in the province. Types B and C have only two numeral terms, type C commonly

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Map 1: Distribution of counting types in Morobe languages

using tallying on hands and feet, while type B does not. Type D has three numerals and does not refer to hands and feet, while type E has three numerals followed by tallying on the hands and feet. Type F has words for the numerals *one* to *four* followed by tallying on hands and feet to a total of 20. Type G differs in having a distinct numeral for *ten*. There may also be a distinct numeral for *five*, or the word for *hand* may be used. Type H has words for both *ten* and 20.

There is a certain amount of consistency in the various language families: typical of the non-Austronesian families is a repertoire of two, three or four numerals followed by tallying on the hands and feet (types B to F). Austronesian languages of the Adzera and Buang families also tend to follow this pattern. Those languages with more extensive numeral series (types G and H) tend to belong to the coastal and island Austronesian languages of the Siasi family. The only exception is the non-Austronesian Kovai language of Umboi, which is surrounded by Siasi family Austronesian languages. There are, however, some Siasi family languages with very limited numeral series, for example Roinji and Nengaya, with only two numerals.

ANCESTRAL COUNTING SYSTEMS

Although the coastal and offshore Austronesian languages do tend to have more numerals than their non-Austronesian counterparts, they are deficient when compared with Proto-Oceanic and Proto-Austronesian, the inland Austronesian families remarkably so. For each of the proto-languages a complete decimal series of numerals has been reconstructed (e.g. Dahl 1976, Wurm and Wilson 1975). It seems then that in the process of culture contact, there has been a regression of the numeral series of the descendant Austronesian languages of north-east New Guinea rather than an expansion of those of the non-Austronesian languages in the area.

THE CULTURAL CONTEXT OF COUNTING

Clues to a possible explanation of this state of affairs can be gleaned from a consideration of how counting takes place in its cultural context in PNG. How do societies relying on simple tallying devices or few numerals cope with the social and economic demands of everyday life?

Recently a number of ethnographic studies have looked at this problem. In many traditional PNG societies, ceremonial exchange played an extremely important part in cultural and economic life. During many such exchanges, enumeration of totals was a necessary part of the process. However, an impressive visual display invariably accompanied presentations, and it was this which was more significant than the total itself. Many exchanges were competitive, and implied the need to give back as much as or more than what had been previously received. Thus the concept of relative quantity was usually more important than absolute measures. In these types of situations, tallying methods and poorly developed numeral series were adequate for handling all the necessary exchange procedures.

Common to many accounts of such exchanges is the importance of the concept of pattern. Large formal presentations may involve lines or heaps of wealth objects, for example laying out valued shells, or tethering pigs to stakes. Objects to be distributed may be tied to frameworks or specially prepared to maximise the impact of public display. Bunches of bananas in Adzera, for example,

were not counted prior to distribution, but mounted on a structure reaching the top of a coconut tree. The significance of this kind of structured visual display to counting behaviour was effectively summed up by Biersack (1982:30) when she stated: "relationship and hierarchy, not unit and iteration, are the sources of multiplicity".

Numbers may, in fact, sometimes appear to be redundant. Thune, working among the Loboda of Milne Bay, noted that while there exists in this society a counting system capable of reaching into the hundreds, counting and the enumeration of objects are unimportant in the culture and occur only rarely. Instead, he describes a non-numerical way of looking at the world emphasising relative rather than absolute measures. In such a situation the regression of numeral series could easily be imagined.

TRADE

If exchanges of this type were the only economic transactions existing in traditional society, the enquirer might be satisfied with this explanation. However, the Morobe Province is well known for intricate trading networks involving widely separate cultures. The trading interests of the Siassi islanders, for example, radiated like the spokes of a wheel to the far-flung corners of their traditional universe: east to New Britain, north to Umboi and Tolokiwa, west to the Madang coast and south to the Huon Gulf (Harding 1967). Each of these was the centre of trade with hinterland or other local groups. For people such as the Siassi whose life depended on trade, it would seem reasonable to assume that the possession of a complete decimal series would facilitate the trading process when, for example, calculating relative values and exchange ratios. And yet it is in just this type of cultural milieu that the regression of decimal numerals appears to have taken place. A detailed look at what took place during trading interactions may give some idea of the mathematical requirements of participating effectively.

Firstly, are we justified in using the word 'trade', with its connotations of profit, supply and demand, for the kind of ventures undertaken by the Siassi? As mentioned previously, ceremonial exchange is an important feature of Melanesian society, especially as a stage for politically ambitious 'big men', and ever since Malinowski's pioneering work on the *kula* expeditions of Milne Bay it has been recognised that trade in Melanesia also involves some of these ceremonial features. A great deal of the energy expended in *kula* shell exchanges, for example, appears to outside observers to have little justification in terms of economic benefit. Thus it might be argued that such overseas expeditions should be regarded 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 5-10 packets of sago, which in turn were exchanged at Sio or Gitua for 50-100 pots. These pots could then be transported to New Britain, where they yielded 5-10 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 appeared to yield a considerable profit.

In both trade and exchanges of the more ceremonial variety, however, the concept of profit requires close examination, and Strathern (1983) points out some qualifications to the generally understood meaning of the term. In 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. Similarly, although surplus 'profits' of *tambu* shell may be acquired among the Tolai, they tend to be stored for subsequent redistribution. And in the *kula*,

The category of 'profit-making' tends ... 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'.
(Strathern 1983:80)

In Morobe, too, the acquisition of profit does not seem to have been the fundamental 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. But it was not merely an accumulation for 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, the 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 in Mandok (Siassi). 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 "concepts of personal investments in people" (1983:181) were thus brought into operation as a means of establishing a group of people on whom a man could rely for support in various prestige-enhancing enterprises.

The importance of these trade partnerships is demonstrated by the strict etiquette observed by partners (Harding 1967:166). Hagglng 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.

CONCLUSION

In the kind of cultural and economic climate outlined above it is suggested that an extensive abstract counting system was not an essential prerequisite for successful participation in most aspects of traditional life. Even in the relatively sophisticated trading network of the Vitiaz Strait, computation and enumeration appear to have been secondary considerations, while social factors such as the maintenance of harmonious trade relationships were essential for ensuring the supply of vital commodities and expanding kin networks in the incessant pursuit of prestige.

While the possession of a complete decimal series of numerals would certainly not be a disadvantage, it seems that the redundancy of such cultural items could have led to their gradual atrophy. It is thus postulated that the numeral series of Austronesian-speaking arrivals in north-east New Guinea gradually regressed under the influence of indigenous social and economic systems, and that their counting methods came to resemble those of their non-Austronesian-speaking neighbours.

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