

CHAPTER 10

"CULTURAL" ITEMS OF BASIC VOCABULARY IN THE GULF AND OTHER DISTRICTS OF PAPUA

Part 1: Foodstuffs and Associated Agricultural Terms

T.E. Dutton

10.0. Introduction

10.01. Aim

Basic vocabulary lists¹ generally used by linguists for language survey and classification work in Papua New Guinea usually include a number of what are known as "cultural" items. These are items which refer to such socio-economically important items of material culture as the common foodstuffs, garden terms, animals, stimulants, weapons, ornaments, art forms, items of clothing, and perhaps others.² They form a special subset within basic vocabulary lists because they are generally regarded as being "probably borrowed", and therefore to be

¹In this paper I shall assume that readers are familiar with the nature and use of basic vocabulary lists. For those who are not may I refer them to references and discussion in other chapters of this volume and especially to Laycock (1970) who gives a comparison of those frequently used for survey work in Papua New Guinea.

²Normally the decision to regard this or that item as "cultural" in this sense is based on linguistic and/or other criteria. For example, as will be indicated below, if it is known that certain foodstuffs are non-native to an area (as is the case of many of those discussed in this article) then it is highly likely that the names of those items will be transmitted along with the items themselves. However, this does not mean that the name always remains the same for other factors may intervene (e.g. word taboo) to change it thereby making the task of historical reconstruction more difficult.

treated especially carefully, if not excluded altogether, in calculating percentages of shared cognates between communalects as indices of genetic relationship between them.¹ Yet precisely because they are "probably borrowed" they are of particular interest as potentially important sources of historical information about contacts within and between languages and, eventually, about culture history.

In this paper I begin the study of the form and distribution of these items throughout languages of Papua New Guinea and elsewhere with a pilot study of a subset of them to see what sorts of conclusions can be drawn from the presently available material in languages throughout the Gulf and other districts of Papua.² As such the paper can only be regarded as exploratory and preliminary in nature though it is hoped it will provide useful guidelines for determining other more detailed ones later.

10.02. The Items

Five foodstuffs - sweet potato, taro, yam, banana, sugarcane - and two associated agricultural terms - garden and fence - are discussed in this paper. The first set represent the principal staples and/or supplementary food sources (depending on climate and excluding sago, terms for which have not been systematically elicited to date) throughout Papua.³ Of these sugarcane⁴ and bananas of the *Australimusa* group⁵ are thought to be indigenous of New Guinea, the others being introduced at various times - taro, yam and bananas prehistorically at a very early period from South-East Asia, and sweet potato very recently from Eastern

¹See again Laycock (1970) for a discussion of the problems associated with eliciting this kind of vocabulary and for comments on the reliability of individual items.

²The decision to restrict this paper to this area will of course mean that complete patterns of distribution may not be evident and that the full contribution of studies like this to arguments about pre-European agriculture, and the introduction of sweet potato in the central highlands of New Guinea in particular, (see for example Brookfield (1964), Brookfield and White (1968), Watson (1964a; 1967), and Sorensen (1972)) cannot be made. However I think it is justified in terms of the present volume and that Papua is sufficiently large to show up the main problems and results that can be expected in larger scale studies.

³See Lea (1970) and Lea and Ward (1970).

⁴See Warner (1962) and Wormsersley (1972a).

⁵See Powell (1970) and Brand (1971).

Indonesia where its appearance is thought to be associated with the arrival of the Portuguese in the sixteenth century.¹ Each of these foodstuffs comes in numerous horticultural and folk varieties² and, depending on area, most, if not all, are today cultivated in enclosed gardens protected from domestic and wild animals by some sort of barricade or "fence" of fallen logs, upright stakes, and/or plaited pitpit (*saccharum robustum*). Historically, however, the practice of gardening cannot yet be tied to any specific foodstuff. All that is known at present is that a technologically quite advanced system of gardening (compared with simple migratory shifting agriculture) was being practised in swamplands in the central highlands of New Guinea as far back as 2300 B.P., but it is not known whether this system was associated with the introduction of new crops.³ Consequently in examining the linguistic evidence we cannot assume that names for garden and fence were introduced in the same way as those of the principal foodstuffs sweet potato, taro, yam and banana, nor can we assume that introduced names will be retained or have the same referent through time⁴ - these are questions which can only be judged from the linguistic evidence itself.

¹See Barrau (1955, 1963, 1965), Brand (1971), Brookfield (1964), Brookfield and White (1968), Bulmer (1964), Golson (1972), Powell (1970), Sorenson (1972), Yen (1971, 1972), Watson (1964a, 1965, 1967), and Wormersley (1972a).

²See, for example, Williams (1928:116, fn.1), Sorenson (1972:358), Strathern (1969:193), and Brookfield (1964:21).

³See Golson (1972), Golson *et al.* (1967), and Powell (1970).

⁴In fact we know from other studies that name-switching between different varieties across languages and even between different genre within the same language is to be expected. See for example, Merrill (1946:221-27; 1937) and Chowning's (1963) study of Proto-Melanesian plant names in which (p.43, fn.3) it was pointed out that "taro is called completely separate names in garden spells and everyday useage...(and) that a Proto-Melanesian word for planted taro tops, *ufe is reflected in a number of Melanesian languages in which the words for taro itself are quite unrelated."

10.03. The Materials

Vernacular equivalents of the above items were obtained in as many languages throughout Papua as possible. Most were kindly supplied by linguists and others working in the area¹ and the remainder were obtained from written sources, notably dictionaries and early Government reports.² Except for a few cases the recorded forms are those obtained as part of basic vocabulary lists during brief contact with indigenous informants. Consequently each form must be taken to represent the currently most common term for each cultural item. More importantly no attempt was made to elicit names for different botanical or horticultural varieties (except for *yam* where forms for the two common varieties *dioscorea alata* and *dioscorea esculenta* were often elicited) or to record folk taxa, or to search for related forms in the languages being recorded. Thus there is considerable variation in both the quality and coverage of the materials employed with the result that there are likely to be significant 'holes' in the pattern of distribution of many of the apparent cognates.

10.04. Area and Languages

The area under consideration is inhabited by peoples speaking basically two distinct language types - Austronesian and Non-Austronesian (or Papuan), which are hereafter symbolized as AN and NAN respectively. The AN-speaking peoples are now to be found scattered around the coast east of Cape Possession and on the islands of the Milne Bay District, excluding Rossel Island in the far east, which is occupied by speakers of the NAN language, Yele. NAN speakers occupy the remainder (including Rossel Island just noted) which ranges from low-lying swampy deltas

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²See Brown (1968), Dutton (1969; 1970; 1971), Franklin (1968; 1971), Healey (n.d.), Lister-Truner and Clark (n.d.), Saville (1935), Voorhoeve (1970a; 1970b); Z'Graggen (1969) and English-Ubir Word List (n.d.).

around the Gulf of Papua through savannah grasslands and foothills up to the very mountainous central cordillera of the island. These people speak 160 languages, most of which belong to thirty-four families and eighteen stocks of the Trans-New Guinea Phylum which itself includes 62.15%¹ of all NAN languages of Papua New Guinea.²

The AN languages number about fifty including lingua franca, which are related to AN languages.³ These languages are closely related to one another and to the languages of most of the Pacific.⁴ They have been most thoroughly studied by Capell (1943; 1969) who groups them into eleven arealunits (hereafter referred to as areas I-XI) covering two structural subtypes, AN₁ and AN₂.⁵ Practically all of the AN languages of Papua are of the former subtype which differs from the latter in being phonologically and grammatically more akin to most NAN languages of south-eastern Papua. Only one group of AN languages in Papua belongs to the AN₂ subtype. This group includes Kiriwina, Gawa, Murua, and Nada and perhaps the language of the Amphletts Islands of area IX.⁶ The differences between and within these subtypes and their geographical distribution leads Capell to suggest that contemporary AN populations originated in various parts of the Indonesian archipelago and migrated into Papua in three main 'movements': I (from Borneo); II (from Central Celebes); III (from Java, Sumatra and the Malay Peninsula), where they came into contact with three prehistoric regional languages in Papua - North East Coast (NEC), South-Eastern (SE), and Central (C). It remains to be seen whether or how well, these postulated regional languages correspond with present-day NAN languages and language families in South-East Papua.⁷

¹See Wurm (1972:165).

²Excluded are six isolates and two unclassified languages. See Appendix B. For more details on the Trans-New Guinea Phylum see McElhannon and Voorhoeve (1970) and Wurm (1972).

³The exact number of AN languages is not yet known because of the existence of numerous dialect chains which have not yet been fully described.

⁴See, for example, Dyen (1965) and Capell (1969:17-25).

⁵See Capell (1943:5-7; and map p.8).

⁶See Capell (1969:126-28).

⁷In Dutton (1969:13) I noted that there appears to be little structural similarity between the Koiarian Language Family and Capell's (1943) Central Regional Language but that this does not necessarily negate his suggestion.

All languages are listed and codified in their areal divisions, stocks and families in Appendix B and displayed on Map 7. Phonological characteristics of the two types - AN and NAN - are sketched in Appendix A.

10.05. Method

Once the data were assembled for each item the vernacular equivalents were scanned and grouped into sets of apparent cognates in the following manner:

Two forms were regarded as apparently cognate if corresponding sounds in forms with the same meaning differed from one another in no more than one of the following respects:

- (a) for consonants: point and manner of articulation;
- (b) for vowels: tongue height and forward or back position.

An absence of a sound was counted as only one difference (provided the remainder of the form corresponded well with its counterpart) and such minor modifications of sounds as prenasalization, devoicing etc. were ignored. The rules were also relaxed for final syllables of words of more than two syllables.¹

Subsequently these sets were refined on the basis of observed similarities between sets in different items (or as I shall henceforth say, across item boundaries) and on the basis of my experience of the structures of the items.²

The application of these principles provided sets of forms which are all very similar but which must necessarily serve as a starting point for this kind of investigation until such times as more is known about sound laws in related languages of Papua.³ Any vernacular forms which did not seem to belong to any of the established probable cognate sets were listed together at the end of each item as "isolates".

¹This was done to avoid counting possible hidden suffixes and/or elicitation errors which are quite common on the ends of words because of the recorder's unfamiliarity with the language and/or the informant's unfamiliarity with the elicitation technique.

²For example, it soon became apparant that some forms were bi-morphemic although initially this was not evident from the way the forms are generally recorded. The first hints of this were found in those sets involving proto-Austronesian reflexes, and many such items were identified - see section 10.22.2. However, there are still many areas of uncertainty, e.g., see sweet potato: set 1 below (section 10.13.).

³The only sound laws that have been established so far are those for the Ok Family by Healey (1965). However, Voorhoeve (1970b) gives some notes on those in the Suki-Gogodala Stock as does Lloyd for Angan in Chapter 2 of this volume.

Having thus established apparent cognate sets and isolates for each item the sets were compared with reconstructions that have been established or proposed for some of the items for different parts of the Pacific by Capell (1943), Chowning (1963), Dempwolff (1934), Dyen and McFarland (1970), and Grace (1969).¹ The results of these comparisons are set out in the next section which contains all the evidence and notes necessary for the discussion that follows in the section 10.2.

10.06. Conventions

In setting out and discussing the results of this study the following conventions and procedures have been adopted.

All vernacular forms have been recorded as obtained from the sources where the transcriptions may vary from approximately phonetic to established phonemic. No attempt has been made to regularise these or to indicate their orthographic status in any way.

In the appendices these forms are listed on the left-hand side with language information on the right coded in the following way and according to the listing of languages given in Appendix B. Language isolates, unclassified languages and NAN language families are given in capitalised three or four letter abbreviations (e.g., KOI = Koiarian Language Family), while AN areas are given in capitalised roman numerals (e.g., III = AN area three). All languages are coded in small, single letters and separated from the language family (or areal unit for AN languages) to which they belong by a slash, thus /, e.g., KOI/a = the language 'a' of the Koiarian Language Family, i.e., the Koita language. Dialects are coded in small roman numerals following the language code, KOI/bii = dialect 'ii' of language 'b' of the Koiarian Language Family, i.e., the western dialect of the Koiari language of the Koiarian Language Family, or for areas where this information is not available "tribal" or village names are given in brackets, e.g. Tur/Dugeme = the Dugeme 'tribe' of the Turama-Omatian Family. The only exceptions to this are the two dialects of Maisin which are coded MAIS(C) and MAIS(K) for the coastal and inland (or Kosirava) dialects respectively. Other more general conventions,

¹The actual status of these forms, i.e., established versus proposed or suggested, is not crucial to this study; they merely provide useful summaries of data found in the Pacific against which the items in this study can be compared.

including some already mentioned are:

KOI	code for language families, isolates, and unclassified languages (see Appendix B)
I-XI	code for AN language areas (see section 10.04. and Appendix B)
b	code for language name (see Appendix B)
ii	code for dialect (see Appendix B)
/	separates language and dialect code from language family code
, or /	(elsewhere) separates alternative cognate forms; or
-	(probable) bound morpheme boundary
major set	cognate sets distributed over a wide area and across major linguistic boundaries (see section 10.21.)
minor set	cognate sets distributed within member languages of the same stock or over neighbouring languages not necessarily of the same stock (see section 10.21.)
isolates	cognates not belonging to any cognate set and limited to one language (see sections 10.05. and 10.21.)
[]	(in cognate sets) distinguishes the marked (or special) case from the unmarked (or normally elicited) case, e.g. in the lists for 'yam' square brackets are used to distinguish the sweet yam (d. <i>esculenta</i> or <i>taitu</i> in Hiri or (Police) Motu from the more generally elicited ordinaty yam (d. <i>alata</i> , or <i>maho</i> in Motu).
PAN	Proto-AN, a general term
*	Established or proposed reconstruction (see section 10.05.). Wherever particular forms are quoted these will be followed by the source reference as follows: MN-Chowning; EB (and others)-Grace; PAN-Dempwolff; PAN-Dyen; IN-Capell (see section 10.05.)
PN	Polynesian

- *BURU tentatively reconstructed proto-form for which there
is no previous reconstruction (see section 10.24.)
- _____ (i.e., underlining) identifies those parts of
multimorphemic forms which are regarded as cognate
with other forms listed in the same set
- q.v. *quod vide*, 'which see'
- Central and South-Eastern Papua that area approximately east of Cape Possession
- Western Papua that area approximately west of the Kikori River in
the heel of the Gulf of Papua

10.1. RESULTS: Cognate Sets Per Item

10.11. Garden

1. moro ¹	KIW/b	<u>dzuwari</u>	} KOI/d	
muro	MAN/a,b	<u>dzuwai</u>		
bua	BIN/a	<u>dzuru</u>	} KOI/f111	
buuro	BIN/e,1,j,k,l,m	<u>dzaure</u>		
pure	BIN/f,g,h,	<u>dzura²a</u>	BIN/n	
baburo ²	BIN/i	ware	KOI/bi,ci,cii,ciii,cv	
isiaburo ³	BIN/m	bu:	GOI/e (karukaru)	
kopura ⁴	} VII/c	vu:	KOI/civ	
kupura			mu: }	KOI/e
upura			mue }	
kofura	} DAG/d	<u>forova oti</u>	ELE/b,c	
ne ⁵ ufurana			<u>oru(uta)⁷</u>	ELE/c
dzuwore ⁶	KOI/f1	<u>faura</u>	TAT	
dzuwora	KOI/f111	<u>vo.ore</u>	KWA/a	

¹Cf. related forms in fence: sets 4 and 16; sweet potato: set 10; yam: set 4; taro: set 38.

²ba-. Cf. taro: set 2.

³Cf. isia forms in sweet potato: set 10 and taro: set 13. Note that the word for sweet potato in BIN/m is, however, kaire utua or kairu kuta - see sweet potato: set 3.

⁴ko-, ku-, u-. Cf. similar forms in, or discussion relating to: fence: sets 1,2,3c, 4,6, and taro: set 14, which in turn are related to so-, sa-, a- forms found in garden: set 6, sweet potato: set 2, and taro: sets 7,14,16, and eventually to kau forms found in sweet potato: set 6 and yam: set 2. Cf. also the common initial element ko-, ngko-, ke-, ka-, go-, nggo-, ngga-, oka- in the following given by Watson (1968:273) for *Pureraia lobata* and '(edible) tubers' in languages of the central highlands of New Guinea:

Term	Gloss	Location or Language
kórono	<i>Pureraia lobata</i>	Enga-Mendi
ngga-oka-	<i>tuber, swollen storage root</i>	Medlpa-Kakoli
okamapamp, okamoi	<i>Pureraia lobata</i>	Medlpa
góruma-nggónduma	<i>Pureraia lobata</i>	Chimbu dialects
kohena	<i>Pureraia lobata</i>	"near Goroka"
kenangi, kagomba	<i>Pureraia lobata</i>	Watabung
ngko-ko-	<i>edible tuber (?)</i>	Kainantu languages
kópitu, etc.	<i>cultivated Pureraia lobata</i>	Kainantu language
ngkó ² hi		

Strathern (1969:189 et passim) points out that ok is a primary taxonomic order on the same level as me taro and op yam which includes sweet potato, *pueraria lobata*, and other related vines in Medlpa but notes (p.193) that "oka mapumb (*pueraria*) may be contrasted with oka ingk (true oka, i.e., sweet potato) or with oka alone, which, when unqualified, always refers to sweet potato".

If all these are related to kaukau, a common form for sweet potato throughout many languages of the Pacific it must have spread very rapidly throughout Papua New Guinea and its impact on cultures in all corners of Papua is evident from the variety of present-day forms in which it is involved.

Garden

⁵Cf. related forms in garden: set 2 below.

⁶The dzu- element in these forms is probably related to lovi which appears in Central Papua as both garden (q.v. set 2) and yam (q.v. Isolates).

⁷For related sets to uta see fence: set 1, sweet potato: set 3 and yam: set 10.

2.	e	EKU/a
	<u>e</u> gelo ¹	BOS/b
	<u>i</u> genai	BOS/c
	e	HIG/a
	ee (<i>greens</i>) ²	HIG/b
	emaapu	HIG/b
	e (<i>greens</i>)	HIG/d
	ɛ	HIG/d
	<u>e</u> i dabu ³	POR
	<u>e</u> gada	GOG
	<u>i</u> ga	SUK
	<u>e</u> ge	PAH/a
	<u>g</u> edup	ETF/d
	<u>s</u> ega	II/bv,bvi,bvii, bviii,bxvi
	<u>n</u> ɛ ufurana ⁴	DAG/d
	<u>e</u> gak	DAG/a11
	<u>ɛ</u> ba?a ⁵	II/Yoba

¹These forms suggest that they derive from something like *(n)te ± other forms which at some time probably specified the particular type of garden. Evidence for this can be seen in the e gelo and igenai forms which have relatives in present-day words for sweet potato (q.v. set 2), taro (q.v. set 21), and yam (q.v. set 13) in other languages of Papua. Reflexes of *(n)te are widely distributed in two main areas of Papua - an arc connecting the Southern Highlands and the Trans-Fly via the Turama River and a small area of the south coast of Papua including AN and NAN languages.

²In Kewa (=HIG/b) emaapu refers to a new, that is, productive garden while ee refers to a garden which is old, that is, one with only *greens* in it. For maapu see set 3 below.

³dabu. Perhaps related to yapu and similar forms given in sugarcane: set 4.

⁴This form appears to be made up of at least two elements: u- and fura related to forms discussed in footnotes 4 and 1 of set 1 above respectively.

⁵ba?a. See set 3 below.

3. <u>emaapu</u> ¹	HIG/b
<u>ma</u> ⁷ a	I/f
<u>eba</u> ⁷ a	II/Yoba
<u>map</u> (<i>vegetable</i>)	HIG/c
<u>batimapo</u> ²	KIW/dii
<u>batimabu</u>	KIW/diii
<u>sopapo</u> ³	ETF/b
<u>homehabo</u> (<i>banana</i>)	ESF/a
<u>apa</u>	MAB
<u>aba</u>	II/cix
<u>ava</u>	II/cvii
<u>watihuai</u>	KIW/dii
<u>hemo</u>	WKU/a
<u>hemu</u>	WKU/c

¹The common element here shows a number of variants widely distributed in western and south-eastern Papua. Since these variants are found in both NAN and AN languages they must represent borrowings in one or the other though without further evidence it is not possible to decide which is the borrower. Irrespective of that, however, the distribution of these elements raises interesting questions about the contact between NAN and AN languages across the Gulf of Papua which will be discussed further in section 10.2.3. Finally, judging by the *emaapu* and *homehabo* examples these variants seem to derive from some descriptive element which refers to the contents of gardens. Cf. footnotes 1 and 2 to set 2 above.

²*bati-*, *wati-*. No apparant cognates have yet been located in the materials presently available.

³*so-*. See footnotes 4 to set 1 above.

4. <u>kaie</u> ¹	BOA/a
<u>kae</u>	BOA/a _{ii} , a _{iii}
<u>raveaka</u>	BOA/b _i
<u>ravaka</u>	BOA/b _{ii}
<u>gaihyq</u>	IPI

¹These forms occur in two widely separated areas of western Papua - one (represented by BOA) around Lake Murray in the west and one (represented by IPI) in the heel of the Gulf of Papua.

