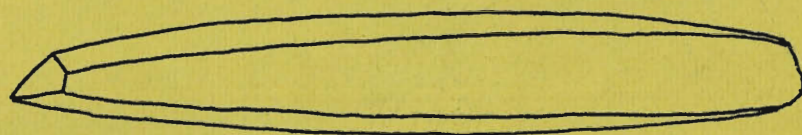


AXE MAKERS
OF THE
WANGI



John Burton

1984

AXE MAKERS OF THE WAHGI

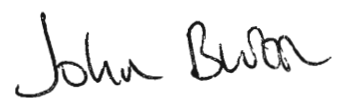
Pre-colonial industrialists of the Papua New Guinea highlands

John Burton

A thesis submitted for the degree
of Doctor of Philosophy of the
Australian National University

November 1984

Except where the contributions of others
are acknowledged, this thesis is the
result of my own original research.

A handwritten signature in cursive script that reads "John Burton". The letters are fluidly connected, with a prominent loop on the 'J' and a stylized 'B'.

John Burton

for Catriona

ABSTRACT

Before the first Australian patrol to Mt Hagen in 1933, stone axes were in daily use in the Papua New Guinea highlands and were widely traded, often in the context of ceremonial exchange. Many occurrences of hard rocks suitable for axe making were exploited, but only at a few centres was the manufacture of axes carried out on a large scale. In recent times, a group of axe factories located in the Wahgi and Jimi Valleys accounted for the bulk of production.

In this thesis I look at how the communities of axe makers organised quarrying expeditions, how they extracted the stone and made it into axes, and at the kinds of economic relations which existed between themselves and their neighbours. I focus on the Tuman quarries, in the central Wahgi Valley, Western Highlands Province, and the organisation of Tuman society with special reference to quarrying and axe making. I introduce the quarries of the Jimi Valley, also in Western Highlands Province, and the Dom language area, in Simbu Province, for comparative purposes. I also report on the use of geochemical methods and visual inspection to identify axes in ethnographic and archaeological collections from the highlands.

My findings are twofold. Firstly, that the type of production at each quarry was shaped by the balance of three factors: the geological disposition and mechanical properties of the axe stone, the ideology of the axe makers, and the ceremonial competitiveness of the economy in which they exchanged the axes. I argue that the scarcity or abundance of rocks suitable for quarrying was less important than the ability of a given community to respond to socio-economic forces, develop an effective system of quarrying and sustain production at a high level. The second finding is that axe stone from the modern quarries can be identified in rockshelters in levels dated to 2500-1500 years before the present. Bearing in mind the close relationships that I describe between social organisation, the wealth economy and quarrying methods, I conclude that this is one of the markers of the emergence in the highlands of a society of essentially modern aspect.

CONTENTS

ABSTRACT	iv
ACKNOWLEDGEMENTS	xii
ORTHOGRAPHY	xv
CONVENTIONS	xvii

Chapter

1	INTRODUCTION	1
2	METHODOLOGY AND ETHNOGRAPHIC CONTEXT	12
3	THE TUMAN QUARRIES	39
4	THE ORGANISATION OF WORK AT THE TUMAN QUARRIES	63
5	TUMAN KNAPPING PATTERNS	89
6	AXE BLADES AND HAFT MAKING	112
7	AXES AND BRIDEPRICES: WIFE-TAKING PATTERNS OF THE TUNGEI	137
8	QUARRIES OF THE SEPIK-WAHGI DIVIDE AND JIMI VALLEY	162
9	THE DOM GAIMA QUARRY	187
10	THE HIGHLANDS-WIDE DISTRIBUTION OF QUARRY PRODUCTS	205
11	AXE QUARRIES AND THE PREHISTORY OF THE HIGHLANDS	231

Appendix

A	Myths and Legends of the Axe Makers	251
B	A Twentieth Century Tungei Chronology	262
C	Songs of the Tuman Quarrymen	271
D	Petrographic Description of Grindstone Fabrics (A. Watchman)	279
E	Tungei Brideprice Transactions	281
F	Pukl Stone Axe Quarry (P. Gorecki)	285
G	Infrared Sources of Axes from Kuk and Wurup	289
H	Infrared Spectra of Quarries in the Study Area	297