5. <u>madava</u> ¹	MAI/e (except i _{ii} , v _{ii} , v _{iii})
<u>masau</u>	VIII/e
<u>masava</u>	VIII/f _i
<u>masawə</u>	VIII/f _{iii}
<u>mado</u>	II/d
<u>nada</u>	KWA/b

Garden

¹These forms occur in both AN and NAN languages of south-east Papua and therefore must represent borrowings in one or the other, though on present evidence it is not possible to decide which is the borrower.

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|----|----------------------------|-------|
| 6. | kukop ¹ | MOR/c |
| | gogosu | UBF/a |
| | kogau (<i>root crop</i>) | ESF/a |

¹These three forms occur in widely separated areas of western Papua. They may be bimorphemic, e.g. ku-, ko-, go- (see footnote 4 to set 1 above) and kop, gosu, gau possibly related to sweet potato: set 6 and others.

- | | | |
|----|-------------------|---------|
| 7. | ilai ¹ | DAG |
| | elai | DAG/eii |
| | harai | YAR/d |

¹These forms occur in neighbouring NAN language families of south-east Papua.

- | | | |
|----|-------------------|-------|
| 8. | ówe: ¹ | TIR/b |
| | owa | DAG/f |

¹These two forms occur in widely separated NAN language families - one (TIR) around the mouth of the Fly River in western Papua and the other in south-east Papua.

- | | | |
|----|------------------|-------------|
| 9. | uma ¹ | II/a,bx; PM |
| | umo | KIW/c |

¹These two forms are reflexes of *quma *garden* (OC-Grace) or (h)uma *garden* (IN-Capell). The occurrence of related forms in NAN and AN languages of western and south-east Papua parallels that of other sets of forms in this data. In this case, however, umo must represent a borrowing into KIW/c from some AN source. See discussion in section 10.2.

10.	meru ¹	MOR/1
	mer	MOR/h
	berar	MOR/g
	pərih	TIR/a
	pari	KIW/a111,c
	pa [?] ea	KIW/e111
	meni	} PAW
	peni	
	məroi	

¹One of the few sets with cognates in Pawaian (PAW).

11.	lovi ¹	KOI/c111
	<u>yo</u>	KOI/d11
	<u>yo</u> si [?] a	} KOI/f11
	<u>dz</u> usi [?] a	
	<u>dz</u> uasa	KOI/f1
	<u>dz</u> uwari	} KOI/d
	<u>dz</u> uwai	
	<u>dz</u> uru	
	<u>dz</u> aure	
	<u>dz</u> wore	KOI/f1
	<u>dz</u> ura [?] a	} KOI/f111
	<u>dz</u> wora	

¹lovi. Also = *yam* in KOI/cii. Cf. *yam*: Isolates.

12.	ye [?] e	KOI/a,b11
	ve:	KOI/b11
	he:	
	e:	
	e [?] e	KOI/cvi
	?i [?] a	KOI/e
13.	mea [?]	MAI/a
	mea	MAI/b
	meia	
	mɛya	MAI/c1
	peaka	MAI/d
	beaka u [?] ara	YAR/a
14.	kwamɨnga	ANG/1
	wawɨnya	ANG/b
	wamgana	ANG/k
	wamna	ANG/g
	wamnga	ANG/l
	wangwa	ANG/f

Garden

- | | | |
|-----|--------------------------|--------------------------|
| 15. | ndau
ŋaŋn | MOR/a,b,e
ETF/c |
| 16. | dou(a)
topa
doba | MAI/ci
YAR/a
YAR/b |
| 17. | *xü }
*xu }
*yaküp | AWY/a-d
AWY/e-f |
| 18. | *yoŋ
*loŋ | OK/a-d
OK/e-1 |
| 19. | sunu
hono | TUR/b
KAI |
| 20. | upi ¹
tupi | DAG/c
DAG/d |

¹ Reflexes of *huvi *yam* (MN-Chowning) and similar reconstructed forms given in *yam*: set 10. See discussion in section 10.2.

- | | | |
|-----|---|--|
| 21. | araya ¹
yadaɣa
ara
araa | II/bi,bii,bxvii,ciii
II/bv
II/ci
II/civ |
|-----|---|--|

¹Cf. fence: set 3a.

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|-----|----------------------------|----------------------|
| 22. | ·ulahi }
ulai }
iula | II/Labu
II/cv,cvi |
| 23. | əloubada
eowa | I/e
X/d |
| 24. | begati | MAIS; VIII/e |

25. nao DAG/ai,a11,b,g
26. kurio KIW/g,f
27. amara¹ DAG/f;DOG

¹Cf. sweet potato: set 9; yam: set 25.

Isolates

davito	UBP/b	ifuabi	BOS/a
gi	TEB/a	iky(woi)	BOS/b
guto	TEB/b	ko.oto	GOI/d
dido	TEB/c	iapa	MAI/e111,v11
odubo }	ELE/a	ibaga	MAI/ev111
oruhu }		tako	II/Bina
yawelei	GOI/a	nuku	III/a11
gadini	WAI/(ex-English)	gana ²	III/a11
avas1 } ¹	GOI/c	sipi	VII/b
adas1 }		itam	VIII/b
in-daiga	GOI/d	regai	VIII/c
digaba	MAI/a	vamoka	II/b111
ewo	MAI/ex11	waia ³	YAR/a,c
yabotərə	ROS/a	goi }	MAI/c11
beda	GOG	goe }	
ye1yo1	TIR/d	umuge? }	ANG/j
aluaupi	ETF/a	umge? }	
ba:nt	MOR/d	yawaisi	BIN/1 (Korala)
narake	MOR/f		

¹Cf. sweet potato: Isolates; taro: set 16.

²Cf. fence: set 3d.

³Cf. yam: set 16.

Fence

10.12. Fence

1. a) $\begin{array}{l} \text{uta}^1 \\ \text{uda} \\ \text{kh}\text{ɔ}^1\text{th}\text{ə}^1\text{f} \\ \text{kota} \\ \text{ʔoha} \\ \text{fota} \end{array}$ } BOA/a,b
PAH/a
MAN/a
MAN/b
DAG/b
- b) $\begin{array}{l} \text{t}\Lambda\text{k}^h \\ \text{ta} \\ \text{*daam} \end{array}$ TIR/b
GOG
OK(PMO)

¹This is a problematical set. If subset (b) is regarded as related to subset (a) then there appears to be a case for arguing that the forms in subset (a) (and similar forms in sweet potato: set 3 and yam: set 10) are bi-morphemic i.e., they consist of some ko-like element (Cf. footnote 4 to garden: set 1) plus some ta- like element corresponding to that in subset (b). If subset (b) is not regarded as related to subset (a) then there is no problem.

Distributionally subset (b) forms fall together with the uta, uda (BOA/a,b) and khɔ¹thə¹f (PAH/a) forms of subset (b) in a group around the Fly River of western Papua. The remaining members of subset (a) are to be found in south-east Papua where they occur in two well separated NAN language families.

2. $\begin{array}{l} \text{anop}^1 \\ \text{ʔona} \\ \text{gonā}^1\text{ʔa} \\ \text{gonaa}^1\text{ʔaa} \\ \text{onāga} \\ \text{h}\text{ɔ}^1\text{h}\text{ɔ}^1\text{nu} \\ \text{gy} \\ \text{une}^1 \end{array}$ DAG/c (Kanamara)
DAG/d
DAG/ei
ANG/l
DAG/f
YAR/d
TEB/b,c
ANG/j

¹Another problematical set with the initial syllables suspiciously like the ko- forms already referred to in footnote 4 of garden: set 1 above. Distributionally the variants fall into four areal subsets which are very widely separated. One of the few sets which shows connections between the Angan and other languages.

3. a) $\begin{array}{l} \text{gara}^1 \\ \text{kar} \\ \text{yala} \\ \text{yara} \\ \text{gaya} \\ \text{gaea} \\ \text{bolibo} \\ \text{kara} \end{array}$ } KIW/e111; IPI; KOI/c; DOG; VIII/e
ETF/d; MAB
KOI/a
II/b111, bv
MAI/a
ESF/a
KIW/a, b, c; ETF/a, b; KAI; POR; WAI
- tigala

- | | | |
|-------|--|---|
| 3. b) | arak ^h e
arak
ara }
ala
arana | MOR/a
MOR/b,c
KIW/c,d,f,g;TUR/a;PM;II/a,bviii
I/e |
| 3. c) | koro
kora
oro
gogola ²
orabo
anihora | ELE/a
ELE/c
YAR/a
II/Bina
MAI/e(iii,vii,viii,ix)
GOI/c |
| 3. d) | gana

kana
gana (<i>arm/leg band</i>) | II/a,bi,bii,bvii,bxvii,Labu,Magori;III/a11;
VII/b;X/d;DAG/a11;MAI/e (except iii,vii,
viii,ix)
II/ci,ciii,civ,cv,cvi,cvii,cix
II/a |

¹This set is taken as consisting of four related subsets 3a,b,c, and d although there is some doubt about the relationship of subsets b,c and d to a. This doubt arises principally from Capell's (1943:163/a) suggestion that the ara-type forms are related to pala fence in Indonesian (and by extension to the reconstructed form *mpaa fence given by Grace (1969)) for which he quotes the evidence of bala fence in Keapara (=II/b) and ni-aʔ fence in Atchin, although he notes that reflexes are "rare and rather irregular". But there are several arguments against this suggestion. One is that p/b in Keapara do not usually correspond to Ø in the closely related Motu and Sinagoro of the same. Another is that corresponding sets of kara, kora, and ara-type forms are found in very distant NAN languages of New Guinea. Consider, for example, the following from NAN languages of West Irian (kindly supplied by Dr C.L. Voorhoeve): kar, har (Madang Phylum), kor (Sause), kor (Uria), ar (Mawes), erä (Tanah Merah), ärä (Sentani-West), ele (Sentani-Midden), älä (Sentani-Oost), ärä (Nafri). Finally, better correspondences for pala are to be found in the wara, varaba, obara etc. given in set 4 below.

Thus the evidence seems to point to sets 3a,b and c being continuations of a single protoform which was something like kara and perhaps NAN in origin. Whether subset 3d forms represent continuations of this also is doubtful but will be regarded as so for present purposes.

Distribution-wise members of subsets 3a and 3b pattern into eastern and western branches separated by a gap around the Gulf of Papua. They are to be found scattered around the coast but with some members inland up the Turama River and in related languages of the Torres Straits. The eastern branch members occur in South-east Papua scattered around the coast and the immediate hinterland. Members of subset 3c on the other hand are to be found scattered along the south coast between the Gulf of Papua and Mailu Island. That is, they fill the gap separating the members of the two areal branches of subsets 3a and 3b so that there is a continuous distribution of cognates between east and west. Subset 3d forms are locally distributed in neighbouring NAN and AN languages of south-east Papua and are in complimentary distribution with the other subsets.

²go-. Cf. garden: set 1, footnote 4.

Fence

4.	<u>obara</u> ^{1,2}	KWA/c (extinct)
	<u>xambaro</u>	BIN/h
	<u>bala</u>	II/c
	<u>wara</u>	KIW/ei1;KOI/b
	<u>varaba</u> }	MAI/b,c
	<u>waraba</u> }	VIII/b
	porotuto <u>varanue</u>	

¹Reflexes of *mpaa fence (EB-Grace) - see footnote to set 3 above. The variants are widely but sporadically distributed. Most are to be found in south-east Papua in NAN languages but one, wara, occurs rather interestingly in western Papua amid kara-like forms regarded as non-cognate (see set 3a above) in neighbouring dialects of Urama-Gope (KIW/e).

²o-, xa-. Cf. ko- discussed in footnote 4 to garden: set 1 above.

5. a)	<u>vero</u> ¹	} KOI/di,fi
	<u>verε?ε</u>	
	<u>veru</u> }	KOI/di1
	<u>yeru</u>	
	<u>bε:ra</u>	KOI/fi1
	<u>veire</u>	KOI/fi11
	<u>vabele</u> ²	KWA/a
	<u>yabili</u>	KWA/b
	<u>fabe</u>	TEB/c
	<u>faε</u>	KOI/di
	<u>mafe</u>	EKU/a
	<u>mafi</u>	WKU/c
	<u>pape</u>	HIG/a
	<u>paape</u>	HIG/b
	<u>ili</u>	BOS/b
	<u>pε:r</u>	TIR/a
	<u>pari</u>	ETF/a
	<u>berar</u>	MOR/g
5. b)	<u>naport</u>	ANG/h
	<u>bore</u>	KOI/e
	<u>bolibo</u> tigala	ESF/a
5. c)	<u>benali</u>	} PAW
	<u>peni ariloi</u>	
	<u>xarida</u>	
	<u>gari</u>	
	<u>gariwan</u>	
	<u>keri(zi)</u>	
	<u>keri</u>	GOI/e
		DAG/c,ei;VII/c
		DAG/ei1
		MAIS
		VIII/e

¹These forms cluster into three subsets which are quite consistent within themselves. The connection between them, however, depends on a vowel change from i/e to o/a and a consonant change from b/p to k/g. In each variants cluster again into eastern and western areal subdivisions, linked, if the subsets are really related, by sporadic occurrences in inland languages along the central mountains inland of the Gulf of Papua (notably ANG/n and PAW).

²va-, ya-, fa-, ma-, pa-. Probably *taro*. Cf. *taro*: set 2.

6.	<u>reidza</u> ¹	KOI/di
	redza	KOI/e
	<u>kurita</u> ²	ANG/b

¹One of the few items showing cognates in Angan (ANG) languages.

²ku-. Cf. footnote 4 to garden: set 1.

7.	<u>puya</u> ¹ }	BIN/i,k
	<u>puga</u> }	
	<u>ofua</u> }	BIN/m
	<u>opua</u> }	
	<u>youka</u> }	BIN/l
	<u>wouka</u> }	
	<u>mbwa</u>	ROS

¹One of the few items showing cognates in the Rossel Island (ROS) language.

8.	*kuk	OK(PLO)
	<u>kokiau</u> ?u	BAI

9.	lova ¹	ELE/c
	dova	YAR/c
	doa	MAI/d

¹One of the few items showing cognates from the Gulf of Papua (ELE). Cf. *yam*: Isolates fn.4.

10.	tatale ¹	UBF/b
	tasa	ANG/e

¹One of the few items showing cognates in Angan (ANG) languages.

Fence

11. magu¹ PM;TUR/b

¹The occurrence of this form in TUR/b in western Papua probably represents a borrowing from Hiri (or Police) Motu or an elicitation error involving the same language.

12. tin } DAG/a
 sin }
 tsin } DAG/b
 ti } DAG/g
 isi }

13. *wuut/T OK(PLO)
 *watü OK(PMO)

14. rət MOR/e,f
 ruod MOR/1

15. temerA } GOI/c
 tamio }
 lememek } GOI/a
 domeve } GOI/d

16. furu¹ VIII/f1;BIN/m
 fuř VIII/f11,f111
 furo BIN/m

¹Cf. garden: set 1.

Isolates

ripa DAG/c
 nabia MAN/b (Uder1)
 kigeta MOR/h
 ludu WKU/a
 kepo HIG/b
 lələha I/f
 daba II/bv1
 au II/bxv1
 mayata II/bx

10.13. Sweet Potato

1. mosela ¹	YAR/a11(Sth);II/bv1,bv11
mosera	YAR/a(Nth);b,c;BIN/l;MAN/b;MAI/c
mosara	MAN/a
mohöre	MAI/a
modele	MAI/c11;II/Bina
ava ² mohe	KWA/b
kaua mose	KWA/a
motera	II/bxv1
motea	II/c1
mote	II/c111
mose	II/b1,b11,b111
moseyo	II/bx
mokela	II/civ,cv,cv11,cix

¹A very consistent set of forms found in neighbouring NAN and AN languages of south-east Papua although there is no suggestion of the direction of spread. Possibly bimorphemic; Cf. mo- banana: set 9, taro: set 4 and kela/sela: sweet potato: set 2, taro: set 21, yam: set 13.

²ava-, kaua-. Cf. sweet potato: set 6 below.

2. gero ¹	BIN/a
kirutua	KOI/f1
irui	KAI
kɛloto } kilotə }	KOI/f111
akira } agira }	EKU/a

¹Cf. related forms in garden: set 2; taro: set 21 and yam: set 13. Here variants are scattered over a wide area from the highlands of western Papua to coastal central Papua in no particular pattern.

3. kali ¹	TEB/a	kaele }	DAG/d,e1,e11,f
gali	TEB/b	kaire }	
ga	IPI	kaire kuta	MAIS(C)
ale	HIG/c (N.Mendi)	kairu kuta	BIN/m
sali	PAW	kaire tuta	BIN/m
kaire	DOG;VII/b	kiru kuta	BIN/n
kaire kut ²	VIII/e	baire	DAG/ai(Gwedede),b,c
kairekut }		baere	DAG/c
kaire kuta	VIII/f1,11,111	bairen	DAG/c,g

¹Reflexes of *kale taro (MN-Chowning), with relatives in taro: set 25 and yam: set 6. Distributionally and formally they divide into two groups, viz. a kali subset in western Papua and a kaire subset in south-eastern Papua.

²kuta. Cf. yam: set 10.

Sweet Potato

4.	kanua ¹	YAR/a(Sth);DAG/a11,a1;MAI/e
	kanu	DAG/a1
	kanua	MAI/b,c1,d,e111,eix
	kənua	MAI/e11
	konwai	GOI/c
	kanu-a	MAI/c
	karude	DAG/h
	kanua	II/Labu,Yoba,Magori;III/a11,av111
	kanuma	VII/b

¹A very consistent set of forms found in neighbouring NAN and AN languages of central and south-east Papua. Probably NAN in origin.

5.	nəkoka ¹ }	KOI/f11
	takoko }	
	takokwa	KOI/f1
	sokose	TUR/Omat1
	tokose	TUR/Dugeme
	kokose	TUR/Karima
	nakorori	POR

¹Widely separated forms occurring in western (TUR;POR) and central Papua.

6.	(h)aukava ¹	KOI/a
	aukapa }	ELE/a
	aukapo }	
	aukeva	ELE/Unspecified
	kauari }	ELE/c
	aukara }	
	ukava	I/a
	kaua mose	KWA/a
	ava mohe	KWA/b
	hawani	TAT

¹There is sufficient variation in these forms to suggest that they are derived from a common element kau (Cf. yam: set 2) and descriptive elements kava (undoubtedly related to Motu (=II/a) kava *mad*, *crazed*, *silly* which is also found in the name of at least one other foodstuff in Motu, viz. taitu kava (from taitu *sweet yam*)), mose, mohe (Cf. set 1 above), and ani (probably a reflex of *kani *to eat*, *food* (OC(EB)-Grace)) cf. taro: set 7, yam: set 19, and banana: set 31. One of the few sets containing cognates from languages around the Gulf of Papua.

7.	<u>hina</u> ¹	HIG/d
	hiña	DUN
	se: no	KOI/cii (Boridi), ciii
	ina	KOI/bi, bii
	inaso	KWA/b
	<u>iniveyu</u> ²	KOI/a (East)
	<u>inueli</u>	KOI/a (East)
	<u>iniveu</u> }	I/e
	<u>inieuda</u> }	

¹Distributionally these forms fall into two subsets: a small one in the Mountains of the Southern Highlands (HIG/d, DUN) and a larger one in neighbouring languages around Port Moresby. The latter subset apparently consists of two elements: (s)ina + veu, veyu, ueli, so of which the first three of the latter are probably related to Koiari (=KOI/b) veu *quickly*. Similar forms to (s)ina also appear as yam (q.v. set 11) in neighbouring NAN languages of south-east Papua.

²veura = *quickly* in Koiari (KOI/b). But cf. sweet potato: set 11, yam: set 41 and yam: Isolates.

8.	ʌŋge ¹	BIN/h
	ana	BIN/d
	tana	DAG/ai
	tanaba	DAG/c

¹Cf. the following related forms from the central highlands of New Guinea: an̄ge *sweet potato* in Hewa, and an̄gá *sweet potato* in Wahgi.

9.	kumwala ¹	III/c; V/o;
	komwara	V/b
	kumuara	V/d, k;
	kumala	VI/bvi
	kumara	KOI/bii
	kamara	KIW/eiii
	amareta	ETF/b
	ambara }	GOI/c
	biro }	
	thambara	BIN/g
	tambara	BIN/e, i
	kevara	MAN/a
	evara	KOI/dii

¹Related to kumara (and similar forms) *sweet potato* found throughout Polynesia. For example, Ray (1907:168) gives: "kumala, *sweet potato* (*Ipomoea Chrysorrhiza*).... Tongan gumala, Marquesas Is. kumaa, Banks Is., Fiji, and New Zealand kumara". Cf. also garden: set 27 and yam: set 25.

Sweet Potato

10.	siyofulu ¹	ESF/a
	siyafuu	ESF/b
	siyobulu	ESF/e
	siyabul	ESF/d
	siapuru }	BOS/a,b,c; WKU/a
	siabulu }	
	siyabulu	BOS/a
	siapuri	BAI
	supuru	WKU/a
	tia	HIG/a
	dia	TEB/c
	diani	TUR/Barika

¹A very interesting set with relatives in many languages of West Irian. Cf. the following kindly supplied by Dr C.L. Voorhoeve: sesiyuro (Iria (NAN)- west side of Kamarau Bay), sersiabura (Asienará (NAN)- west side of Kamarau Bay), sie, slbu (Iha (NAN)-eastern side of MacCluer Gulf), sijapido (Inanwatan (NAN)-western side of MacCluer Gulf), siäp (Borái (AN)- north-western side of Geelvink Bay) and others. Cf. also garden: set 1 (buru); fence: sets 4 and 16 (buru); yam: set 4 (buru); taro: set 38 (buru); garden: set 1 (isia); taro: set 13 (isia).