BIBLIOGRAPHY	307
--------------	-----

TABLES

- 1.1 Stone axe sources in the Papua New Guinea highlands
- 2.1 Tungei Mongka: census of men and adolescent boys in 1933
- 3.1 Vernacular stratigraphy
- 5.1 Workshop analysis
- 5.2 '6C' classification
- 5.3 '6I' classification
- 5.4 Tuman flake analysis
- 6.1 Sharpening experiment
- 6.2 Hafting experiment
- 7.1 Sample of Tungei brideprices
- 7.2 Origin groups of wives received by the Tungei
- 7.3 Numbers of women from inside and outside Tungei
- 7.4 Recorded marriages between Tungei lineages
- 10.1 X-ray fluorescence
- 10.2 Wurup: breakdown of sources
- 10.3 Kuk: breakdown of sources
- 10.4 Kuk: breakdown of axe sources by environment of findspot
- 10.5 Axes from the Brennan collection
- 10.6 Recent prehistoric axe finds from Kuk
- 10.7 Archaeological finds of axes in the highlands
- 10.8 Manim Valley rockshelters: ground stone axe fragments

FIGURES

- 1.1 Papua New Guinea highlands: known and suspected stone axe sources
- 1.2 Archaeological sites of the Papua New Guinea highlands
- 2.1 Taylor-Leahy patrol 1933
- 2.2 Territory of the Tungei Mongka
- 2.3 Wahgi Valley: approximate group locations near Tungei
- 2.4 Unnamed Tuman River phratry: groups sharing origin myth
- 2.5 Tungei Mongka: modern pattern of segmentation
- 2.6 Tungei Mongka: population pyramid in 1958
- 2.7 Tungei Mongka: population pyramid in 1968
- 2.8 Tuman quarry expeditions
- 2.9 Kenjpi-emb: Menjpi Kanem

- 2.10 Kenjpi-emb: Andpang Kanem
- 2.11 Kenjpi-emb: Kełak Kanem
- 2.12 Kenjpi-emb: Onembe Kanem
- 2.13 Kenjpi-emb: Wałpi Kanem
- 2.14 Akamb: Mengemb
- 2.15 Akamb: Jipenemb
- 2.16 Komnemb: Epni Kanem, Arim Kumna Kanem
- 2.17 Komnemb: Epni Kanem, Arim Eki Kanem
- 2.18 Komnemb: Kenapuł Kanem, Arim Kumna Kanem (Eingał Kanem)
- 2.19 Komnemb: Kenapuł Kanem, Arim Kumna Kanem
- 2.20 Komnemb: Kenapuł Kanem, Arim Eki Kanem
- 2.21 Ekiemb: Osi Kanem
- 2.22 Ekiemb: Olt Kanem (Eingał Kanem)
- 2.23 Ekiemb: Olt Kanem (Epni Kanem)
- 2.24 Ekiemb: Olt Kanem (Epni Kanem)
- 2.25 Ekiemb: Olt Kanem
- 2.26 Menjpi: Kundika, Preka
- 2.27 Menjpi: Pingka, Mukei-emb
- 2.28 Menjpi: Kundika (Dua-Seka Kupam)
- 2.29 Menjpi: Kundika, Olt Kanem
- 2.30 Menjpi: Pingka, Komn-Tungei-emb
- 2.31 Menjpi: Pingka, Komn-Kundi-emb
- 2.32 Eska
- 2.33 Kupaka: Numndi-emb (includes Akamb)
- 2.34 Kupaka: Onembe-emb
- 2.35 Kupaka: Kelemb
- 2.36 Kupaka: Pingka
- 3.1 Tun valley: topography and geological interpretation
- 3.2 Tuman quarries: three major sites
- 3.3 Kunjin site plan
- 3.4 Kunjin Nos 1 and 2: profiles and direction of true dip
- 3.5 Kunjin Nos 1 and 2: Profiles from north to south
- 3.6 Ngumbamung site plan
- 3.7 Yesim site plan
- 3.8 Gapinj Aka Nui: plan of workings
- 3.9 Gapinj Aka Nui: details of excavation
- 4.1 Quarryman's basket