11.	kupe ¹	GOI/d
	kupe	GOI/e(Karukaru)
	kupe	GOI/d
	kupa	GOI/d,e
	<u>gobe</u> ?u ²	KOI/ci
	<u>kobe</u> ?u	KOI/ci
	<u>gobou</u>	KOI/ci(Eava)
	<u>gobeu</u>	KOI/ci1
	<u>kubea</u>	KOI/ci11
	<u>gobeu</u>	KOI/b,civ,cv,cvi
	<u>kobe</u> ?a	KOI/b
	<u>gobe</u> ?u	KOI/di1
	<u>hope</u> ?a }	ANG/ 1
	<u>hobe</u> a }	

¹Reflexes of *huvi yam (MN-Chowning) and other similar reconstructed forms given in yam: set 7. See also relatives in garden: set 20, taro: Isolates, banana: set 7.

²e?u, ε?u, e?a. Cf. yam: set 41, Isolates and sweet potato: set 7.

12.	wabayur ¹	MOR/g
	wopowi	MOR/i
	wasa	ANG/a
	wapaaya	ANG/b
	zapaaya	ANG/c
	mpaaya	ANG/d
	waahape	ANG/e
	mpwaya	ANG/f
	wopa	ANG/g
	napai?	ANG/h

¹One of the few sets containing cognates in Angan (ANG) languages. Cf. yam: set 20.

13.	nori ¹	KIW/ai,aii,b,c,dii,diii,g;TUR (Pepeha)
	n̄ri	TIR/a
	ori	TUR(Karami)
	nuri	ETF/d
	nai	TIR/d;MOR/a,b,c,d,e
	nae	PAH/a

¹A small set of forms found only in western Papua in most member languages of the Trans-Fly Stock and neighbouring languages of the Turama Family.

14.	faiya ¹	WKU/c;TUR/Ikobi
-----	--------------------	-----------------

¹Cf. waia, waisa, yam: set 16.

15.	khonε ¹	BIN/n
	khone	MAIS
	khoni	KWA/a;KOI/bii
	kuni	MAN/a
	koni } kauni }	I/b
	?ono	I/d
	kone	I/f
	koniparau ²	II/b

¹These forms group into two areal subsets in south-east Papua: one around Cape Nelson on the north coast and one around Port Moresby on the south. No direction of spread is evident however. Cf. honi *taro* (q.v. Isolates).

²Parau. No apparant cognates so far located.

Sweet Potato

- | | | |
|-----|--------------------|-----------------------------|
| 16. | kaima ¹ | GOG |
| | kaimba | BOA/a111 |
| | kaima | UBP/a;WAI;YAR/d |
| | kaema | I/b,c;II/a,b111,bv,bvi,bvii |
| | kaema taʔa | |

¹A very consistent set of forms scattered right across Papua in isolated groups of languages. However, as kaema is the Hiri (or Police) form used for elicitation purposes in survey work it is possible that this scatter results from elicitation errors or represents a pattern of borrowing from Hiri Motu. Needs checking.

- | | | |
|-----|---------------------|-----------|
| 17. | pedede ¹ | V/f |
| | kedede | V/b,i,e,t |
| | pedede | ROS |

¹One of the few sets showing contact between Yele (the NAN language of Rossel Island) and AN languages of Papua.

- | | | |
|-----|--|--|
| 18. | kambek }
kampekyang }
kaump }
kampekyang } | GOI/a
GOI/b
GOI/d |
| 19. | suai
subume
seprum | APA/a
APA/b
APA/c |
| 20. | karo:pi
kəroyɛnɔ
waropi
torooppu
urugana
urugabau | KIW/e11
TIR/b
KIW/e11
KIW/a11
ETF/c
MAB |
| 21. | ubuzubudsa
ipounaro
iwioapu | ETF/a
KIW/b
KIW/a111 |
| 22. | *waan
*wan | OK(PMO)
OK(PLO) |

23.	biaka beḍaka baiaka beiyaka	V/a V/m V/n V/s
24.	sapi ṣa:pi	HIG/b HIG/c
25.	mondo modo	HIG/b(East) WIR

Isolates

adarA ¹	
atari }	GOI/c
a dari	
adang	
*bo(n)te	OK(PLO)
diani	TUR/Barika
mamusi	KOI/fi
meine	MOR/f
nel	ETF/b
phuth eitel	ROS
susuano	UBP/b
yuku	BOG
yoꝛuto	ROS
konwai	GOI/c
mao ²	PUR
mekoi	I/a
gogolin	IX/a
lome	V/p
ladagu	VIII/b
?o?opu	I/f
simsimwai	IX/c
peyapeya	VIII/c
gegeulina	X/a
yariro	X/c
?sayes	XII/a
watsap	XII/b
gogie/koki ³	KOI/e
ku:tazi ⁴	MAIS(K)

¹Also given as *taro*, q.v. set 16.

²Reflex of *mao *taro*. (MN-Chowning) and *ḡmao *taro* (OMA-Grace). See notes to yam: set 3.

³Also occurs as *taro*, q.v. set 27.

⁴Cf. sweet potato: set 3 above.

10.14. Taro

1.	me ¹	WKU/a
	mber	MOR/i
	bed	MOR/h
	tebele	MAI/e
	pere	TUR/c
	firi	TUR/Dugeme
	meli	POR
	mi	TUR/Bariba
	mea	TUR/Karima

¹Cf. similar forms in yam: set 1, fence: set 5, garden: set 13 and also the following kindly supplied by Dr K.J. Franklin from NAN languages of the central highlands of New Guinea: mi (Wahgi), mé (Nii), mə (Kobon), me (Chuave), mé (Golin), mé (Salt Ini). A similar form mE also occurs in the Madang area (Z'Graggen (1969:57,67)).

2.	mai ¹	HIG/a
	maa	HIG/b
	ma	HIG/d
	mafi	MAN/a
	ma	BIN/c,d
	ba	BIN/d,e,f,g,h,i,j
	wadu/vadu	KOI/a,bi,bii
	madu	KOI/di,dii
	elomađu	KOI/di
	maku	KOI/e
	ha?u	MAI/a
	ma	BIN/a
	baxa	BIN/i

¹Cf. related forms in garden: set 1, f.n.2; fence: set 5, f.n.2, and following kindly supplied by Dr K.J. Franklin from NAN languages of the central highlands of New Guinea: maa (Enga), maiyáamba (Auyana - for (y)áamba cf. set 4 below), mainai (Lembena), mafó (Siane), masí (Gahuku), masa (Asaro), ama (Benabena). The following related forms also occur in NAN languages of the Madang area (Z'Graggen (1969:57,129)): ma, mamu, mam, mom, moma.

3.	mi ¹	WIR
	mina	KOI/di
	mina	YAR/aia(Sth),c
	miki	KAI

¹A scattered group occurring in NAN languages of western and south-eastern Papua.

4.	yom ¹	MOR/c
	q	TEB/a,c
	om/omo	PAW
	ombo	KOI/f1
	omo/?omo	MAI/c1,c11
	mu:m	TIR/a

¹One of the few sets containing cognates from Pawaian (PAW) inland of the Gulf of Papua. Cf. also (y)áámba in maiyáámba taro (Auyana) referred to in footnote 1 of set 2 above.

5.	lologube ¹	ETF/a
	orpuo	TUR(Karami)
	vɔř	ETF/b
	holwa	ESF/a
	ho	ESF/b
	hou	ESF/d
	hou	BOS/a
	ulotabasi	BOS/b
	huwa	APA/b
	hogama	WAI

¹A widely scattered group in western Papua.

6.	ipan/ipam ¹	HIG/c
	ban	MAI/b,c1,c11,d
	panine/bani	MAN/b
	bani	MAN/b;YAR/a;MAI/c
	kibani	DAG/a11;II/d;III/a11

¹Formally this set falls into two subsets - those which have retained ki- and those which have lost it. The distribution of these forms is interesting in that the ki-subset occurs in the highlands of the north-west corner of Papua (HIG/c) and again in neighbouring AN and NAN languages of south-east Papua alongside languages which have lost ki-. A similar distribution is to be seen in set 14 below. Relatives appear as words for *yam* in languages of the same area - see *yam*: set 8. Cf. also *pane*¹ *taro* in Hewa from the central Highlands of New Guinea.

7.	kani/?ani ¹	VII/c
	<u>sagani</u>	KIW/dii,diii
	<u>tagani</u> ²	KIW/f
	<u>ganisa</u>	ANG/g
	<u>?ani</u>	DAG/d
	?^n	DAG/ei
	an	DAG/eii
	<u>aneg</u>	ETF/d
	<u>anega</u>	KIW/aiii

¹ Reflexes of *kani *to eat, food* (OC(EB)-Grace). Related forms are to be found in yam: set 19 and banana: set 31. One of the few sets containing cognates from Angan (ANG) languages.

² sa-, ta-. See footnote 4 to garden: set 1.

8.	ta ¹	DUN
	<u>saso</u>	KIW/a,a11,b
	nago	KIW/a,c;TUR(Pepehe)
	hago	KIW/c
	dafu	TUR/d

¹ Cf. related forms in yam: set 12 and banana: set 8.

9.	bibi	GOG
	bipi	BAI
	dibi	IPI
10.	ture ¹	KIW/eii,eiii
	ture:	KIW/g
	duŋə	MOR/e
	tsuphu	MOR/f
	ule	DAG/g
	huli	V/1
	uli	IX/c
	?uli	V/1

¹ Another set showing a connection between western and south-east Papua. Loss of t suggests a west-east movement.

11.	noha ¹	KOI/f1
	noa	TAT
	noho/noha	KOI/f11
	nouhə/nohu	KOI/f111
	ʔono	MAN/a

¹One of the few sets containing cognates from Tate (TAT) in the Gulf of Papua.

12.	mudε ¹	KWA/a,b
	mudie	MAN/a
	munde	GOI/e
	muʔa	KOI/c1
	buwaʔa	KWA/c
	munde	GOI/e
	mude	II/b111,bv

¹Possibly related to mote and similar forms for *sweet potato* given in sweet potato: set 1.

13.	isia ¹	BIN/k,1,m,n
	yisiya	BIN/n
	gesi	DOG
	sisi	II/Labu
	diyas	ESF/c
	iya	KOI/c11

¹Cf. relatives in garden: set 1, and sweet potato: set 10.

14.	tika ¹	ANG/a
	eka	EKU/a

¹One of the few sets containing cognates in Angan (ANG) languages.

15.	udi ¹	PAW;UBP/a
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¹One of the few sets containing cognates in Pawaiian (PAW).

Taro

16. atari¹ GOI/c
dariq TEB/b

¹Cf. relatives in garden: Isolates and sweet potato: Isolates.

17. fadia¹ KOI/c11
fadia KOI/c1v
vadia KOI/cv
adi DAG/d
wasi[?] VIII/e
vai VIII/f1
wax VIII/f11, f111

¹Locally distributed in AN and NAN languages of south-east Papua. No obvious direction of spread.

18. nai DAG/f
nwai YAR/d

19. giafani BOS/b
iyafane EKU/a

20. taibu BOS/a
tab DAG/b

21. kera¹ KIW/a11
elomaðu KOI/d1
kero VIII/b
keru VIII/c

¹Cf. relatives in garden: set 2, sweet potato: set 2, and yam: set 13.

22. kaata ANG/b
koʔo ANG/e
gaawa ANG/f
kaat ANG/h
naaweri ANG/k
gaawa ANG/l
gwaama ANG/c
kwaava ANG/d
kwam APA/a
hwam APA/c

23. taro¹ HIG/a;PM;I/b;II/a,biii
 als ETF/c

¹Reflexes of *tales (PAN-Dyen;Capell), *talo (MN-Chowning), *ntalo(s) (OC(EB))-Grace), and *talət (PAN-Dempwolff). In Papua cognates occur in NAN languages of western Papua (viz. HIG, ETF) and in three AN languages of central Papua, including the lingua franca Hiri (or Police) Motu. This distribution should be treated carefully therefore since some or all of the forms may be elicitation errors or represent borrowings from this lingua franca. Capell (1943:147-267) notes that related forms occur in Indonesian languages "though not all for the taro plant".

24. ekwat DAG/g
 gikwa V/w
 bikwa V/g

25. kare¹ MAN/a
 kale II/bi,bii,bvi,bvii,bviii,bxvi;II/ci,ciii
 kae BIN/g;II/bx
 ?ale II/civ

¹Reflexes of *kale taro (MN-Chowning). Cognates distributed throughout AN and NAN languages in central Papua. Related forms also occur as sweet potato: set 3 and yam: set 6.

26. ubeya TIR/b
 beiya TIR/d
 piyaŋ MOR/d
 wiba (?) MAB

27. kəkia¹ BOA/a11,b1,bii
 kokia } BOA/a111
 kəkea }

¹Cf. sweet potato: Isolates.

28. poera ELE/a
 ho?ero } ELE/c
 soera }
 omera PUR

Taro

29. otot PAH/a
tʌthkʌp MOR/a
30. towiaa? ANG/1
towia? ANG/j
tauwie? ANG/j
31. *yamen OK PLO)
*yemën OK(PMO)
32. nagut DAG/a1,a11
natu DAG/c
naguda DAG/c
namu DAG/c
33. kabu MAN/b
gavu MAN/b(Uderi)
34. ukava¹ I/a
a?ava I/f
?a?ara I/f

¹Cf. related forms in sweet potato: set 6 and yam: set 2.

35. o?ou I/a
hobo?o I/b
36. daidai V/a
deidei V/m
37. we.da III/c
weda V/b,o,p,u,r
pwea V/f
38. oi¹ II/Bina
boro V/b

¹Cf. related forms in garden: set 1, fence: sets 4 and 16, sweet potato: set 10, and yam: set 4.

39. kopare¹ } BOS/c
kobaeri } WKU/a
saparo } WKU/c
saparu }

¹ko-, sa-. See garden: set 1, f.n.4.

40. keu(keu) II/cv,cvi,cvii,cix
kweu V/s

Isolates

tenta	MOR/g	rileda	I/e
purari	UBP/a	mavu	VII/b
kimol	GOI/b	sinasin	IX/d
hemara	GOI/c	koiabo	II/Yoba
hu:si	KOI/ci11	waupio	V/k
kokoda	KOI/cvi	duðu	V/d
masuku	BOG	bubu	XI/a
maradi	KOI/di(Emo)	wusi	X/c
mage	KOI/e	bau	I/d
kumona	MAIS	ngeba/ngapamek	GOI/a
kukuni	MAIS(Kos)	xεγε/xεxe	KOI/ci
kukuŋ	MAIS(Cos) VIII/e	tamin	DAG/g
kəqə	ROS	nat(a)	DAG/h
dədə	MAI/e11,ex1	yawa	X/a
burena	I/e	kuve	} ¹ GOI/d
(k)udo	III/a11,av11	kuvalava	
?ouf	XII/b	kubu	
maura	V/t	goin	MAB
ilu	I/c	honi ²	VI/bv1

¹Reflex of *huvi *yam* (MN-Chowning) and similar reconstructed forms given in *yam*: set 10, q.v.

²Cf. sweet potato: set 15.

10.15. Yam

1. ere ¹	DUN;HIG/d
erawo	KIW/a11
yirau	TIR/a
ɛrau [^]	TIR/b
keri ^ˆ si	WKU/c
feri	TUR/a
efare	ELE/c
mbira	HIG/b
mbere	HIG/c
beli	PAW
[ilawa]	MAI/a
pe ^ˆ dai	GOI/d
obiri	MAI/e11,e111,ex11
obi ^ˆ li	DAG/a11
wabi ^ˆ l	MAI/c1,c11
wabi ^ˆ n	MAI/a,b
bai ^ˆ ?e	DAG/g
[papi]	MOR/d
[ope ^ˆ ti]	GOI/d
[wabi ^ˆ -i]	MAI/c
wabi ^ˆ ri	II/Labu
obi ^ˆ ri	III/a11
vabu ^ˆ li	II/b1,b11,b111,bv1,bv11,bxv1
[wabu ^ˆ ri]	II/bv,bv111,bx

¹Cf. relatives in garden: set 13, fence: set 15, and taro: set 1.

2. kau ¹	YAR/a11(Sth),c
ka ^ˆ ?u	MAN/b;MAI/d;YAR/a,b,c
xa ^ˆ ?u	YAR/a
kau-u	MAI/c
u-a	MAI/c
uware	BIN/i
uare	BIN/c
uwawia	Bin/d
[a ^ˆ ula]	YAR/a11(Sth)
[au ^ˆ -ula]	MAI/c
au	ANG/h
lauwikmek	GOI/a
lawikyeikmek	GOI/a
[lawikwizimek]	GOI/a
[aumai]	GOI/c
[tau ^ˆ ?era]	MAN/b
[?aura]	YAR/a
[awura]	YAR/b
iau	DAG/g

¹Cf. relatives in sweet potato: set 6, and comments on ko- in garden: set 1, f.n.4.

3.	mao ¹	BOA/a111;II/bv
	maho	KIW/d111,e11,e111;UBP/a;IPI;KWA/a;PM;II/a
	ma'ou	KIW/g
	mau	BIN/e
	[maho]	KWA/a,MAI/b
	[maho'uro]	KWA/b
	ma.o	II/b

¹Reflexes of *mao taro (MN-Chowning) and *ŋmao taro (OMA-Grace). Cognates distributed throughout AN and NAN languages of south-east Papua and NAN languages of western Papua.

4.	buřkhu ¹	ETF/c
	borometa	ETF/d
	bolu	TEB/a
	[boluʔʌ]	KOI/c
	[bɔlukʌ]	KOI/c11
	[boluka]	KOI/c111,civ
	bapore	ELE/a
	mapore	ELE/a,c
	maperi	TAT
	[amboro]	BIN/h
	[kamboro]	BIN/1,k
	[hopoi]	GOI/c
	[boʔai]	DAG/a11,e1
	[bolaʔi]	DAG/e1

¹Cf. relatives in garden: set 1, fence: sets 4 and 16, sweet potato: set 10, and taro: set 38.

5.	aneni ¹	POR
	[anivi]	KIW/f
	ane	KAI
	aine	GOI/e
	ana	BIN/e
	angi	BIN/f

¹These forms occur in two widely separated areas - one in western and one in central and south-east Papua.

6.	<i>galiyo</i> ¹	ESF/a
	<i>gayo</i>	ESF/b
	<i>gali</i>	ESF/c,d
	<i>kara</i>	BOS/a
	<i>kaaliya</i>	BOS/a
	[<i>yare</i>]	KOI/d11
	<i>kae</i>	BIN/g
	<i>gae</i>	BIN/i

¹Reflexes of **kale taro* (MN-Chowning). Cf. relatives in sweet potato: set 3 and taro: set 25.

7.	<i>ʔuvi</i> ¹	VII/c
	<i>kubi</i>	VIII/c
	<i>kuv</i>	IX/d
	<i>ubi</i>	DOG

¹Reflexes of **huvi* (MN-Chowning), **qupi* (OC-Grace), **qubi*[ʔh] (PAN-Dyen), **ʔubi* (PAN-Dempwolff) *yam*. Relatives also in sweet potato: set 11, taro: Isolates, garden: set 20, and banana: set 7.

8.	<i>bani</i> ¹	MAN/b
	[<i>bani</i>]	MAN/b; DAG/b
	[<i>banai/banae</i>]	DAG/a1,g

¹Cf. relatives in taro: set 6.

9.	<i>sukunu</i> ¹	TUR/b
	<i>sykan(u)</i>	TUR/c
	<i>sugsun</i>	MAIS(C)
	<i>susuni</i>	MAIS(K)
	<i>soʔo roi</i>	PAW

¹A doubtful set but one of the few containing representatives from Pawaian (PAW).

10.	<u>kuta</u> ¹	DAG/h;BIN/n;MAIS(C)
	koroma <u>kuta</u>	BIN/n
	?ua	MAI/ci,cii,eii,eiii
	oru <u>uta</u> (<i>garden</i>)	ELE/c
	ut/ <u>uta</u> ?	VIII/e,fii
	uta	VIII/fi
	ua	III/aii

¹Cf. relatives in sweet potato: set 3.

11.	<u>sina</u> ¹	KOI/a
	<u>asĩ</u>	GOI/e(karukaru)
	sanaru	KOI/di
	[sanaru]	KOI/dii
	[sin kau] ²	YAR/c
	[sini]	YAR/c
	kini	ROS

¹Cf. relatives in sweet potato: set 7.

²kau. Cf. sweet potato: set 6 and yam: set 2.

12.	<u>sagu</u> ¹	MAB
	hago	KOI/bi
	sago	KOI/bi,bii
	wagoro	DAG/f

¹Cf. relatives in taro: set 8 and banana: set 8.

13.	<u>keru</u> ¹	VIII/b
	<u>elo</u> sivei	KOI/di
	<u>iro</u>	KOI/di,dii
	kiroma	MAN/a
	<u>ilo</u>	YAR/d
	[iro]	KOI/d
	[iroma]	MAN/b(Uderi)

¹Cf. relatives in garden: set 2, sweet potato: set 2, and taro: set 21.

14.	kaitu ¹	PUR
	[haihu]	MAN/a
	saisu	MAN/a
	[hæhu]	MAN/b
	[taitu]	PM
	haihu	I/b
	taʔa	I/b
	taʔa haihu	I/b
	kaio	I/d
	kaiku	I/f
	[kaiku]	I/f
	[taitu]	II/a
	kaiu	II/ci
	taiuʔŋ	X/d

¹Cognates in the NAN languages suspicious loans or elicitation errors from Hiri (or olice) Motu, the principal lingua franca and survey language of Papua.

15.	suai ¹	APA/a
	swai	APA/b
	suʔa	ETF/b

¹A particularly doubtful set.

16.	waisa ¹	GOG;BAI
	[waia]	KOI/a,b1,b11
	[waiagu]	KOI/ci(Eava)
	[waiaka]	KOI/f11

¹Cognates distributed in western (BAI) and central Papua.

17.	umamo ¹	KIW/a1,c
	umamu	KIW/c,d11
	hamano	EKU/a

¹Another particularly doubtful set.

18. [komba]¹ DAG/h;BIN/n
 kombi MAIS(K)
 ko:mba/komba BIN/l,m
 koroma kuta² BIN/n
 [gumoi] KOI/cvi
 [gɔmotɛ] KOI/fi
 [komba sini]³ }
 [sini komba] } BIN/l

¹A small but interesting set related to the following given by Watson (1968) for *Pueraria lobata* in parts of the central Highlands of New Guinea: kagomba (Watabung, west of Goroka), goruma, ngonduma (Chimbu).

²kuta. Cf. yam: set 10.

³sini. Cf. yam: set 11.

19. aniani¹ V/f
 yani II/cv,v1,ix
 gani III/cvii
 kanikani V/q
 anemai I/a
 narem III/aii
 saganī KIW/dii

¹Reflexes of *kani *food, to eat* (OC(EB)-Grace). Cf. relatives in taro: set 7 and banana: set 31.

20. wabahu¹ KOI/bi
 ʌbau KOI/bi
 yabahu KOI/bii
 habahu KOI/bii
 xaba KOI/cii,civ
 haba KOI/ciii
 aba KOI/cv,cvi

¹Cf. relatives in sweet potato: set 12.

21. ahadza KOI/fii
 ahadzɛ KOI/fi
 hoedzɛ KOI/fiii
 hoaidzɛ KOI/fiii
 [howʌ] GOI/e(Karukaru)
 [badza] KOI/di
 [vadziaku] KOI/e
 [vadziəge] KOI/e
 [wadziʌŋga] KOI/fiii
 [wadzʌŋga] KOI/fiii

Yam

22. *wan¹ OK(PLO)
 *waan OK(PMO)

¹Cf. the following kindly supplied by Dr K.J. Franklin from NAN languages of the central highlands of New Guinea: hòn Golin, hòn Salt-Ini, fonth Kobon, wan Maring, nandi Binumaria.

23. gasa¹ BIN/a
 gaso(u) BIN/i,n

¹Cf. the following kindly supplied by Dr K.J. Franklin from NAN languages of the central highlands of New Guinea: gasa Asaro, gasi Gahuku, ká Siane.

24. dzuka BIN/k
 dzoyukuta BIN/n

25. gumala¹ KWA/c
 kuvara MAN/b
 [umana] KWA/a
 gubara MAN/b

¹Cf. relatives in sweet potato: set 9.

26. hohomi KWA/a
 [hohomi] KWA/a

27. timbe MOR/e
 dambaj MOR/f

28. wε.m MOR/a
 wεm MOR/b

29. malapta ANG/a
 malata ANG/b

30. lwie ETF/a
 lewer ETF/d

- | | | |
|-----|--|---|
| 31. | aavava
haagwa
aakwasa
tangwa?
taangwe?
taungwe?
save
hankuinka
hanguinka | ANG/d
ANG/f
ANG/g
ANG/i
ANG/j
ANG/j
ANG/k
ANG/l
ANG/l |
| 32. | opuo
ohunaro
unaro | KIW/a111
KIW/b
KIW/b |
| 33. | kwateya
kwatea
e?a
kwakiki
wate.ya | III/c
V/b,u
V/d
V/n
V/o |
| 34. | kabub
[kabub]
[kabu] | VIII/f11
VIII/e
VIII/f1 |
| 35. | kokoio
kokoya | I/f
VII/b |
| 36. | abuaga
?abwaga | V/1
V/1 |
| 37. | dahe
ra | X/c
X/d |
| 38. | dawa
[dawa] | II/bv11,v
II/avi,v11 |
| 39. | malowapa
malawapa | II/ci,111
II/civ |
| 40. | a
a?a | V/m
V/s |

41. [iʔu]¹ MAI/d;YAR/a(Sth)
[eʔu] YAR/d

¹Cf. sweet potato: sets 7 and 11, and yam: Isolates.

42. neka(?) DAG/c
neke DAG/d
niʔa DAG/e1,e11,f

Isolates

abage	APA/b
doiti,loite,doite	GOI/d
gami	ANG/c
ya:mo	HIG/a
pam	DAG/a1,a11,bx,c(Kanamara)
[dabu]	KOI/a
[du]	KIW/a
[posi]	DAG/d
[gigide]	BIN/l
[kakanda]	BIN/m
[abu]	DOG
dedze	KOI/e(Asapa)
kie	KOI/e(Namanadza)
naba	KWA/b
gegae	PAH/a
gabau	MAB
ketapu	EKU/a
mingane	MOR/c
hazi	MOR/d
hiagato	WKU/a
lovi ¹	KOI/c11
aleve	KOI/civ
ario	KOI/di
[arie]	KOI/di
ʎngebe	BIN/h
arago	KOI/ci
lama	I/a
kapara ²	II/Yoba
apci	III/avii
bebai	V/b,k,p,r
kaula	IX/c
veʔu ³	I/c
idiu	II/Bina
lova ⁴	II/d
wamu	V/a
koida	VI/bvi
modara	VII/c
anan	X/a

Isolates

tuwu	XI/a
xemb	XII/a
kinare	V/t
[imoda]	I/e
[nona]	VII/b
[wireka]	VII/c
[posika]	VII/c
[bibibi]	VIII/f111
[nen]	XII/a
bureda }	I/e
burena }	
[posika]	VII/c
zong }	GOI/c
zorA	
manigo	TEB/b

¹lovi. Cf. garden: set 11.

²Could perhaps be included in yam: set 25.

³Cf. sweet potato: set 7, f.n.2.

⁴Cf. fence: set 9.

Banana

10.16. Banana

1.	napet ¹	BOA/a11
	napeti	BOA/a111
	nepet	BOA/a111
	napete	BOA/b1,b11
	napet	MOR/1
	napero	UBP/a;PAW
	napeto	IPI
	napewa	TUR(Pepeha)

¹Widely distributed in western Papua but with representatives in languages inland of the Gulf of Papua (viz. IPI and PAW). One of the few sets with cognates in Pawaian (PAW).

2.	sela ¹	ETF/b
	teya	MOR/g
	tae	MOR/h
	se	ANG/e
	hyely+	ANG/g
	teri }	GOI/c
	?eri }	
	perai }	GOI/d
	pelei }	

¹One of the few sets with cognates in Angan (ANG) languages.

3.	madaea ¹	KIW/a11
	masei	BAI
	malae	EKU/a
	imara	TUR/(Karami)
	make?i	KOI/f111

¹This set widely distributed in western Papua with one cognate also in central Papua.

4.	kure ¹	ANG/b
	ori	POR
	ure	KIW/a11,a111
	hura	BIN/d
	kunu	TUR/d,Dugeme
	kqnu	TUR/c,Karima

¹One of the few sets with cognates in Angan (ANG) languages. Remainder of cognates distributed in central and western Papua.

5.	toro ¹	BOS/c
	oru	ELE/c
	ɔru	YAR/d
	tɔ	TEB/a

¹One of the few sets with cognates in Elemen (ELE) languages of the Gulf of Papua.

6.	kai ¹	BOS/a;HIG/b,d
	kaii	BOS/a
	ai	TEB/b,c
	nkati	ANG/h
	aiwaai	ANG/k
	kae vaea	PUR
	hai	HIG/d
	aisi	TAT

¹An unusual set with many representatives in languages of the Gulf District (viz. TAT, PUR, ANG, TEB).

7.	ufi ¹	KOI/ao,a11
	uhi	KOI/a1,a11
	wi	KOI/a1
	wɔhi	KOI/a1
	uvu	KOI/ci
	uvɛ	KOI/c11,c111,c1v,cv,cv1
	kufɛ	GOI/d
	udzɛ	KOI/e

¹Reflexes of *huvi (MN-Chowning) and other similar reconstructions for *yam* given in *yam*: set 7. Relatives also in garden: set 20, sweet potato: set 11, and taro: Isolates.

8.	hazo ¹	KWA/a,b
	hahoʔa	MAN/b
	ahaʔa	MAN/b
	agovoto	MAN/b(Uder1)
	hakoʌ	III/av111
	hakoʌ	VI/bv1

¹Cf. relatives in taro: set 8, and yam: set 12.

Banana

9.	um ¹	MAI/ci
	?um	MAI/cii
	mumu	KOI/d
	mumai	KOI/di
	mumuro	KOI/di
	mumo	KOI/dii
	mo'o	MAI/d,c;YAR/a,b
	mo	YAR/c
	mo'u	YAR/aia(Sth)

¹A locally distributed set in south-east Papua suspiciously like mugu, muk *banana* given by Z'Graggen (1969:67) for NAN languages of the Usur Group of the Madang area.

10.	bija ¹	BIN/c
	biza	BIN/a
	pize,pije,bije	BIN/g,h
	bidzo	BIN/i,k,n
	bijo	BIN/j
	bidze	BIN/l
	besa	DOG
	mɛ:zi	MAIS(K)
	me.	MAIS(C)
	bido	BIN/d
	bioho	MAI/exii
	bito,bido	BIN/e
	biro	BIN/l,m
	bizhe	BIN/f

¹A consistent set found mostly in neighbouring languages along the north-east coast but with one example from the south coast of south-east Papua (viz. MAI).

11.	owe ¹	APA/b
	awe	APA/c
	kɔwɔ	MOR/f
	dawa	MAB

¹A doubtful set from western Papua.

12.	nændzi ¹	MOR/a
	naggi	MOR/b
	nai	TUR/Bariba
	naie	TUR/a

¹A doubtful and very restricted set in western Papua.

13.	kiae ¹	II/Yoba
	kisai }	III/a11
	kitai	
	ete/pɛtɛi	DAG/d
	kɛɛ/ki	ROS/a

¹Cognates found in NAN and AN languages of south-east Papua but one of the few sets containing cognates from Yele, the NAN language of Rossel Island.

14.	ebe ¹	ESF/a
	ee	ESF/b
	ebo	ESF/c
	eb	ESF/d
	pou	HIG/a
	epolo	HIG/c

¹A restricted set found only in languages of the north-west of Papua.

15.	dima ¹	APA/a
	sime	KIW/a
	simɛ?	TIR/a
	seima	TIR/d
	teipU	GOI/c

¹A widely distributed set with representatives in central and western Papua.

16.	dupali	KIW/d11
	dubai	KIW/d111,e11,e111
	dubuai	KIW/f
	duba:ɪ	KIW/g
	dobali	ETF/a
	up	PAH/a
	dubali	UBP/b
	opae	KIW/a11

17.	katama	MAB
	katam	ETF/c
	zaruam	ETF/d
	marhak-katam	ETF/d

18.	bia'e	ELE/a
	meae	ELE/a,c
	mia'e	ELE/c

Banana

- | | | |
|-----|---|---|
| 19. | adzue
adzudza
adzödza^
adzədza^
adzuədze
^dzədze | KOI/di
KOI/f
KOI/fii
KOI/fii
KOI/fi
KOI/fiii |
| 20. | ada'am
navaha
lavaha
lavata
lavasa | MAI/a
MAI/b
MAI/c1,c11
MAI/eii
MAI/e(except viii) |
| 21. | yis
viđ
viđa | MOR/c
MOR/d
MOR/e |
| 22. | *yum
*suum | OK(PLO)
OK(PMO) |
| 23. | kobira
kobia
ubira | KIW/a,c
KIW/b
WAI |
| 24. | magu
magou | BOS/b
BOG |
| 25. | yo'o
dzo'o | PAW
PAW |
| 26. | kaputa
ga | WKU/a,c
EKU/a |
| 27. | leiyang
i | GOI/a
GOI/b |

- | | | |
|---|--|---|
| 28. | ogi
ʔo(:)
o
moe
moʔa
mwoʔa
moke
moki
mo/ɔke
ɔgi/ogi
oε | DAG/a,g,h
DAG/ei
DAG/eii,f
V/f
V/l
V/t
V/n,q
VII/c
VIII/c
VIII/e(K)
VIII/fi |
| 29. | youp }
eoup
yauɸ | DAG/a11
DAG/b |
| 30. | tauga
kauwa
kauga | MAN/a
BIN/l(Foru),n
BIN/n |
| 31. | a:ni/ʔani ¹
ɲani
ɣani
ani | I/f
II/b
II/bv,ci11
II/cv |
| <hr/> | | |
| ¹ Reflexes of *kani <i>food, to eat</i> (OC(EB)-Grace). Relatives also in taro: set 7 and yam: set 19. | | |
| <hr/> | | |
| 32. | biku
beu
piku | II/a,PM
II/Magori
II/ci |
| 33. | asai | III/a11,av111 |
| 34. | bwahiki
bwaʔi
bwakei
bwa.sihe
bahiki
buae | V/u;p
V/d
IX/d
X/c
X/d
II/bv11 |
| 35. | ɣaro
aru | VII/c
VIII/b |

Banana

- | | | |
|-----|---|--|
| 36. | ox
tsok | VIII/f11,111
XII/b |
| 37. | yalivata
ɲaiwata
karawa | II/b1,11,111,vi,vii
II/bx
II/cvii,cix |
| 38. | piaʔi
kiaʔi | II/Bina
MAI/eviii |
| 39. | u.di ¹
hudzi
ʔudi
wudi
usi
hudi
udzɛ | III/c
V/u
V/b
V/1
IX/c
V/r
KOI/e |

¹Reflexes of *pudi *banana* (MN-Dhowning), *puti *banana* (OC(EB)-Grace), *pun[tɨ]i[gʔh] *banana* (PAN-Dyen), and *pun[tɨ]i['] *banana* (PAN-Dempwolff). Capell (1943:130/235) notes also that the Motu dui *banana tree* is probably a metathesized version of the udi form, and that "the word can be followed through north Papua though other non-IN words intervene."

- | | | |
|-----|--|--|
| 40. | naarya
zaaya
laaya
naanga
nanga
gaawa
nggaawe?
nggauwe? | ANG/a,b
ANG/c
ANG/d
ANG/f
ANG/l
ANG/i
ANG j
ANG/j |
|-----|--|--|

Isolates

hale	DUN
pidielΛ	TIR/b
kamoki	KAI
buai	KOI/e
vaduna	KWA/c
namo	MAN/a
inuga	MAN/a
magota? }	DAG/c
maguta }	DAG/g
kwasi	GOI/e (Karukaru)
ha.mbe }	
ambe }	
kaba	ETF/d
kaka	WIR
karua	BIN/d
u?u.na/u?una	I/b
ko.	I/d
ramada	I/e
gida	II/Ouma
pia?i	II/Bina
yapwae	V/k
pihia	V/o
yabeka	VII/b
me	VIII/e(U)
suΛ	X/a
ɬalo	V/m
pwai pwai	X/d
kunΛmwΛnΛ	XI/a
njeñ	XII/a
dawau	II/bviii
agaga	II/bxvi
yavua	II/cv,cvi
kami.ha	V/s

Sugarcane

10.17. Sugarcane

1. ure ¹	KIW/a,a11,a111,d11,e11
kure	KIW/b,c
uri	KIW/d111
uʔe	KIW/e111
ue	KIW/e111
uwε	KIW/f
uwε:	KIW/g
ŋulu	ETF/c
ɔ:r	PAH/a
ul	ESF/d
ura/ula	BOS/a
tu	HIG/d
ku	MOR/g
kod	MOR/h
ʔɔse	KOI/f1
ko:sʌ	KOI/f11
qsə	KOI/f11
koutsə	KOI/f111
kousə	KOI/f111
koe	KOI/d1
ho	TEB/b,c;BIN/c
jo	BIN/c,f

¹This set contains cognates distributed widely throughout central and western Papua including the Teberan (TEB) Family inland of the heel of the Gulf of Papua.

2. geru ¹	MAB
neru	ETF/d
vřəv	ETF/b
galue	ETF/a
garu	II/Yoba;III/a11
galu	II/Bina;III/av111
khali	V/m,s
ga.lu	V/n

¹An interesting set with cognates occurring in NAN languages in western Papua and AN languages of south-east Papua.

3. hiya ¹	ESF/a
diy	ESF/b
hiyani	ESF/c
iyaki	WKU/c
iyo	UBP/a
iyao	TUR/a
iʔo	TUR
io	TUR

¹This set contains cognates limited to western Papua.

4.	yapu ¹	BIN/d
	yapimek	GOI/a
	yabi	GOI/a
	yap	GOI/b
	apir(i), apira	GOI/c
	afiri	GOI/c
	apiu	GOI/c
	japu	GOI/c
	tæbe	GOI/e (Karukaru)
	yaup	DAG/a, ai
	yaop	DAG/ai
	ioup	DAG/ai
	youp	DAG/a11
	eoup	DAG/a11
	yaup	DAG/b
	yopu	DAG/c
	yabu	DAG/f
	yup	DAG/g
	iubim	DAG/g

¹A widely distributed set in central and south-east Papua. Cf. the following kindly supplied by Dr K.J. Franklin from NAN languages of the central highlands of New Guinea: yáán (Agarabi), sàáká (Binumaria), sah? (Awa), taa'a (Auyana), yabuwe (Fore), áfó (Siane), vafora (Kamano), yafi (Benabena), ya?i (Gadsup), zahi? (Gahuku), yofia (Kanite).

5.	ahe ¹	TAT;ELE/a,c
	ase	BOS/c;ELE/c
	ae	BAI
	aihe	ELE/a
	ai	GOG
	tai?	WIR

¹One of the few sets containing cognates from Eleman (ELE) languages and Tate (TAT) of the Gulf of Papua.

6.	ara(ha) ¹	MAN/b
	areha	MAN/a,b
	karada	BIN/l(Foru),m
	ale	GOI/e

¹This set contains cognates scattered throughout central and south-east Papua.

Sugarcane

7.	tohu ¹	UBP/b;KAI;PM
	?ou	MAI/a,b,ci-xii,e
	tou	DOG;MAIS
	touyi	MAIS
	jabu	BIN/b,(i?)
	jou	BIN/g,h,j
	zou	BIN/a
	do?u	BIN/d
	dom/dou	BIN/e
	dzobu	BIN/g,k,n
	zovu	BIN/h,l
	dzou	BIN/i
	o-u	MAI/c
	dou	BIN/e
	tohu	II/a;V/p,u
	tebo	II/Magori
	touvu	V/a
	tou	V/b,f,IX/c,d
	toubu	V/i
	tovu	VII/b
	tomu	VII/c;VIII/c
	tom	VII/c;VIII/b
	tu ^{wo}	X/c
	ovu	II/cv,vi,vii
	obu	II/cix
	tihu	V/r
	komu	II/bi,bii,biii,bv,bvi,bvii,bviii,bx,bxvi;II/ci,ciii
	?omu	II/civ
	rou	TUR/b
	you	TUR/c

¹ Reflexes of *tovu (MN-Chowning), *topu (OC-Grace), *tebuSe (PAN-Dyen), and *təbu (PAN-Dempwolff) *sugarcane*. Cognates widely distributed throughout most AN and NAN languages of central and western Papua.

8.	pfimək ^{1,2}	BOA/a11
	fima(k)	BOA/a111
	fimaka	BOA/b1
	fimeka	BOA/b11
	maki/magi	EKU/a

¹ A restricted set limited to two language families of western Papua.

²(p)fi-. No apparent cognates have been located so far.

- | | | |
|----|----------------------------------|--|
| 9. | daɗa
madaia
madaea
pada | MOR/e,f
KIW/a
KIW/a11
TUR;PAW |
|----|----------------------------------|--|

¹One of the few sets with cognates in Pawaian (PAW).

- | | | |
|-----|-------------------------------|----------------------------------|
| 10. | kwʌn
kwolo
kwano
kon | MOR/a
MOR/b
MOR/c
BOS/b |
|-----|-------------------------------|----------------------------------|

¹A small set limited to two widely separated language families of western Papua.