- 4.2 Seasonality in the Wahgi Valley
- 5.1 Tuman axe making: two kinds of raw material
- 5.2 Tuman axe making: alternative reduction methods
- 5.3 Tuman axe making: giant roughout made by Teie
- 5.4 Tuman debitage analysis: location of the workshop sites
- 5.5 Tuman debitage analysis: breakdown of the assemblages
- 5.6 Tuman axe making: workshop materials
- 5.7 Flake analysis: operation of automated recording system WKSHOP
- 5.8 Flake analysis: numerical taxonomy of the Keimbei assemblage
- 5.9 Flake analysis: discriminant functions of model 6I
- 5.10 Flake analysis: discriminant functions of model 6C
- 5.11 Flake classes: a selection of flakes from the Keimbei floor
- 5.12 Distribution of flake class 1 along transect
- 5.13 Distribution of flake class 2 along transect
- 5.14 Distribution of flake class 4 along transect
- 5.15 Distribution of flake class 6 along transect
- 5.16 Distribution of flake classes 6I-3 and 6I-5 along transect
- 5.17 Distribution of flake classes 6C-5 and 5C-4 along transect
- 5.18 Non-flake debitage: number of pieces
- 5.19 Non-flake debitage: weight of pieces
- 6.1 Two foremost axe styles
- 6.2 Axe from Gembogl, Simbu
- 6.3 Tuman axe hafted by Duri
- 6.4 Tuman axe making: Aip's roughout and finished axe blade
- 6.5 Tuman axes from modern collections
- 6.6 Axe making experiment
- 6.7 Tuman axe making: woodworking adze made by Duri
- 6.8 Tuman axe making: preparation of crosspiece and socket
- 6.9 Tuman axe making: Duri's crosspiece
- 6.10 Tuman axe making: preparation of handle
- 6.11 Tuman axe making: binding
- 6.12 Tuman axe making: steps in weaving
- 7.1 Tungei marriage patterns
- 7.2 Tungei marriage payments
- 7.3 Tungei wife-taking over six periods
- 7.4 Tungei tribe: known links between minimal lineages
- 7.5 Tungei tribe: importance of various sources of wives

- 8.1 Jimi Valley quarries
- 9.1 Dom language area
- 9.2 Dom gaima quarry: locality map
- 9.3 Dom Goroku: modern pattern of segmentation
- 9.4 Dom gaima site: reconstruction of mineshaft
- 10.1 Wurup: archaeological sites and placenames
- 10.2 Kuk: archaeological sites and placenames
- 10.3 XRF results: plotted discriminant function scores
- 10.4 Wurup: breakdown of sources
- 10.5 Kuk: breakdown of sources
- 10.6 Wurup collection: axes identified as Dabiri
- 10.7 Enga, Western Highlands and Simbu Provinces: axe collections
- 10.8 Western Highlands Province: distribution of Tuman axes
- 10.9 Enga Province: distribution of Tuman axes
- 10.10 Simbu Province: distribution of Tuman axes
- 10.11 Western Highlands Province: distribution of Jimi Valley axes
- 10.12 Western Highlands Province: distribution of Mbukl/Muklpin axes
- 10.13 Recent prehistoric axe finds from Kuk
- 10.14 Manim rockshelter: ground stone axes
- 10.15 Manim Valley rockshelters: Etpiti and Kamapuk, quarried stone

PLATES

- Frontispiece Axe making at the Tuman quarries
- 2.1 Panorama of the Tun and Wahgi valleys
 - 2.2 View across the Wahgi Valley in 1933
 - 2.3 Wahgi bridge below Kerowil
 - 2.4 Crossing on the River Kanye at Kudjip
 - 2.5 Palke territory in the Middle Jimi Valley
 - 2.6 Wahgi Valley
 - 2.7 Kubor Range
 - 2.8 Kiltei Ku
 - 2.9 Tuman River
 - 2.10 Men of the Komnemb sub-clan Epni Kanem, Arim Eki Kanem
 - 2.11 Hagener with ceremonial 'wig'
 - 2.12 Hagener with Nassa shell headband
 - 2.13 Hagener with pearlshell and spear