- | | | |
|-----|--|--|
| 11. | (h)ngwa
ngwa
ngwa?
nggwe?/ŋgwe?
mgwe
kngo | ANG/d
ANG/e
ANG/1
ANG/j
ANG/k
ANG/l |
| 12. | imi
ivi
imu
imoi
emoi
ime | KOI/a,b1,b11,c1-111,cv-v1
KOI/civ
KOI/di,d11
KOI/di(Emo)
KOI/di11
KOI/e |
| 13. | iawa
yava
yawau,iawuio
yabau
eva
afa | YAR/a11(Sth)
YAR/a,b
YAR/c
YAR/c
KWA/c
MAN/a |
| 14. | *kūn
*kweit | AWY(PA;PD)
OK(PMO) |
| 15. | ŋga
ga | APA/a,c
APA/b |

Sugarcane

- | | | |
|-----|---|--|
| 16. | kimnda
kinna
gima
kingwa | ANG/a
ANG/b
ANG/e
ANG/f |
| 17. | wali
waa
wad† | HIG/a,b (East)
HIG/b
HIG/c |
| 18. | opahe
oipoihi
opae | WAI
IPI
KIW/a11 |
| 19. | ha.i
ka?i
hagi | KWA/a
KWA/a
KWA/b |
| 20. | gauga
aue
aua | DAG/c
DAG/d
DAG/e1,e11 |
| 21. | ekeda
ke:pa }
ke.pa }
keketa
khikhhi, kiki | I/e
I/f
VI/bv1
X/a,d |
| 22. | gwetu
gwaito
gwatu
gwai.tu
gwaiku
gwaitu | V/d
V/k
V/l
V/o
V/q
V/t |
| 23. | keya
keya?
ke | VIII/e
VIII/e
DAG/h |
| 24. | taubea
taube | VIII/f1
VIII/f11,f111 |

Isolates

pukwaisi	BOG
səq/səy	WKU/a
gabo	TEB/a
amoro	KIW/c, TUR
ntɪ	ANG/h
piʔoke	ELE/f
soai/soʔoai	PAW
laeʔela	PUR
tuama/tuami/tuame	GOI/d
boko	YAR/d
sukono	TUR
mei	POR
yiɣ	MOR/1
anago	DAG/c
ganal	ANG/g
eni	I/a
obaʔoba	I/b
ʔobaʔoba	I/b
ovaʔova	I/b
mabua	I/c
ʔuna	II/Ouma
ndun	XII/a
vaʔari	III/a11
na.mA	III/c
munimuni	V/u
kama	I/a
ɾɔ	XI/a

¹gana. Cf. fence: set 3d.

10.2. DISCUSSION OF RESULTS

10.21. General

The results just presented show that there is a large number of words most commonly used throughout Papua to designate the foodstuffs and associated agricultural items under investigation which can be grouped into a number of apparent cognate sets of varying sizes. Some contain cognates distributed over a wide geographical area, others do not. Those which do may conveniently be referred to as MAJOR SETS and those that do not as MINOR SETS. In the lists given above major sets precede minor ones (and isolates) although there is not formal dividing line shown.¹

Nothing much can be said about minor sets and isolates. Being limited to closely related or neighbouring languages (in the case of minor sets) or to single languages (in the case of isolates) one cannot tell whether they represent local innovations or isolated cases of more widely distributed forms which for one reason or another were not included in the data used for this study. Some are obviously borrowings since they occur across major linguistic boundaries (e.g., the AN-NAN boundary) but these cases are of little interest compared with those of much wider distribution that occur in major sets. Consequently nothing further will be said of them except as individual cases are relevant to the discussion of major sets from time to time. The rest of the paper will therefore be concerned primarily with major sets.

In considering these I shall be attempting to determine, in the first instance, which sets represent borrowings and which, retentions, and then, as the next step, to see what can be said about the history of each item. In doing this I shall be concerned initially solely with

¹The following chart gives the relative numbers of each, however:

<u>ITEM</u>	<u>MAJOR SETS</u>	<u>MINOR SETS</u>	<u>ISOLATES</u>
<i>Garden</i>	10	17	33
<i>Fence</i>	11	5	9
<i>Sweet Potato</i>	16	9	24
<i>Taro</i>	25	15	36
<i>Yam</i>	19	23	51
<i>Banana</i>	15	15	31
<i>Sugarcane</i>	10	14	27
Total	105	98	211

the linguistic facts as distinct from the physical items they represent. That is, I shall first be seeking to establish whether the cognate sets represent borrowings or retentions before attempting to relate these findings to the present-day distribution of their referents. This is so because even though we know from other evidence that sweet potato, taro, yam and banana are introduced foodstuffs in Papua we cannot argue from that that the present-day words must also be borrowings, since many factors (e.g., word taboo, contact with others) may have intervened to change them. However, once we have established whether the forms represent borrowings or not we can then proceed to relate their histories to those of the present-day foodstuffs.

In attempting to achieve these aims it will be convenient to distinguish between formal, distributional and semantic aspects of the sets, that is, between the phonetic and morphological structure of the given vernacular forms, their geographic range and associated meanings. Of necessity each of these will be treated separately, and in that order, although all three are subtly interconnected (in that, for example, cognates vary formally and semantically over distance). However, to restore some balance to this discussion some historical reconstruction based on this interdependence will be attempted in the conclusion to this paper.

10.22. Formal Aspects of Major Sets

10.22.1. Phonetic

Under normal circumstances where one has cognates from most, if not all, languages in the area under investigation phonetic features represent the most reliable source of historical inference. However, in this study where there are a large number of languages involved compared with the small number of major sets with cognates scattered throughout the many languages it is not possible to establish sufficient sets of regular sound correspondences between languages to gain any reliable insight into historical processes.¹ Yet there is one feature which may be of some significance, and that is, that within individual cognate sets the differences between cognates is usually not great, even

¹See Appendix C which contains a listing of correspondences between word-initial sounds in at least five language families/areas in Papua and which may be taken to be representative of other sounds in different positions in the sets under consideration.

though cognates may be very widely separated geographically. Now if this means anything more than that the cognate sets are reflections of the method (for example, in that forms were not regarded as apparent cognates unless they were obviously very similar) it probably means that the forms represent loans rather than retentions, otherwise the different phonological histories of the many languages in Papua would surely have provided a much wider set of variations. However, even if one could accept this it would be something of a double-edged sword for the high degree of regularity in form does not enable one to say anything about whence the forms came and by what route.

In summary then, the phonetic features of the forms do not provide any conclusive evidence as to the status of the forms or their histories, although the general absence of progressive phonological differences between forms within sets over distance suggests borrowing, if it is not a reflection of the adopted method of choice of apparent cognates.

10.22.2. Morphological

As already noted in section 10.05. above many of the given vernacular forms are actually bimorphemic.¹ The following chart gives a listing of examples representative of the different cases found in the present data (including some from minor sets and isolates) except for doubtful ones like *mosela*, *kuta*, *kogau*, and *gona'a* which are discussed in notes to sweet potato: set 1, fence: set 1, garden: set 6, and fence: set 2 respectively. In this chart hyphens indicate both probable and certain morpheme boundaries even though in some cases (e.g., *kaire kuta sweet potato*) the forms are recorded as free forms in the cognate sets given in section 10.1. above.

¹At least one is tri-morphemic, viz. *ne ufurana garden* which is a combination of *ne*, *u-* and *-fura(na)*. For cognates and some discription see garden: set 2.

FORM	REFERENCE	FORM	REFERENCE
ba-buro	garden: 1	ki-bani	taro: 6
dzu-wore	garden: 1	sa-gani	taro: 7
ko-fura	garden: 1	elo-siveli	taro: 13
e-gelo	garden: 2	elo-maɖu	taro: 21
so-papo	garden: 3	ko-pare	taro: 39
go-gola	fence: 3c	tau-ʔera	yam: 2
xa-mbaro	fence: 4	koroma-kuta	yam: 10
va-bele	fence: 5	sin-kau	yam: 11
ku-r+ta	fence: 6		
a-kira	sweet potato: 2		
kaire-kuta	sweet potato: 3		
au-kava	sweet potato: 6		
kaua-mose	sweet potato: 6		
ini-veyu	sweet potato: 7		
gob-eʔu	sweet potato: 11		

The interesting thing about these is that only a limited number of morphemes seems to participate in this kind of compounding (the most common ones being variants of ko, kero, buru, hina, and kuta)¹ and that, furthermore, none of these compounds involves either *banana* or *sugarcane*. In other words whereas the principal staples are often described in terms of each other *banana* and *sugarcane* never are, though as we shall see later (in section 10.24.3.) *banana* does participate in semantic changes with other foodstuffs in certain areas, and names for sugarcane seem to have been loaned around even though the item itself is indigenous. The reasons for this dissimilarity across items must surely lie in the obvious differences between the physical, culinary, agricultural and other properties of the different crops. Thus banana and sugarcane do not resemble sweet potato, taro or yam in shape, taste, texture etc., are not principal staples, and do not need to be protected or tended in the same way that these principal staples do. However, this does not mean that all meanings of present-day forms for sweet potato, taro, yam, garden and fence are transparent, for they are not. For example, while baburo *garden* is easily seen to be a compound derived from the words for *taro* and *garden* respectively² in areas where it occurs it is difficult (from a semantic point of view) to see how something like

¹These are discussed further in section 10.24.2. below. But see Appendix E for cognates under *KAU, *KERO, *(T)ISIABURU, *HINA, and *KUTA respectively.

²See Appendix E for cognates under *BA and *(T)ISIABURU respectively.

kaua mose sweet potato derives from a combination of *kaua*, which when unqualified, refers today to *yam* (q.v. set 2) and *mose sweet potato* (q.v. set 1). Loaning and semantic shift are obviously involved although at this point it is difficult to see any pattern in the distribution of these but we shall return to this question again in section 10.24. below.

10.23. Distributional Aspects of Major Sets

The central feature of this aspect of major sets is that most cognates cluster in one of two broad areas: (i) western; and (ii) central and south-eastern Papua. The former includes all languages approximately west of the Kikori River in the Gulf of Papua, and the latter, languages approximately east of Port Moresby excluding Yele of Rossel Island but including the AN languages of area I just west of Port Moresby. Separating these areas and including Yele just mentioned are other areas in which cognates are only rarely found. These areas include languages around the Gulf of Papua and inland of it, all of which are genetically very isolated or only remotely related to other NAN languages of Papua.¹

Within these two broad areas of concentration the distribution of cognates per set falls into a number of recurrent patterns with coastal and inland components, the first four of which are in Western Papua and the remainder in Central and South-East Papua. These are:

1. A weak Torres Straits component extending south from the Papuan coast across the Torres Straits;
2. A Strong Kiwai coast component connecting coastal areas between West Irian and the heel of the Gulf of Papua;

¹Cf. the following table:

CODE	STATUS	MEMBER OF THE TRANS NEW GUINEA PHYLUM?
TEB	Stock-Level Family	Yes
ANG	Stock-Level Family	Yes
GOI	Stock-Level Family	Yes
PAW	Isolate	Yes
ELE	Phylum-Level Family	No
ROS	Yele-Solomons-West Stock Member	No
PUR	Isolate	No
TAT	Isolate	No

Note that only half of these are at present thought to belong to the Trans New Guinea Phylum.

3. A weak Fly-River component linking the Upper Fly, the Strickland, and Lake Murray areas with the south-west coast;
4. A very strong Turama-Kikori Rivers component linking the inland areas around Mt. Bosavi and the Southern Highlands with the Kiwai coastal component;
5. A very weak Hiri component connecting the Gulf of Papua with the central coast around Port Moresby;
6. A strong central and south coast component connecting the central and south coast with the Hiri component and the islands east of the mainland;
7. Various Trans-Owen Stanley components linking the Hiri and Central and South Coast components with the north coast.

Now if these components are compared with those of traditional trading routes outlined by McCarthy (1938-40) it will be found that the two correspond in all except one major respect, viz. that no Purari River component appears in the linguistic data corresponding to the trade route of the same name connecting the inland areas of the Gulf of the Papua with the coast. Disregarding this exception for the time being the reason for such a high correspondence in distributional patterns is either that the distribution of cognates has resulted from contact between languages along traditional trading routes, or that the distributions represent patterns of common retentions, which, for other reasons, just happen to be distributed in a way that coincides with trade routes. What evidence is there for choosing between these two?

Firstly there is the general fact that whereas cognates are found in neighbouring areas across genetically diverse languages borrowing is more probable than retention. However, even though this applies well to many of the patterns just listed¹ it does not apply to all, for example, the Kolarian (KOI), Yareban (YAR), and Dagan (DAG) language families of south-east Papua which span the 'tail' of Papua - see map 7. Hence the principle provides only weak support for borrowing versus retention in this case. However, further support is to be found in the distribution of PAN reflexes in Papua.² If these are examined as a separate subset they will be found to be distributed in precisely the same way as cognates of other sets, and since we know that wherever PAN reflexes occur in NAN languages they must have been borrowed at some

¹Cf. map 7 and Appendix B.

²See Appendix D.

time from some AN source it can be safely claimed that the cultural events we are dealing with are borrowings (and therefore 'cultural' in the sense defined in the beginning of this paper) and not retentions. In recognition of this then, and for convenience, I shall henceforth refer to the areas of concentration of cognates and their internal patterned components described above as diffusion areas and diffusion routes respectively. These areas are shown on map 8.

Before leaving this section, however, there are two further points which need to be considered and to which I now turn.

The first has to do with the connection between the two diffusion areas, and the second with the Purari trade route mentioned earlier.

With respect to the first it is to be noted that many cognate sets have members appearing in both diffusion areas, the highest correspondence being between the Trans-Fly Stock languages (especially the Kiwai Family) and languages in central Papua (notably Binanderean languages and AN languages of area II). This connection is surprising in view of the fact that many of the cognate sets concerned are PAN ones (notably groups 1,2,3, and 5 of groups 1,2,3,5,6,7,8 in Appendix E) and that the two areas are separated by a large non-diffusion area around the Gulf of Papua. The reasons for this correspondence are probably complex but amongst them are probably to be numbered the following:

(a) One is that the cognates were borrowed from Hiri (or Police) Motu, the common lingua franca of mainland Papua. If so this must have been very recent since this lingua franca has only spread to western Papua since *Pax Australiana*. Moreover, it cannot be true for all items since there are cases like kamara *sweet potato*, anega *taro* and wara *fence* in western Papua which are not, and as far as is known have not been, part of Hiri Motu vocabulary.¹

(b) Another explanation might be that these items were distributed via trading links around the Gulf of Papua but have now been lost from those languages.² But why should this be so? Could it be that the selected items under consideration were not culturally important to the

¹Unfortunately there are no early records of the content of Hiri Motu except for a short wordlist published by Barton (1910), in which, however, only *taro* (which is glossed therein as *toera*) of this set appears.

²The only PAN reflex that occurs in Gulf languages is mao *sweet potato* (in PUR) (<*mao *taro* (MN-Chowning); or * η mao *taro* (OMA-Grace)).

Gulf peoples who may merely have acted as intermediaries in distributing these items but who never retained any of the names for the items themselves? Unlikely, but perhaps if one considered pottery and say, sago, the principal items of trade in this area, the picture may be different;

(c) A third but very weak hypothesis is that the words came from different but related sources into both areas - those in the west from Indonesia via West Irian and those in the east via AN languages;

(d) Perhaps there was closer direct contact between western Papuans and the AN's of the central coast by way of trading voyages across the Gulf of Papua, for example, which have never been recorded or are now lost to memory;

(e) Finally, could some of the AN's of Central and South-East Papua have come from Indonesia, as Capell (1943) has suggested,¹ into Papua via the Torres Straits touching western Papua before finally establishing themselves in approximately their present position. There is a lot that such a suggestion might explain² although it does not explain the recent items like kumara *sweet potato*. However, without further evidence from Eastern Indonesia (particularly between the Moluccas and Timor), for example, it cannot be profitably pursued here. Perhaps some or all of these explanations are involved.

Niether can much be said about the other cognate sets which have members in the east and west diffusion areas. Some of the same explanations possibly apply, others (like number 1 for example) obviously do not. We shall return to the question of direction of diffusion in the next section where semantic aspects of major sets are considered.

Meanwhile there is still the second point noted earlier to be considered, viz. the non-diffusion areas and the absence of a Purari River component in the linguistic evidence in particular. Part of the reason for this situation undoubtedly has to do with the fact, also noted earlier, that the languages in this area are linguistic isolates of one sort or another and that the area is sparsely populated by semi-nomadic groups. Part may also be, for example, that the languages in this area show connections in other directions, which, because this study

¹See discussion in section 10.04. above.

²For example, the claim by the Motu that they came from the west rather than the east; the establishment of the Hiri; the peculiarities of the Motu language in respect of other AN languages of Papua.

was limited to Papua, cannot be seen in the present data but which may appear if data from the Territory of New Guinea were included. However, if this is not the case, and if the non-appearance of cognates is indeed not because of the failure to recognise them, then the correspondence between this non-appearance and the genetic isolation of these languages becomes more significant. Could it be that these languages represent relatively recent arrivals (probably from the central highlands to the north) into areas until then relatively unpopulated? But even so it is strange that there is virtually no evidence of a Purari River trading route component in the present data. Perhaps this is to be explained by the nature of the data used in this survey or by the nature of the terrain, which is notoriously difficult, although it is hard to see why this should interfere with the borrowing of linguistic items when it does not seem to have affected trading in non-linguistic ones.

In review then I think it can be safely said that the results of the investigation so far indicate that there are two diffusion areas of foodstuffs in Papua - one in western Papua and the other in central and south-east Papua - within which the diffusion of items has been along the major traditional trading routes, although we are not able to say anything yet about the direction of movement along these. There are, however, still the semantic aspects to be considered which may be able to throw some light on this question.

10.24. Semantic Aspects of Major Sets: Appendix E

One of the other most noticeable things about many major (and some minor) cognate sets is that they cross item boundaries, that is, related forms appear in different languages as labels for different items. Sometimes these related forms merely refer to different species of the same genera, e.g., maho (<*mao taro (MN-Chowning)) in different parts of the Rigo area just east of Port Moresby may refer to either of two species of yam *dioscorea esculenta* or *d.elata*,¹ but generally they extend well beyond that. A complete listing of these sets is given in Appendix E.

Much of the information contained in this Appendix can be summarised

¹ Although this is the simplest case it amply illustrates the point made earlier that the full distribution of cognates cannot be known until such times as all species names or folk taxa are included in the data.

as a table of features of the following form which will serve to begin more detailed discussion of the characteristics of the semantic changes undergone by reflexes of established or proposed protoforms throughout Papua. In this chart, as in the appendix, starred capitalised forms are used to represent tentative reconstructed protoforms for those sets for which there are no previous established or proposed reconstructions.

Semantic Features of Cognate Sets That Cross Item Boundaries

Group Number	Proto-Form	Cognate Meanings						Notes	
		garden fence	sweet potato	yam taro	banana	sugarcane			
1	*kumara	x	x	x				Reflex of PN <i>sweet potato</i>	
2	*kale		x	x	x			Reflex of MN <i>taro</i>	
3	*mao		x	x				Reflex of MN <i>taro</i>	
4	*kubi	x	x	x	x	x		Reflex of PAN <i>yam</i>	
5	*kani			x	x	x		Reflex of OC <i>food, to eat</i>	
6	*(T)ISIABURU	x	x	x	x	x			
7	*KERO	x		x	x	x			
8	*(M)BERE	x	x		x	x			
9	*KAU	x		x	x	x			
10	*KUTA		(x?)	x		x			
11	*KARA	x	x						
12	*(KI)BANI				x	x			
13	*HINA			x		x			
14	*ADARI			x	x				
15	*WAIA			x		x			
16	*KOKIA			x	x				
17	*HAGO				x	x	x		
18	*BA	x			x				
TOTAL:		10	5/6?	12	12	14	3	0	

To begin with it is clear from this chart that the items garden, fence, sweet potato, taro, and yam regularly occur together or in groups in a way that banana and sugarcane do not. In fact sugarcane stands out from all the rest in being totally independent - reflexes of protoforms

for it never appears as anything other than 'sugarcane'. Thus the generalisation to be made here seems to be that whereas the principal staples and associated agricultural terms fluctuate in an integrated way the words for the supplementary foodstuffs do not (in the case of sugarcane) or do so only marginally (in the case of banana).¹ The question then arises, what are the determinants, if any, of this fluctuation, and what can it tell us about the diffusion of these items across Papua? In seeking to answer these questions, of course, we shall need to look at the semantic changes to see what kind of hypothesis allows for the explanation of the changes, e.g., Is there a consistent sequence of change from item to item and/or from language to language?; How do these relate to the distribution of present-day staples? The items will be treated in the following natural groupings: associated agricultural items; principal staples and supplementary foodstuffs.

10.24.1. Associated Agricultural Terms: Garden and Fence

These two items occur together as sole members of group 11(*KARA), together with other items in groups 6>(*T)ISIABURU), 8>(*M)BERE), 9(*KAU), and 18(*BA), and individually in others, notably groups 1(*kumara), 4(*kubi), 7(*KERO), 14(*ADARI), and 15(*WAIA) for *garden* and group 10(*KUTA) for *fence* though this last case can be discounted because it is a doubtful one.

Taking these in turn the following are relevant observations regarding the semantic and formal relationships between these items and others:

1. In group 11 it is clear that the meaning *garden* is restricted to one dialect of Suau and to a few dialects of the closely related and neighbouring AN languages Sinagoro and Keapara of central and south-east Papua. Hence *garden* most probably represents a change of meaning in those areas (unless both are independent extensions of some other meaning not yet recorded), so that it is legitimate to assign the proto-meaning *fence* to *KARA until such times as any counter evidence becomes available.
2. In groups 6,8,9 and 18 the first pair 6 and 8 and the second pair 9 and 18 fall together as parallel cases.

In groups 6 and 8 there is no evidence for choosing between various hypotheses as to the primacy of the meanings *garden*, *fence*. Although

¹Note the parallelism between this aspect of the sets and the morphological structure of *banana* and *sugarcane* discussed in section 10.22.2. above.

both are obviously derived from or associated with (in a way that will be discussed further in paragraph 3 below) from the names of the principal foodstuffs sweet potato, taro and yam there is no evidence to indicate whether these changes are real, and if they are, whether they are independent or connected.

In groups 9 and 18 forms for *garden* and *fence* are all compounds (e.g., *baburo garden* in group 18 is really a combination of *ba taro* and *buro garden*) so that there is no argument.

3. In groups 1,4,7,14, and 15 the given meaning *garden* is always restricted geographically either to one language or to two closely related and/or neighbouring languages, which suggests that either such changes are very recent or that the information is misleading in some way. For example, might it not be the case that the given meaning *garden* really represents an abbreviation or shorthand form for a longer one such as *sweet potato garden*, *taro garden* or *yam garden* since we know, at least for some areas of Papua, that speakers frequently do just that. For example, it is common in Mountain Koiari for speakers to say merely that they are going to the *lovi* (lit. *yam* or *yams*) as a short form of saying they are going to the *lovi buru* (lit. *yam(s) garden*) which they will produce if pressed. Indeed some confirmation of these suspicions is provided by the forms *asadl*, *avasl* given for *garden* and *atari*, *adari*, *adarA*, *adang* given for *sweet potato* and *atari* for *taro* in the same language (GOI/c) in group 14. Under these circumstances, where the data is uncertain, it would be unwise to pursue a treatment of semantic change any further until such times as the data can be checked or added to. By the same token, however, given this kind of abbreviating principle or tendency it is quite reasonable to expect changes over time of the form: principle crop + garden/fence. In fact such a principle is the only one which explains the present-day distribution of many words of the form BURU discussed further in Section 10.24.22 (2) below as given names for *garden* in areas where there is no related word for sweet potato, taro, and yam.

In review then it is clear that there is little evidence regarding changes in meaning involving the agricultural terms *garden* and *fence*. Although there is obviously a close association between gardens and fences and the crops they contain or protect there is no clear evidence to indicate whether semantic changes have occurred in the forms discussed here and if so whether these have been from *garden* to *fence*, or vice versa, or from principal crop to each independently. In only two cases

is it possible to suggest some sort of historical development. One of those is *KARA which is evidently a proto-form for *fence*, reflexes of which now refer to *garden* in certain dialects of three AN languages in central and south-east Papua. The other is BURU which represents a development from *(T)ISIABURU *sweet potato* discussed further below which split into two parts representable as (T)ISIA or BURU which were reapplied to *taro* and *yam* and eventually to *garden* in some areas where there is no linguistic connection between this form and present-day (given) forms for *taro* and *yam*.

10.24.2. Principal Staples: Sweet Potato, Taro, Yam

Here there are four different cases covering all possible combinations of each item with every other taken two and three at a time:

Case	Items	Examples
A	taro, yam	5,8,12,17
B	taro, sweet potato	14,16
C	yam, sweet potato	1,3,10,13,15
D	taro, yam, sweet potato	2,4,6,7,9

In discussing these Case A will be treated separately from Cases B, C and D since the latter all contain the item *sweet potato*, which, for historical reasons, has an important bearing on the interpretation of the linguistic facts. Moreover, examples, 12 and 14 have to be disregarded since each contains cognates from the same language with different meanings and since it is not possible to tell whether these differences represent dialect differences or recording errors these examples will be regarded as unreliable.

10.24.21. Case A

(1) Example 5

This contains reflexes of PAN *kani *food, to eat* distributed throughout AN languages in central and south-east Papua as *yam* and throughout NAN languages in western and south-eastern Papua as *taro*.¹ However, while the change PAN *food, to eat* → *taro, yam* represents an understandable narrowing of meaning in areas where taro and yam are principal

¹They also occur as names for *banana* and *food* in south-east Papua but these are not relevant here. See section 10.24.3.

staples there is nothing in the evidence to indicate where these changes occurred or whether they represent independent or connected ones.

(2) Example 8

This contains reflexes of some proto-form **(M)BERE* which are structurally and distributionally as variance with each other. Structurally the forms meaning *yam* are derived from some other meaning whereas the forms meaning *taro* are (excepting *tebele*) monomorphemic suggesting that *taro* is perhaps the primary meaning. Distributionally, however, the forms meaning *taro* are only found in a restricted area of western Papua (excepting *tebele* which occurs in one language of south-east Papua) suggesting that either the meaning *taro* is purely a local development and therefore not the primary meaning, or that the meaning *taro* has for some reason been retained only in this small pocket of Papua. The issue is unresolvable without recourse to other linguistic and/or historical information.

(3) Example 17

This is a simpler case than example 8 in that there are no bimorphemic cognates involved. By the same token, however, there are no purely linguistic indications of which of the two meanings *taro* and *yam* represents the probable primary meaning of the forms and which represents the changes. Consequently nothing further can be said without further information.

In summary then there is nothing in the evidence of Case A to indicate the historical precedence of *taro* over *yam* or vice versa or to indicate why forms have changed meaning in different areas.

10.24.22. Cases B, C, and D

In the forthcoming discussion examples 1-4, which involve PAN reflexes, will be treated separately from all others.

(1) Examples 1-4

The semantic changes observable here can be schematised as follows:

Example	PAN Meaning	Meaning in Papua
1	sweet potato	sweet potato, yam
2	taro	sweet potato, taro, yam
3	taro	sweet potato, taro, yam
4	yam	sweet potato, taro, yam

From this chart it is apparent that each item has undergone similar kinds of semantic shifts. However, more detailed investigation of the nature and distribution of these shifts reveals wide variation. Thus taking each in turn:

(a) In example 1 PAN *sweet potato* is reflected as *sweet potato* in many parts of Papua and as *yam* in a few neighbouring NAN languages of central Papua. This distribution coincides well with the present-day distribution of sweet potato and yam as principal staples and therefore suggests: (i) that the variety of sweet potato represented by *kumara entered Papua from some AN source, probably in the east, and (ii) that the change *sweet potato* + *yam* must represent a late one if the sweet potato was indeed only recently introduced into Papua New Guinea (see section 10.02.).

(b) In example 2 the meaning *taro* is restricted to AN and neighbouring NAN languages whereas the meaning *yam* and *sweet potato* are widespread. In short, there is no consistent correlation between the distribution of these forms and those in example 1 nor with the present-day geographic distribution of principal food sources.

(c) In example 3 the change PAN *taro* + *yam* corresponds broadly with the same change in example 2 suggesting that there are similar underlying reasons for such a change though these reasons are not apparent in the data so far. On the other hand only one occurrence of PAN *taro* + *sweet potato* is recorded which contrasts markedly with the relatively large numbers in example 2.

(d) In example 4 PAN *yam* is reflected as *yam* in only a very small area of eastern Papua (VII/c, VIII/c, IX/d, DOG), as *taro* in only one language (GOI/d), and as *sweet potato* in neighbouring NAN languages in central Papua. Thus, leaving aside the one example of *taro* (which may be a recording error) the change PAN *yam* + *sweet potato* must be a subsequent development after reflexes of *kubi appeared in Papua and this development must have occurred somewhere in central Papua where yam is a principal staple. That is, there is some agreement between this example

and example 1 though the direction of change is the reverse, i.e., *yam* → *sweet potato* here as against *sweet potato* → *yam* in example 1.

Thus in review the situation appears generally to be as follows: out of the many PAN protoforms that are reflected in Papua (see Appendix D) two (example 2 and 3) have undergone semantic changes which are unsystematic, i.e., are unrelated to the present-day distribution of principal food sources while two are systematic but opposing in terms of the direction of change, suggesting that different time periods are probably involved. As the same time it seems that, if the name of an item can be said to be introduced with the item, many items have probably been introduced to NAN languages in Papua via AN languages of south-east Papua.

(2) The Remaining Examples in Cases B, C, and D

These are examples 6,7,9,10,13,15, and 16. Of these three - 9,10,13 - can be disposed of immediately since the information in these is very much the same as that discussed in section 10.22.2. above where it was noted that the forms for *sweet potato* are often bimorphemic and based on a common form for *yam*. Compare, for example, the following ranges of variants in which common elements are underlined:

Example	Yam	Sweet Potato	Taro
9 *KAU	kau, au, lau	<u>au</u> kava, <u>kau</u> a mose, <u>au</u> kapa, <u>ak</u> ira	<u>ko</u> pare, <u>sapa</u> ru, <u>saga</u> ni
10 *KUTA	kuta, uta, ua	kairek <u>uta</u> , <u>ku</u> :tazi	--
13 *HINA	sina, <u>san</u> aru, sini, <u>ki</u> ni	hina, <u>ina</u> so, <u>inive</u> yu, <u>iniveu</u> (da)	--

In the present case, however, it is to be noted that the semantic changes involving *yam* and *sweet potato* are haphazard, that is, the same changes do not regularly occur in the same place, so that it is difficult to relate these changes to any influencing factor. Consequently nothing further can be said about these examples. We return therefore to the remaining examples, viz. 6,7,15,16.

In these there is a variety of evidence which is in general agreement despite variations in the quality of the data. For example, in example 6, there is a complex of forms which appear to be related by virtue of the fact that the smaller forms (which for arguments sake will be represented as (T)ISIA and BURU) can be identified as parts of a larger

form tentatively reconstructed as *(T)ISIABURU. Distributionally and semantically these forms have the following characteristics:

- (i) reflexes of the full form *(T)ISIABURU occur as words for *sweet potato* in NAN languages of the "Bird's Head" area of West Irian and the southern highlands of north-west Papua, and as the word for *garden* in a Binanderean language of north-east Papua;
- (ii) reflexes of the part (T)ISIA occur as *taro* in south-east Papua (BIN, DOG, KOI, II) and in north-east Papua in one isolated instance (ESF);
- (iii) reflexes of the part BURU occur
 - (a) as *garden* in central and south-east Papua with sporadic occurrences also in western Papua (KIW) and in the Gulf of Papua (ELE, TAT);
 - (b) as *fence* in a restricted area of north-east Papua (BIN, VIII);
 - (c) as *yam* in central and south-east Papua but with some sporadic occurrences in western Papua (ETF, TEB) and the Gulf (ELE, TAT);
 - (d) as *taro* in two isolated cases in south-east Papua (II, V).

Such a distribution of forms and meanings may be explained by any one of a number of hypotheses. However, that which most easily and naturally explains this distribution in terms of the historical record as far as this is known is that which sees the smaller forms as different remnants of the larger one in different areas. That is, it claims that a form something like *(T)ISIABURU denoting one variety of sweet potato entered north-west Papua from West Irian (and ultimately Indonesia, where it will be recalled (see section 10.02.) that the sweet potato is thought to have been introduced by the Portuguese in the sixteenth century), and spread into south-west Papua via the mountainous backbone where it split into (T)ISIA and BURU as names for *taro* and *yam* in areas where sweet potato has not become the principal staple. Furthermore, the split into (T)ISIA and BURU must have been subsequent to the spread of the full form since the full form occurs in one area of south-east Papua as the word for *garden*. If the change *sweet potato* → *garden* represents a subsequent development as was suggested in section 10.24. above then reflexes of *(T)ISIABURU must have spread to at least the north coast of south-east Papua as *sweet potato* before being reapplied as the word *garden*, and before splitting into the two elements (T)ISIA and BURU. Moreover, the passage of *(T)ISIABURU into Papua via west Irian must have been south or north of the central highlands of New Guinea as no reflexes of this form have been recorded in that area despite the fact

that sweet potato is the principal staple there.¹ If south, then one has to ask how the forms got into south-east Papua across the non-culture area around the Gulf of Papua without trace. If north, then one can expect to find traces of it in languages of the Morobe District along the Papuan border to the north when more data is taken into account.

Irrespective of these problems, however, a hypothesis of the form *sweet potato* + *taro*, *yam* (as one moves from north-west to south-east) will generally be found to satisfy the remaining examples 7,15 and 16 in this subsection, although there are exceptions which should be considered if the data were more complete. However, attempts to correlate each change with individual languages fails because no pattern emerges, that is, the same changes do not occur in the same place.

In summary then there is a variety of evidence in this subsection that suggests that the sweet potato spread into Papua mainly, but not exclusively, from the north-west via West Irian, some having entered from AN areas probably from the east. Moreover, this spread must have been rapid and the impact great judging by the completeness of the spread in the several hundred years since the sweet potato is thought to have been introduced into Indonesia, as well as by the number of semantic changes that have occurred involving this item and others, including *garden* and *fence*. Moreover, the spread must have been accompanied by multiple independent developments since attempts to correlated changes with individual languages of language families or areas failed although there are individual cases of correlations between various semantic readings of forms and present-day distributions of principal staples, particularly *yam* and *sweet potato*. Yet the data raises many problems and leaves many questions unanswered that should be investigated when more data becomes available.

10.24.3. Supplementary Foodstuffs: Banana and Sugarcane

As already noted these two items participate only marginally (in the case of banana) or not at all (in the case of sugarcane) in semantic changes across item boundaries. That is, the names of the supplementary foodstuffs tend to be stable except where they approach principal staple status. When this happens the name will be found to fluctuate with those

¹We also know that the sweet potato is just reaching some northern parts of the area that borders on the central highlands of New Guinea so that it does not seem to have passed that way either. See for example, Sorenson (1972).

of the principal staples with which it comes into competition.¹ For example, in the present data *banana* will be found to alternate with *yam* and *taro* in each group of cognates in which it occurs with them (viz. (4) *kubi PAN *yam*, (5) *kani PAN *food, to eat*, and (17) *HAGO) and in those areas of Papua where the banana is an important foodsource, notably in central and south-east Papua south of the main range. It does not fluctuate with *sweet potato* because sweet potato has not yet become an important foodsource in much of this area.

Sugarcane, on the other hand, nowhere approaches principal staple status and has no real competitor so that its name is never found alternating with that of principal staples (or any other foodstuff for that matter). It nevertheless shows the same diffusion pattern as the principal staples and is therefore cultural in the same sense. Thus it appears to be the case that sugarcane has been traded about in much the same way as other items despite the fact that it is believed to be indigenous.

In summary then the evidence in this subsection seems to indicate that there is a general principle underlying the semantic changes that have been discussed throughout this section which may be briefly stated as follows: wherever a foodstuff comes into competition with another either as a principal or supplementary foodsource its name will be found to fluctuate with the name for the competing item or items. Banana and sugarcane are good examples of this. Thus the names for both are generally stable - that is, they always refer to these items wherever they are found - except where banana comes into competition with taro and yam as principal foodsources in parts of central and south-east Papua. Of course such a principle merely summarises the agreements noted between distributions of foodsources and the names used to identify them. It does not explain how, when, or where these changes occurred though we do have a general idea of the sequences of events that have

¹Somewhat the same observations have been made by Chowning (1963:42) with respect to sugarcane, Derris, the putty nut throughout island Melanesia though she uses the term "stable" in a different sense. Cf. the following:

the names of the plants other than the starch staples tend to be stable - that is, to remain the same in related languages - as long as the plant itself is regarded and used in the same way by the speakers of those languages. Thus the comparative stability of the names for sugarcane, Derris, and putty nut would result from their consistent and virtually exclusive use throughout Melanesia, for, respectively, refreshment, fish poison and canoe caulking.

been involved in these changes. These may be briefly set out as follows:

(i) Taro and yam, and in some areas banana, where basic foodstuffs throughout Papua until the arrival of sweet potato; sugarcane never has been;

(ii) Gardening has long been associated with the cultivation of yam and taro;

(iii) The sweet potato is a recent arrival from the north-west and has become the principal staple in many areas but even in those areas where it has not it has provided many new names for gardens and fences;

(iv) All items have been traded throughout Papua (except for the area around and inland of the Gulf of Papua) in much the same way though this diffusion has been anything but unidirectional.

10.3. CONCLUSION

In this paper I have taken a set of vocabulary normally regarded as borrowed and examined it systematically to see whether the suspicions held about it are justified and then to see what other conclusions can be drawn from the collected data. In the process I have come to the conclusion that all except those individual forms or small sets of related ones which are restricted to single languages or to members of language families or neighbouring languages (herein labelled isolates and minor cognate sets respectively) are borrowed and are therefore justifiably regarded as "cultural" in the sense defined.

In general related names for these items were found to be concentrated in two main areas - western, and central and south-east Papua - separated by a large non-diffusion, or culturally isolated area around and inland of the Gulf of Papua (map 8).¹ Within these areas the names were found to be distributed in a way that is consistent with most of the known regular traditional intertribal trading routes although there is little clear evidence of the direction of movement along or between these, except for isolated cases that are referred to further below. Indeed the evidence seems to point to borrowing and loaning being multidirectional and not restricted to any one route or period of time. The distribution also raised the question of why the languages around the Gulf of Papua and inland of it do not show more evidence of contact with either east or west since there is a noticeable connection between the two diffusion areas involving, particularly, coastal languages from around the south-east corner of western Papua and many languages of central Papua across

¹See section 10.23. for details underlying the discussion in this paragraph.

this very same Gulf, and especially since we also know that at least some of the coastal languages from around the Gulf of Papua have been in regular contact with traders like the Motu from central Papua for a long time. Various possible explanations for this situation were discussed but there seemed to be no support for any one hypothesis over another so that the question remains open for further investigation.

As far as the history of individual items themselves was concerned the data turned out to be very difficult to interpret, principally because much of it was too sketchy to gain any insight into the sound changes that had occurred between different areas, and, consequently, into the historical connections between similar forms in different places (see section 10.22.). In other respects, however, the data revealed glimpses of regular processes at work which have produced many inter-connecting series of cognates. Thus, for example, it was noted that the names for the principal staples sweet potato, taro, and yam were very unstable (in the sense that the same form will be found to refer to different items in different areas) but that this instability (wherever it could be interpreted) seemed to be related to the recent introduction of sweet potato and the present-day distribution of these staples. Thus it seems to be the case that wherever sweet potato has become an important foodstuff it has generally resulted in the spread of new names for yam especially, but also taro, elsewhere, where these are still important foodstuffs, as was noted in the *(T)ISIABURU example discussed at some length (see section 10.24.2.). Much the same was also noted for banana in central and south-east Papua though in a much more limited way. Sugarcane, on the other hand, is very stable though still loaned and borrowed and is never associated with gardens and fences as the principal staples are (see section 10.24.1.), probably because it was indigenous and did not require protection and special tending as the principal staples do. Thus the evidence seems to indicate that wherever a foodstuff has come into competition with another either as a principle or supplementary food-source its name will be found to fluctuate with the name for the competing item or items.

At the same time the evidence seems to indicate that yam and taro on the one hand, and sugarcane on the other, have been important basic, though complementary foodstuffs in Papua for a long time (at least out of the items considered here). Gardening and fencing have also obviously been long associated with the cultivation of yam and taro (and later sweet potato) since the names for these foodstuffs have gradually become the

names for their associated protective and fostering items. However, there is, as yet, no indication of which of yam or taro is primary in time, or indeed, if either is, nor whence they came, except that some were probably introduced from AN areas probably in the east.

More recently the sweet potato has entered the scene and replaced the staples yam and taro in many areas as principal staple with linguistic consequences already outlined. This entry seems to have been mainly, but not exclusively, from the north-west via West Irian and the regular trading routes, although it is still not clear why few traces of this entry are found in vocabularies of languages of the central highlands of New Guinea where the sweet potato is the principal staple, or in languages of the non-diffusion area around the Gulf of Papua. Some also entered from AN areas probably in the east though this does not appear to be very important and the varieties represented by the cognate sets in this data do not appear to have established themselves very strongly, especially in central Papua, where the banana is an important staple. However, irrespective of the uncertainties surrounding the details of the direction of spread the spread itself must have been rapid and the impact great judging by the completeness of the spread in the several hundred years since the sweet potato is thought to have been introduced into Indonesia, as well as by the number of semantic changes that have occurred involving this item and others, including *garden* and *fence* (see section 10.24.2.).

Finally gardening and fencing were found to be closely associated with the cultivation of the principal foodstuffs sweet potato, taro and yam and the names of these are often given as the names for their associated protective and fostering items. In one case in particular, this association has resulted in a semantic change such that words for garden will be found in many areas to be reflexes of *(T)ISIABURU *sweet potato* where there are no reflexes of this form used as present-day names for either yam, taro or sweet potato.

In conclusion then it is clear that while this survey has provided some insight into the history of some present-day names for the items studied here throughout the Gulf and other districts of Papua, it is also equally clear that much more could probably be said given information of the right kind. However, these results are not likely to be achieved lightly. Thus it is apparent from this study that efforts should be concentrated on detailed separate accounts of individual items or sets of related ones (in terms of function, use, appearance to members of user

societies etc.) over a wide area, including especially eastern Indonesia which is a well known important centre of distribution for most indigenous economically important plants and foodstuffs in Papua New Guinea today. In such studies, however, one should be prepared to collect not only vernacular forms for as many varieties of the item under investigation as possible, but also those for those items which could possibly be, or have been demonstrated in this study to be, regarded as so related. For the starch staples this is likely to run into many hundreds of forms, but for others, like pig, for example, the range is likely to be very much smaller (e.g., village/tame/exchange versus wild/bush). Ideally too such studies should incorporate the more durable items of trade (e.g., pots, shells, axes, betelnut, sago etc.) and/or other items which are known to have been recently introduced (e.g., cassava, pawpaw, corn, fowl, tobacco etc.) and must inevitably involve other disciplines, but only in this detailed and co-ordinated way will it be possible to gain real insights into the culture history of Papua New Guinea today.

APPENDIX A

PHONOLOGICAL CHARACTERISTICS OF AN AND NAN LANGUAGES OF PAPUA¹

1. AN Languages

These are all very simple and uniform. They are characterised by open syllables, predictable stress on the second and third last syllables of words, the absence of consonant clusters and tone. Each has a five vowel system² (i,ε,a,ɔ,u) and a set of about fourteen consonants covering voiced and voiceless stops (p,t,k,ʔ,b,d,g), nasals (m,n,ŋ), fricatives (f,v,z,ɣ), a lateral (l) and/or vibrant (r), and semivowels y and w. Of these ŋ is rare (occurring only in Mekeo as a separate phoneme although phonetically as a homorganic nasal following stops in Misima and the Calvados Chain), l and n correspond across different languages, and l and r rarely contrast though they have become established in published materials of many of these languages as apparently different phonemes, as have t and s also. Finally, there is no prenasalisation in any of the languages though labialisation of stops and of the nasal m is common, e.g., Dobu *bwasi water*.

¹These notes are based on the following sources: Boxwell (1966), Capell (1943;1969), Dutton (1969;1970;1971), Franklin (1971;1972), Lloyd (1972), Murane (1967), Pence (1964), Trefry (1969), Voorhoeve (1970a;1970b), and Wurm (1971).

²Except for Sudest Island which has unrounded varieties of o and u which probably belong to a stratum of the language shared with Yele, the NAN language of Rossel Island.

2. NAN Languages

There is greater variety in these than in the AN languages. Generally their complexity increases as one moves from east to west and inland towards the central highlands. Thus the languages of the south-east tail of Papua are, overall, very similar to the surrounding AN languages except for occasionally slightly larger consonant inventories incorporating more fricatives and occasional extra vowels. The same is true of Kiwai languages in the far west and the Suki, Gogodala and Boazi languages around Lake Murray although these latter are complicated a little by consonant clusters and some sub-phonemic nasalisation. As one moves inland into the Ok, Awin-Pare, Highlands, Pawaian and Angan languages tone and nasalisation become more important although tone is also found in the Kiwai languages excepting Wabuda. However it is at the extremes of the division that the most complex phonological systems are found. Thus Yele on Rossel Island in the east has complex sets of consonants preceded by unexploded stops, palatal plosive clusters and long consonants, while the languages around the Oriomo, Pahoturi and Morehead Rivers in the far south-west corner have large phoneme inventories of up to thirty-four consonants (including palatalised, labialised and prenasalised series and additional fricatives), eleven vowels (including rounded and unrounded front and back sets), two tones and complex syllable structures.

APPENDIX B

LINGUISTIC GROUPINGS IN PAPUA

This appendix contains a complete listing of presently identified AN and NAN languages of Papua. In it NAN languages are presented first within family and other higher-level groupings. AN languages are listed within areal groupings. (See section 10.04.). Some dialects are also included. These are identified by small roman numerals. The location of all languages is shown on Map 7.

NAN Languages

1. (CENTRAL AND SOUTH NEW GUINEA STOCK¹ (Voorhoeve and McElhanon (1970:10))

(OK) Ok Family² (Voorhoeve and McElhanon (1970:10))

- a. Kati Ninati
- b. Kati Metomka
- c. Ningerum
- d. Yongom
- e. Mianmin
- f. Tifal
- g. Telefol
- h. Faiwol
- i. Bimin
- j. Kawwol

(APA) Awin-Pare Family (Voorhoeve and McElhanon (1970:10))

- a. Awin
- b. Pare (Pa, Ba)

¹Voorhoeve's BED Bedamini (Beami) Family of this stock is now Franklin's BOSAVIAN STOCK, and his KIWA I and other stocks superceded by Wurm's (1971) classification.

²Only languages c,d,h actually occur in Papua.

2. GOGODALA-SUKI STOCK (Voorhoeve and McElhanon (1970:10))

(GOG) Gogodala

(SUK) Suki

3. MARIND STOCK (Voorhoeve and McElhanon (1970:10))

(BOA) Boazi Family¹

a. Boazi

- 1. North
- 11. South
- 111. Kuini

b. Zimakani

- 1. Begua
- 11. Zimakani

4. TRANS-FLY STOCK (Wurm (1971))

(KIW) Kiwai Family²

a. South Kiwai

- 1. South
- 11. Island
- 111. Coastal
- 1v. South Coast
- v. East Coast
- vi. Daru

b. Wabuda

c. Bamu

d. Turama-Kerewo

- 1. Goari
- 11. Morigi³
- 111. Kerewo⁴

e. Urama-Gope

- 1. Urama-Gope
- 11. Urama
- 111. Gope

f. Anigibi⁵g. Gibaio⁵

¹There are two other member families in this stock - Marind and Yaqay - but these are not represented in Papua.

²Miriam was originally included in the Kiwai-Miriam stock in Voorhoeve and McElhanon (1970:10), but now included in Wurm (1971)'s East-Trans Fly Family.

³Misspelled in Wurm (1971)'s map. Also shown as a language (not dialect) in Franklin (1972).

⁴Also shown as a language (not dialect) in Franklin (1972).

⁵Two extra languages of the Kiwai Family shown in Franklin (1972).

(TIR) Tirio Family

- a. Tirio
- b. Aturu
- c. Lewada-Dewara
- d. Mutum (Paswam)

(ETF) Eastern-Trans Fly Family (Wurm (1971))

- a. Bine
- b. Gidra
- c. Gizra
- d. Miriam

(PAH) Pahoturi River Family (Wurm (1971))

- a. Agöb
- b. Idi

(MOR) Morehead and Upper Maro Rivers Family (Wurm (1971))

- a. Nambu
- b. Iauga (Parb)
- c. Dorro
- d. Upper Morehead (Rouku)
- e. Lower Morehead (Reremka)
- f. Tonda
- g. Kanum
- h. Yey
- i. Moraori

(MAB) Mabuiaq (Australian)**5. BOSAVIAN STOCK (Franklin (1972))****(ESF) East Strickland Family**

- a. Samo
- b. Kubo
- c. Bibo
- d. Honibo
- e. Tomu

(BOS) Bosavian Family

- a. Beami¹
- b. Kaluli²
- c. Kasua²
- d. Kware
- e. Waragu³
- f. Etoroi³

(BAI) Baiapi**6. KUTUBUAN STOCK (Franklin (1972))****(WKU) West Kutubuan Family**

- a. Fasu
- b. Some
- c. Namumi

(EKU) East Kutubuan Family

- a. Foe
- b. Fiwaga

7. INLAND GULF STOCK (Franklin (1971))**(UBP) Upper Bamu-Paibunan Family**

- a. Minanibai
- b. Tao-Suamato

(IPI) Ipiko**8. TURAMA-KIKORIAN STOCK (Franklin (1972))****(TUR) Turama-Omatian Family**

- a. Ikobi
- b. Omati
- c. Mena

(KAI) Kairi

¹= Voorhoeve and McElhanon (1970:10)'s Bedamini.

²One of these equals Voorhoeve and McElhanon (1970:10)'s Bosavi.

³These languages were only recently identified.

9. TEBERAN STOCK-LEVEL FAMILY (Wurm 1972))

(TEB) Teberan Family (Franklin (1972))

- a. Daribi
- b. Tebera
- c. Polopa

10. ANGAN STOCK (Wurm (1972))

(ANG) Angan Family (Franklin (1972))

- a. Simbari
- b. Baruya
- c. Ampale
- d. Kawacha
- e. Kamasa
- f. Menya
- g. Yagwoia
- h. Angaataha
- i. Ankave
- j. Ivori
- k. Lohiki
- l. Kapau

11. ELEMEN (or TOARIPI) PHYLUM-LEVEL FAMILY (Wurm (1972))

(ELE) Eleman Family (Franklin (1972))

- a. Haura (Orokolo)
- b. Opau
- c. Toaripi
- d. Kaipi
- e. Sepoe

12. HIGHLANDS STOCK (Franklin (1972))

(HIG) West-Central Family

- a. Sau
- b. Kewa
- c. Mendi
- d. Huli

13. GOILALAN STOCK-LEVEL FAMILY (Wurm (1972))

(GOI) Goilalan Family (Dutton (1971b))

- a. Biangai
- b. Weru
- c. Kunimaipa
- d. Tauade
- e. Fuyuge

14. KOIARI-MANUBARA-YAREBAN STOCK (Wurm 1972))

(KOI) Koiarian Family (Dutton (1971b))

- a. Koita
- b. Koiari
 - i. East
 - ii. West
- c. Mountain Koiari
 - i. Southern
 - ii. Central
 - iii. Western
 - iv. Northern
 - v. Eastern
 - vi. Lesser-Eastern
- d. Barai
 - i. North
 - ii. South
- e. Aomie
- f. Managalasi
 - i. East
 - ii. Central
 - iii. West

(KWA) Kwalean Family (Dutton (1971b))

- a. Humene
- b. Kwale
- c. Mulaha (Extinct)

(MAN) Manubaran Family (Dutton (1971b))

- a. Doromu
- b. Maria

(YAR) Yareban Family (Dutton (1971b))

- a. Abia
- b. Doriri
- c. Yareba
- d. Bariji

15. MAILUAN STOCK-LEVEL FAMILY (Wurm (1972))

(MAI) Mailuan Family (Dutton (1971b))

- a. Domu
- b. Morawa
- c. Binahari
 - i. Ma
 - ii. Neme
- d. Bauwaki

e. Mag1

- 1. Domara
- ii. Mailu Island
- iii. Borebo
- iv. Dereba1
- v. Asiaulo
- vi. Darava
- vii. Geagea
- viii. Ilai
- ix. Baibara
- x. Other islands
- xi. Gadaisu

16. DAGAN STOCK LEVEL FAMILY (Wurm (1972))

(DAG) Dagan Family (Dutton (1971b))

a. Daga

- 1. Northern
- ii. Southern

- b. Mapena
- c. Gwedena
- d. Ginuman
- e. Sona

- 1. Northern
- ii. Southern

- f. Jimajima
- g. Maiwa
- h. Onjob

17. BINANDEREAN STOCK (Hooley and McElhanon (1970))

(BIN) Binanderean Family (1971b)

- a. Suena
- b. Yekora
- c. Zia
- d. Binandere
- e. Ambasi
- f. Aeka
- g. Orokaiva

- 1. Sohe
- ii. Waseda
- iii. Popondetta
- iv. Dobuduru

- h. Hunjara
- i. Notu
- j. Yega
- k. Gaina
- l. Baruga
- m. Dogoro
- n. Korafe

(GUH) Guhu-Samane

18. YELE-SOLOMONS-WASI STOCK (Wurm (1972))

(ROS) Rossel Island Family

a. Yele

Gulf District Isolates (Franklin (1972))

(POR) Porome

(PAW) Pawaiian

(PUR) Purari

(TAT) Tate

(WAI) Waia

(WIR) Wiru

Unclassified (Dutton (1971b))

(DOG) Doga

(MAIS) Maisin

(I) Area I

a. Mekeo

b. Roro

c. Nara

d. Kuni

e. Kabadī

f. Doura

(II) Area II

a. Motu

b. Sinagoro

i. Ikolu

ii. Balawaia

iii. Saroa

iv. Kwabida?

v. Taboro

vi. Boku

vii. Ikega

viii. Wiga

ix. Buaga

x. Kubuli

xi. Tubulamo?

xii. Omene

xiii. Kwalbo

xiv. Alepa?

xv. Vora

xvi. Oruone

xvii. Babagarupu

- c. Keapara
 - i. Hula
 - ii. Babaga?
 - iii. Kalo
 - iv. Keapara
 - v. Aloma
 - vi. Maopa
 - vii. Wanigela
 - viii. Kapari?
 - ix. Lalaura
- d. Magori

(III) Area III

- a. Suau
 - i. Bonarua
 - ii. Dahuni
 - iii. Daiomoni
 - iv. Daul
 - v. Logea
 - vi. Mugula
 - vii. Sariba
 - viii. Suau
- b. Buhutu
- c. Tubetube

(IV) Area IV

- a. Nuakata
- b. Guregure
- c. Keldogelian?
- d. Noboda
- e. Sawabwara
- f. Urada

(V) Area V

- a. Bwaidoga
- b. Dobu
- c. Enataulu
- d. Galeya
- e. Gilagila?
- f. Kukuya
- g. Lakulakuia
- h. Mataita
- i. Molima
- j. Nade
- k. Swea Bay

(VI) Area VI

- a. Wagawaga
- b. Kehelala
 - i. Basilaki
 - ii. Kehelala
 - iii. East Cape
 - iv. Yalaba?
 - v. Maiwara
 - vi. Tabara

(VII) Area VII

- a. Wedau
 - i. Wedau
 - ii. Taupota
 - iii. Awalama
- b. Dawawa
- c. Boianaki

(VIII) Area VIII

- a. Igora
- b. Paiwa
- c. Mukawa
- d. Gabobora
- e. Ubir
- f. Arifama-Miniafia
 - i. Arifama
 - ii. Miniafia
 - iii. Oyan
 - iv. Lakwa

(IX) Area IX

- a. Gawa
- b. Gumasi
- c. Kiriwina
- d. Murua
- e. Nada

(X) Area X

- a. Alinganda
- b. Bobohaean
- c. Nimoa
- d. Panayati
- e. Panakrusima
- f. Sabari
- g. Tokuna

(XI) Area XI

- a. Sud-Eastern

(PM) Police Motu or Hiti Motu, the principal lingua franca of Papua.

APPENDIX D

PAN REFLEXES IN PAPUA¹

Cognate Set	Meaning	Languages	Source
1. <u>uma</u> <u>umo</u>	<i>garden</i>	II/a,bx;PM KIW/c	garden: set 9
Reflexes of:			
<u>*quma</u> <u>(h)uma</u>	<i>garden</i> <i>garden</i>	(OC)-Grace (IN)-Capell	
2. <u>bala</u> <u>wara</u> <u>varaba</u> } <u>waraba</u> } <u>porotuto</u> <u>varanue</u> <u>obara</u> <u>xambaro</u>	<i>fence</i>	II/c KIW/e11;KOI/b; MAI/b,c VIII/b KWA/c(extinct) BIN/h	fence: set 4
Reflexes of:			
<u>*mpaa</u> <u>pala</u>	<i>fence</i> <i>fence</i>	(EB)-Grace (IN)-Capell	

¹All of the relevant reconstructed forms for MN given by Chowning (1963) for foodstuffs in MN have reflexes in NAN as well as AN languages in Papua except: (a) *pudi *banana* which has reflexes in AN languages only, and (b) *vila *taro* which has no observed reflexes in any language in Papua in the material used in this study.

Cognate Set	Meaning	Languages	Source
3. taro alo	<i>taro</i>	HIG/a;PM;I/b; II/a;bi11 ETF/c	taro: set 23
Reflexes of:			
* <u>tales</u> * <u>talo</u> * <u>ntalo</u> (s) * <u>talət</u>	<i>taro</i>	PAN-Dyen, Capell MN-Chowning OC(EB)-Grace PAN-Dempwolff	
4. u. di hudzi ?udi wudi usi hudi udze	<i>banana</i>	III/c V/u V/b V/1 IX/c V/r KOI/e	banana: set 39
Reflexes of:			
*pudi *puti *pun[t+]i[q?h] *pun[t]i[']	<i>banana</i>	MN-Chowning OC(EB)-Grace PAN-Dyen PAN-Dempwolff	
5. tohu ?ou tou touyi jabu jou zou do?u dom/dou dzobu zovu dzou o-u dou tohu touvu tou towbu tovu tomu tom tu ^w o tebo	<i>sugarcane</i>	UBP/b, KAI, PM MAI/a, b, ci-x11, e DOG, MAIS MAIS BIN/g(1?) BIN/giv, h, j BIN/a BIN/d BIN/e BIN/g, k, n BIN/h, l BIN/1 MAI/c BIN/e II/a; V/p, u V/a V/b, f, IX/c, d V/1 VII/b VII/c; VIII/c VII/c, VIII/b X/c II/Magori	sugarcane: set 7

(Continued opposite)

Cognate Set	Meaning	Languages	Source
ovu		II/cv,vi,vii	
obu		II/cix	
tihu		V/r	
komu		II/bi,bii,biii,bv, bvi,bvii,bviii,bx, bxvi;II/ci,ciii	
?omu		II/civ	
rou		TUR/b	
you		TUR/c	
Reflexes of:			
*tovu	<i>sugarcane</i>	MN-Chowning	
*topu		OC-Grace	
*tebuSe		PAN-Dyen	
*təbu		PAN-Dempwolf	
6. kumwala	<i>sweet potato</i>	III/c;V/o	sweet potato: set 9
komwara		V/b	
kumuara		V/d,k;	
kumala		VI/ci	
kumara		KOI/bii	
kamara		KIW/eiii	
amareta		ETF/b	
ambara }		GOI/c	
biro			
thambara		BIN/g	
tambara		BIN/e,i	
kevara		MAN/a	
evara		KOI/dii	
gumala	<i>yam</i>	KWA/c	yam: set 25
kuvara		MAN/b	
[umana]		KWA/a	
gubara		MAN/b	
amara	<i>garden</i>	DAG/f;DOG	garden: set 27
Reflexes of:			
kumala }	<i>sweet potato</i>	Polynesian-Ray(1907:37)	
kumara }			
?umala }			
gumala }			
kumaa }			

Cognate Set	Meaning	Languages	Source	
9. ?uvi	<i>yam</i>	VII/c		
kubi		VIII/c		
kuv		IX/d		
ubi		DOG		
<u>hope</u> ?a } <u>hobe</u> a	<i>sweet potato</i>	ANG/l		
<u>gobe</u> ?u		KOI/c1		
<u>kobe</u> ?u		KOI/c1		
<u>gob</u> ou		KOI/c1(Eava)		
<u>gob</u> eu		KOI/c11		
<u>kub</u> ea		KOI/c111		
<u>gobe</u>		KOI/c1v, cv, cv1		
		KOI/b		
<u>kobe</u> ?a		KOI/b		
<u>gobe</u> ?u		KOI/d11		
kupe		GOI/d		
kup		GOI/e(Karukaru)		
kup		GOI/d		
kupa	GOI/d,e			
kuve, kubalava, } kubu	<i>taro</i>	GOI/d		
upi	<i>garden</i>	DAG/c		
tupi		DAG/d		
udze	<i>banana</i>	KOI/e		
kufe		GOI/d		
ufi		KOI/a1, a11		
uhi		KOI/a1, a11		
wi		KOI/a1		
wɥhi		KOI/a1		
uvu		KOI/c1		
uve		KOI/c11, c111, c1v, cv, cv1		
Reflexes of:				
*huvi		<i>yam</i>	MN-Chowning	
*qupi	<i>yam</i>	OC-Grace		
*qubi[?h] } *qumbi[?h]	<i>yam</i>	PAN-Dyen		
*'ubi	<i>yam</i>	PAN-Dempwolff		
hubi	<i>yam</i>	IN-Capell		

APPENDIX E

Cognate Sets Across Item Boundaries

This appendix groups together those cognate sets from different items which appear to be reflexes of the same proto-form. The first five contain reflexes of established or proposed PAN proto-forms, the remainder, reflexes of as yet unestablished proto-forms which are tentatively represented herein by starred capitalised forms, e.g., *BURU. The listing follows:

1. *KUMARA

Cognates	Meaning	Languages	Source
amara	<i>garden</i>	DAG/f;DAG	garden: set 27
kumwala	<i>sweet potato</i>	III/c;V/o	sweet potato: set 9
komwara		V/b	
kumuara		V/d,k	
kumala		VI/ci	
kumara		KOI/bii	
kamara		KIW/eiii	
amareta		ETF/b	
ambara }		GOI/c	
biro			
t ^h ambara		BIN/g	
tambara		BIN/e,i	
kevara		MAN/a	
evara		KOI/dii	
gumala		<i>yam</i>	
kuvara	MAN/b		
[umana]	KWA/a		
gubara	MAN/b		

(Continued overleaf)

Reflexes of:

kumala	}	<i>sweet potato</i>	Polynesian (Ray (1907:37))
kumara			
?umala			
gumala			
kumaa			

¹See Brand (1971:359-63) for a discussion of the origin of this word and refutation of the notion that it is related to the American Indian Quechua word *cumar*.

2. *KALE

Cognates	Meaning	Languages	Source		
kali	<i>sweet potato</i>	TEB/a	sweet potato: set 3		
gali		TEB/b			
ga		IPI			
ale		HIG/c(N.Mendi)			
sali		PAW			
kairɛ		DOG;VII/b			
kairɛ kut }		VIII/e			
kairɛkut					
kairɛ kuta		VIII/f1, f11, f111			
kaele }		DAG/d, e1, e11, f			
kairɛ }					
kairɛ kuta		MAIS(C)			
kairu kuta }		BIN/m			
kairɛ tuta }					
kiru kuta		BIN/n			
baire		DAG/a1(Gwedede), b, c			
baere		DAG/c			
bairɛn		DAG/c, g			
kare		<i>taro</i>		MAN/a	taro: set 25
kale				II/b1, b11, bvi, bviii, bxvi; c1, viii	
kae	BIN/g; II/bx				
?ale	II/civ				
galiyo	<i>yam</i>	ESF/a	yam: set 6		
gayo		ESF/b			
gali		ESF/c, d			
kara		BOS/a			
kaaliya		BOS/a			
[yare]		KOI/d11			
kae		BIN/g			
gae		BIN/i			

Reflexes of:

*kale	<i>taro</i>	MN-Chowning
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3. *MAO

Cognates	Meaning	Languages	Source
mao	<i>sweet potato</i>	PUR	sweet potato: Isolates
mao	<i>yam</i>	BOA/a111;II/bv	yam: set 3
maho		KIW/d111,e11, e11;UBP/a;IPI; KWA/a;PM; II/a II/b BIN/e KIW/g KWA/a;MAI/b KWA/b	
ma.o			
mau			
maʔou			
[maho]			
[mahoʔuro]			
Reflexes of:			
*mao	<i>taro</i>	MN-Chowning	
*ŋmao	<i>taro</i>	OMA-Grace	

4. *KUBI

upi	<i>garden</i>	DAG/c	garden: set 20		
tupi		DAG/d			
hopeʔa ¹	<i>sweet potato</i>	ANG/l	sweet potato: set 11		
hobeā		KOI/c1			
gobeʔu		KOI/c1			
kobeʔu		KOI/c1 (Eava)			
gobou		KOI/c11			
gobeu		KOI/c111			
kubeu		KOI/b,c1v,cv,cvi			
gobeu		KOI/b			
kobeʔa		KOI/d11			
gobeʔu		GOI/d			
kupe		GOI/e (Karukaru)			
kupe		GOI/d			
kupa		GOI/d,e			
ʔuvi ²		<i>yam</i>		VII/c	yam: set 7
kubi				VIII/c	
kuv		IX/d			
ubi		DOG			
kuve	<i>taro</i>	GOI/d	taro: Isolates		
kuvalava					
kubu					

¹For eʔa, eʔu see yam: set 41.

²Perhaps also related to kombi, komba etc. given in yam: set 18.

(Continued overleaf)

Cognates	Meaning	Languages	Source
ufi	<i>banana</i>	KOI/a1,a11	banana: set 7
uhi		KOI/a1,a11	
wi		KOI/a1	
wɸhi		KOI/a1	
uvu		KOI/c1	
uve		KOI/c11,c111,c1v, cv,cv1	
udze		KOI/e	
kufe		GOI/d	
Reflexes of:			
*huvi	<i>yam</i>	MN-Chowning	
*qupi	<i>yam</i>	OC-Grace	
*qubi[ʔh]}	<i>yam</i>	PAN-Dyen	
*qumbi[ʔh]}	<i>yam</i>	PAN-Dempwolff	
*'ubi	<i>yam</i>	PAN-Dempwolff	
hubi	<i>yam</i>	IN-Capell	
5. *KANI			
kani }	<i>taro</i>	VII/c	taro: set 7
ʔani }		DAG/c	
ʔani		DAG/e1	
ʔʌn		DAG/e11	
an		DAG/e11	
<u>aneg</u>		ETF/d	
<u>anega</u>		KIW/a111	
<u>sagani</u>		KIW/d11,d111	
<u>tagani</u>		KIW/f	
<u>ganisa</u>		ANG/g	
gani	<i>yam</i>	III/cv11	yam: set 19
ɣani		II/cv,cv1,c1x	
kanikani		V/q	
anemai		I/a	
aniani		V/f	
narem		III/a11	
<u>sagani</u>		KIW/d11	
aniani	<i>food</i>	II/a	
ɣani	<i>banana</i>	II/bv,c111	banana: set 31
ŋani		II/b	
ʔani }		I/f	
a:ni }		II/c1v	
ani			
Reflexes of:			
*ka,kai	<i>food</i>	EB-Grace	
*kani	<i>to eat,food</i>	OC(EB)-Grace	

6. *(T)ISIABURU

This large group is divided into (T)ISIA and BURU subgroups for ease of comparison. Some data is common to both.

6a. The (T)ISIA subgroup

Cognates	Meaning	Languages	Source	
<u>isiaburo</u>	<i>garden</i>	BIN/m	garden: set 1	
<u>siyofulu</u>	<i>sweet potato</i>	ESF/a	sweet potato: set 10	
<u>siyafuu</u>		ESF/b		
<u>siyobulu</u>		ESF/e		
<u>siyabul</u>		ESF/d		
<u>siapuru</u> }		BOS/a,b,c;WKU/a		
<u>siabulu</u>				
<u>siyabulu</u>		BOS/a		
<u>siapuri</u>		BAI		
<u>supuru</u>		WKU/a		
<u>tia</u>		HIG/a		
<u>dia</u>	TEB/c			
<u>diani</u>	TUR/Barika			
<u>sesiayuro</u>	<i>taro</i>	4. Iria ¹	Information supplied by Drs C.L. Voorhoeve and M. Anceaux	
<u>sersiabura</u>		5. Asienará		
<u>sie, sibu</u>		11. Iha		
<u>tiawu</u>		12. Barau		
<u>sia'i</u>		17. Puragi		
<u>si'japido</u>		20. Inanwatan		
<u>si'ap</u>		41. Borái		
<u>siew</u>		42. Hattam		
<u>isia</u>		BIN/k,l,m,n		taro: set 13
<u>yisiya</u>		BIN/n		
<u>gesi</u>		DOG		
<u>sisí</u>		II/Labu		
<u>diyas</u>		ESF/c		
<u>iya</u>	KOI/cii			

¹The locations of these languages are as follows:

- 4. Iria (NAN)
- 5. Asienará (NAN) } Western side of Kamarau Bay
- 10. Baham (NAN)
- 11. Iha (NAN) } Eastern side of MacCluer Gulf and around to Rijklof Van Goens Bay
- 12. Barau (NAN)
- 17. Puragi (NAN)
- 20. Inanwatan (NAN) } Western side of MacCluer Gulf
- 41. Borai (AN)
- 42. Hattam (AN) } North western side of Geelvink Bay

6b. The BURU Subgroup

Cognates	Meaning	Languages	Source
moro	<i>garden</i> ¹	KIW/b	garden: set 1
muro		MAN/a;b	
bua		BIN/a	
buro		BIN/e,1,j,k,l,m	
pure		BIN/f,g,h	
baburo		BIN/1	
isiaburo		BIN/m	
kopura		VII/c	
kupura			
upura			
kofura			
ne ufurana		DAG/d	
dzuwore		KOI/f1	
dzuwora		KOI/f111	
dzuwari		KOI/d	
dzuwai			
dzuru			
dzaure			
dzurəʔə		KOI/f111	
ware		BIN/n	
buru	KOI/b1,c1,c11, c111,cv		
bu:	GOI/e(Karukaru)		
vu:	KOI/civ		
mu:	KOI/e		
mue			
forova oti	ELE/b,c		
oru(uta)	ELE/c		
faura	TAT		
vo.ore	KWA/a		
porotuto varanue	<i>fence</i>	VIII/b	fence: set 4
furu	<i>fence</i>	VIII/f1;BIN/m	fence: set 16
fuř	VIII/f11,f111		
furo	BIN/m		
siyofulu	<i>sweet potato</i>	ESF/a	sweet potato: set 10
siyafuu		ESF/b	
siyobulu		ESF/e	
siyabul		ESF/d	
siapurū		BOS/a,b,c;KWU/a	
siabulu			
siyabulu			
siapuri			
supuru			
supuru			
sesiayuro	<i>sweet potato</i>	4. Iria	Information supplied by Drs C.L. Voorhoeve and M. Anceaux
sersiabura		5. Asienará	
sibu		11. Iha	
tiawu		12. Barau	
siaʔi		17. Puragi	
sijapido		20. Inanwatan	
siäp		41. Borái	
siew		42. Hattam	

¹Cf. garden: set 1, f.n.1.

Cognates	Meaning	Languages	Source
<u>bu</u> řk ^h u	<i>yam</i>	ETF/c	yam: set 4
<u>borometa</u>		ETF/c	
<u>bolu</u>		TEB/a	
[<u>bolu</u> ? ^h]		KOI/c	
[<u>boluk</u> ^]		KOI/cii	
[<u>boluka</u>]		KOI/ciii,civ	
<u>bapore</u>		ELE/a	
<u>mapore</u>		ELE/a,c	
<u>maperi</u>		TAT	
[<u>amboro</u>]		BIN/h	
[<u>kamboro</u>]		BIN/i,k	
[<u>hopoi</u>]		GOI/c	
[<u>bolai</u>]		DAG/a11,e1	
[<u>bola</u> ?i]		DAG/ei	
<u>olu</u>	<i>taro</i>	II/Bina	taro: set 38
<u>boro</u>		V/b	

7. *KERO¹

<u>e gelo</u>	<i>garden</i>	BOS/b	garden: set 2
<u>igenai</u>		BOS/c	
<u>gero</u>	<i>sweet potato</i>	BIN/a	sweet potato: set 2
<u>kirutua</u>		KOI/fi	
<u>irui</u>		KAI	
<u>keloto</u> }			
<u>kilotə</u> }		KOI/fiii	
<u>akira</u> }			
<u>agira</u> }		EKU/a	
<u>kera</u>	<i>taro</i>	KIW/a11	taro: set 21
<u>elomaəu</u>		KOI/d1	
<u>kero</u>		VIII/d1	
<u>keru</u>		VIII/c	
<u>elo siveli</u>	<i>yam</i>	KOI/d1	yam: set 13
<u>iro</u>		KOI/d1,d11	
<u>kiroma</u>		MAN/a	
<u>ilo</u>		YAR/d	
[<u>iro</u>]		KOI/d	
[<u>iroma</u>]		MAN/b(Uderi)	
<u>keru</u>		VIII/b	

¹This group may also include mokela, mosera etc. given in sweet potato: set 1.

8. *(M)BERE

Cognates	Meaning	Languages	Source
meni } peni } meroi } meru mer berar perih pari pa'ea	<i>garden</i>	PAW MOR/l MOR/h MOR/g TIR/a KIW/a111,c KIW/e11	<i>garden: set 10</i>
vero } verε'ε } veru } yeru be:ra veire vabele yabili fabe faε mafe mafi pape paape ili pe:r pari berar naport bore bolibo tigala benali peni ariloi } xarida gari gari wan keri(zi) keri	<i>fence</i>	KOI/d1;f1 KOI/d11 KOI/f11 KOI/f111 KWA/a KWA/b TEB/c KOI/d1 EKU/a WKU/c HIG/a HIG/b BOS/b TIR/a ETF/a MOR/g ANG/h KOI/e ESF/a PAW GOI/e DAG/c,e1;VII/c DAG/ei MAIS VIII/e	<i>fence: set 5</i>
me mber bed tebele pere firi meli mi mea	<i>taro</i>	WKU/a MOR/l MOR/h MAI/e TUR/c TUR/Dugeme POR TUR/Bariba TUR/Karima	<i>taro: set 1</i>
ere erawo yirau erau kerisi feri	<i>yam</i>	DUN;HIG/d KIW/a11 TIR/a TIR/b WKU/c TUR/a	<i>yam: set 1</i>

(Continued opposite)

Cognates	Meaning	Languages	Source
<u>efare</u>	<i>yam</i>	ELE/c	
<u>mbira</u>		HIG/b	
<u>mbere</u>		HIG/c	
<u>beli</u>		PAW	
[<u>ilawa</u>]		MAI/a	
<u>pedai</u>		GOI/d	
<u>obiri</u>		MAI/eii,eiii,exii	
<u>obili</u>		DAG/a11	
<u>wabi</u>		MAI/ci,cii	
<u>wabin</u>		MAI/a,b	
<u>bai?e</u>		DAG/g	
[<u>papi</u>]		MOR/d	
[<u>opeti</u>]		GOI/d	
[<u>wabi-i</u>]		MAI/c	
<u>wabiri</u>		II/Labu	
<u>obiri</u>		III/a11	
<u>vabuli</u>		II/bi,bii,biii,bvi, bvii,bxvi	
[<u>waburi</u>]		II/bv,bviii,bx	

9. *KAU

(h) <u>aukava</u>	<i>sweet potato</i>	KOI/a	sweet potato: set 6	
<u>aukapa</u> }		ELE/a		
<u>aukapo</u> }		ELE/Unspecified		
<u>aukeva</u>				
<u>kauari</u> }		ELE/c		
<u>aukara</u>				
<u>kaua mose</u>		KWA/a		
<u>ava mohe</u>		KWA/b		
<u>hawani</u>		TAT		
<u>ukava</u>		I/a		
<u>kau</u>		YAR/a11(Sth),c		yam: set 2
<u>ka?u</u>		MAN/b;MAI/d; YAR/a,b,c,		
<u>xa?u</u>		YAR/a		
<u>kau-u</u>	MAI/c			
<u>u-a</u>	MAI/c			
<u>uare</u>	BIN/c			
<u>uware</u>	BIN/1			
<u>uwawia</u>	BIN/d			
[<u>aula</u>]	YAR/a11(Sth)			
[<u>au-ula</u>]	MAI/c			
<u>au</u>	ANG/h			
<u>lauwikmik</u>	GOI/a			
<u>lawikyeikmek</u>	GOI/a			
[<u>lawikwizimek</u>]	GOI/a			
<u>iau</u>	DAG/g			
[<u>aumai</u>]	GOI/c			
[<u>tau?era</u>]	MAN/b			
[<u>?aura</u>]	YAR/a			
[<u>awura</u>]	YAR/b			

(Continued overleaf)

Cognates	Meaning	Languages	Source
<u>kopura</u> } <u>kupura</u> } <u>upura</u> } <u>kofura</u> } <u>ne ufurana</u> }	<i>garden</i>	VII/c DAG/d	garden: set 1
<u>xambaro</u> <u>obara</u>	<i>fence</i>	BIN/h KWA/c(extinct)	fence: set 4
<u>kur+ta</u>	<i>fence</i>	ANG/b	fence: set 6
<u>gogola</u>	<i>fence</i>	II/Bina	fence: set 3c
<u>kopare</u> } <u>kobaeri</u> }	<i>taro</i>	BOS/c	taro: set 39
<u>saparo</u> <u>saparu</u>		WKU/a WKU/c	
<u>sopapo</u>	<i>garden</i>	ETF/b	garden: set 3
<u>sagani</u> <u>tagani</u>	<i>taro</i>	KIW/d11,d111 KIW/f	taro: set 7
<u>akira</u> } <u>agira</u> }	<i>sweet potato</i>	EKU/a	sweet potato: set 2

The following are additional doubtful sets:

<u>kukop</u> <u>kogau</u> (root crop) <u>gogosu</u>	<i>garden</i>	MOR/c ESF/a UBP/a	garden: set 6
<u>uta</u> } <u>uda</u> } <u>kh^hthəf</u> <u>kota</u> <u>ʔoha</u> <u>fota</u>	<i>fence</i>	BOA/a,b PAH/a MAN/a MAN/b DAG/b	fence: set 1
<u>gonaʔa</u> <u>gonaaʔaa</u> <u>onaga</u> <u>h^hh^hnu</u> <u>qu</u> <u>uneʔ</u>	<i>fence</i>	DAG/e1 ANG/l DAG/f YAR/d TEB/b,c ANG/j	fence: set 2

10. *KUTA

<u>kaire kut</u> } <u>kairekut</u> } <u>kaire kuta</u> } <u>kaire kuta</u> } <u>kairu kuta</u> } <u>kaire tuta</u> } <u>kiru kuta</u> } <u>ku:tazi</u> }	<i>sweet potato</i>	VIII/e VIII/f1,11,111 MAIS(C) BIN/m BIN/m BIN/n MAIS(K)	sweet potato: set 3 sweet potato: Isolates
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(Continued opposite)

Cognates	Meaning	Languages	Source
kuta	<i>yam</i>	DAG/h;BIN/n; MAIS(C)	yam: set 10
koroma <u>kuta</u>		BIN/n	
?ua		MAI/c1,c11,e11, e111	
oru <u>uta</u> (garden)		ELE/c	
ut/uta?		VIII/e,f11	
uta		VIII/f1	
ua		III/a11	

Perhaps this group should also include the following:

uta }	<i>fence</i>	BOA/a,b	fence: set 1
uda		PAH/a	
k ^h o ^h h ^h ǎ̃		MAN/a	
kota		MAN/b	
?oha		DAG/b	
fota		OK(PMO)	fence: set 1b
*daam		GOG	
ta		TIR/b	
tʌk ^h			

11. *KARA

araya	<i>garden</i>	II/b1,b11, bxv11,c111	garden: set 21
yadaya		II/bv	
ara		II/c1	
araa		II/c1v	
gara	<i>fence</i>	KIW/e111;IPI; KOI/c;DOG;VIII/e	fence: set 3a
kar		ETF/d;MAB	
ɣala		KOI/a	
ɣara		II/b111,bv	
gaya }		MAI/a	
gaea }		ESF/a	
bolibo <u>tigala</u>		KIW/a,b,c;ETF/a,b;	
kara		KAI;POR;WAI	
ara }	<i>fence</i>	KIW/c,d,f,g;TUR/a;	fence: set 3b
ala		PM;II/a,bv111	
arana		I/e	
arak ^h e		MOR/a	
arak		MOR/b,c	
koro	<i>fence</i>	ELE/a	fence: set 3c
kora		ELE/c	
oro		YAR/a	
<u>gogola</u>		II/Bina	
<u>orabo</u>		MAI/e(111,v11,v111, ix)	
ani <u>hor</u> A		GOI/c	

(Continued overleaf)

Cognates	Meaning	Languages	Source
gana	<i>fence</i>	DAG/a11;II/Labu; d;III/a11;VII/b; X/d;MAI/e(except i11,v11,v111,1x) II/a,b1,b11,bv11, bxv11	fence: set 3d
kana		II/c1,c111,c1v,cv, cv1,cv11,c1x	
gana	<i>arm/leg band</i>	II/a	
gana	<i>garden</i>	III/a111	garden: Isolates

12. *(KI)BANI

<u>kibani</u>	<i>taro</i>	DAG/a11;II/d; III/a11	taro: set 6
<u>ipan/ipam</u> <u>ban</u> <u>panine/bani</u> <u>bani</u>		HIG/c MAI/b,c1,c11, MAN/b MAN/b;YAR/a;MAI/c	
<u>bani</u> [bani] [banai/banae]	<i>yam</i>	MAN/b MAN/b;DAG/b DAG/a1,g	yam: set 8

13. *HINA

<u>sina</u> <u>asī</u> <u>sanaru</u> [sanaru] [sin kau] [sini] <u>kini</u>	<i>yam</i>	KOI/a GOI/e(Karukaru) KOI/d1 KOI/d11 YAR/c YAR/c ROS	yam: set 11
<u>hina</u> <u>hiña</u> <u>sɛ: no</u>	<i>sweet potato</i>	HIG/d DUN KOI/c11(Borid1); c111 KOI/b1,b11 KWA/b KOI/a(East) KOI/a(East)	sweet potato: set 7
<u>ina</u> <u>inaso</u> <u>iniveyu</u> <u>inueli</u> <u>iniveu</u> } <u>inieuda</u> }		I/e	

14. *ADARI

Cognates	Meaning	Languages	Source
adasl } avasl }	<i>garden</i>	GOI/c	garden: Isolates
adarA } atari } a dari } adang }	<i>sweet potato</i>	GOI/c	sweet potato: Isolates
atari dariq	<i>taro</i>	GOI/c TEB/b	taro: set 16

15. *WAIA

waia	<i>garden</i>	YAR/a,b	garden: Isolate
faiya	<i>sweet potato</i>	WKU/c;TUR/Ikobi	sweet potato: set 14
waisa [waia] [waiagu] [waiaka]	<i>yam</i>	GOG;BAI KOI/a,b1,b11 KOI/c1(Eava) KOI/f11	yam: set 16

16. *KOKIA

gogie } koki }	<i>sweet potato</i>	KOI/e	sweet potato: Isolates
kokia kokia } kokea }	<i>taro</i>	BOA/a11,b1,b11 BOA/a111	taro: set 27

17. *HAGO

ta saso nago hago dafu	<i>taro</i>	DUN KIW/a,a11,b KIW/a,c;TUR(Pepehe) KIW/c TUR/d	taro: set 8
sagu hago sago wagoro	<i>yam</i>	MAB KOI/b1 KOI/b1,b11 DAG/f	yam: set 12
hazo haho?a aha?a agovoto hakoA hakoA	<i>banana</i>	KWA/a,b MAN/b MAN/b MAN/b(Uderi) III/aviii VI/bv1	banana: set 8

18. *BA

Cognates	Meaning	Languages	Source
<u>baburo</u>	<i>garden</i>	BIN/i	garden: set 1
<u>vabele</u>	<i>fence</i>	KWA/a	fence: set 5a
<u>yabili</u>		KWA/b	
<u>fabe</u>		TEB/c	
<u>fae</u>		KOI/di	
<u>mafe</u>		EKU/a	
<u>mafi</u>		WKU/c	
<u>pape</u>		HIG/a	
<u>paape</u>		HIG/b	
<u>mai</u>	<i>taro</i>	HIG/a	taro: set 2
<u>maa</u>		HIG/b	
<u>ma</u>		HIG/d	
<u>mafi</u>		MAN/a	
<u>ma</u>		BIN/c,d	
<u>ba</u>		BIN/d,e,f,g,g,i,j	
<u>wadu/vadu</u>		KOI/a,bi,bii	
<u>madu</u>		KOI/di,dii	
<u>elomadu</u>		KOI/di	
<u>maku</u>		KOI/e	
<u>ha'u</u>		MAI/a	
<u>ma</u>		BIN/a	
<u>baxa</u>		BIN/i	

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