- 2.14 Komblo Bamni with a pair of Nassa headbands
- 2.15 Enga salt trader
- 2.16 Michael Mangi with sine pelt
- 3.1 Tun valley from the air
- 3.2 Forest disturbance at Ngumbamung and Kunjin
- 3.3 Forest disturbance at Yesim
- 3.4 Kunjin Pit 1 cleared of vegetation
- 3.5 Yesim Pit 1
- 3.6 Malimbe and Ap at Yesim
- 3.7 Access 'road' at Kunjin Pit 1
- 3.8 Kenjpi-emb Geḷu and Pok demonstrating quarrying methods
- 3.9 Kunjin Pit 7: quarry pit
- 3.10 Kunjin Pit 7: rock-cut gallery at base of pit
- 3.11 Gapinj Aka Nui: Pit 1 before excavation
- 3.12 Gapinj Aka Nui: section through Pit 1
- 3.13 Gapinj Aka Nui: Pit 1 in course of excavation
- 4.1 Malimbe indicating the position of the teper at Kunjin
- 4.2 Malimbe making a quarryman's spoil-removing basket
- 4.3 Interview at Kupang
- 4.4 Menjpi Toḷ with a selection of axe making materials
- 6.1 Malimbe illustrating the handedness of axe blades
- 6.2 Use of the National Museum collection in interviews
- 6.3 Close-up of a Hagener demonstrating the use of a grindstone
- 6.4 Hagener demonstrating the use of a grindstone
- 6.5 Man demonstrating the sharpening of a Tuman axe blade
- 6.6 Man with refitted haft and axe blade
- 6.7 Man with stone axe of unknown design
- 6.8 Hagener with Tuman axe
- 6.9 Hagener with Jimi Valley axe
- 6.10 Duri using a pair of **jipilj** to split the kapḷe
- 6.11 Cutting the socket with a stone adze
- 6.12 Making the woven band
- 6.13 Using the adze blade to shape the loose socket piece
- 6.14 Fitting the axe blade against the kapḷe me
- 6.15 Smoothing down the kapḷe with a glass scraper
- 6.16 Tying the kapḷe to the else
- 6.17 Binding the haft with **kan minimb**

- 6.18 Weaving the tui mum
- 6.19 Duri's axe completed
- 6.20 My axe completed
- 8.1 Grinding hollow at the Ganz River
- 8.2-8.4 Jimi Valley people in the early 1930s
- 8.5 The use of a hammerstone to prepare a roughout
- 8.6 A man uses a thin filing stone to sharpen an axe blade
- 8.7 Fixing the two parts of the haft together
- 8.8 The Tsenga tingri site
- 8.9 Ningni of Tsenga, holding a large gaima roughout
- 8.10 Yimpgrama village
- 8.11 Communal swidden garden at Yimpgrama
- 8.12 Quarry pit at Repeng
- 9.1 The mining area at Tonmai
- 9.2 Demonstration of spell to prevent rain from falling
- 9.3 A shaft at Tonmai, 1939
- 9.4 The same shaft from a different angle
- 9.5 Demonstration of how timbers were fitted against each other
- 9.6 Demonstration of methods of shoring mineshafts
- 9.7 Gore of Kwiwaku
- 9.8 Kora Kama of Kwiwaku
- 9.9 'A row of ceremonial axes...'

ACKNOWLEDGEMENTS

This thesis is the outcome of two periods of research in Papua New Guinea, from July 1980 to November 1980, and from May 1981 to November 1981, as a research scholar with the Department of Prehistory, Research School of Pacific Studies, Australian National University.

A large number of people helped me during fieldwork and while I was writing this thesis. Above all I wish to thank Jack Golson for my introduction to research in Papua New Guinea, and I thank both Jack and Jim Allen for their supervision of my project.

I gratefully acknowledge the Research School of Pacific Studies for its financial support; the Department of Anthropology and Sociology, University of Papua New Guinea, for hosting me while in PNG; the National Museum and Art Gallery of Papua New Guinea for granting an excavation permit and post-fieldwork facilities; and the governments of Western Highlands, Simbu and Enga Provinces for permitting me to carry out research in the areas of their jurisdiction.

In AUSTRALIA, many individuals contributed knowledge, practical assistance or hospitality - or all three - and I thank them warmly. At the ANU I was greatly helped by pre- and post-fieldwork discussions with John Chappell, Robin Hide, Ian Hughes, Jack Golson, Mary-Jane Mountain and Marie Reay. At the University of Sydney, Pawel Gorecki provided me with essential information at the start of my project.

In the Department of Prehistory I would like to give special thanks to Wal Ambrose, Chris Gosden, Jeannette Hope, Kieran Hotchin, Phil Hughes, Alan Lance, Dragi Markovic, Richard Mulvaney, Winifred Mumford, Jeanine Mummery, Betsy-Jane Osborne, Jim Rhoads, and Maureen Swanage. I am particularly grateful for the stone axe materials, quarry samples and archaeological results that Jack Golson, Pawel Gorecki, Ian Hughes, Mary-Jane Mountain and Jim Rhoads made available to me and for Alan Watchman's advice on geochemical sourcing methods.

In the production of the thesis, I would like to give special thanks to Alan for Appendix D, Pawel for Appendix F, Dragi for the plates, Jeanine for computer assistance, and Winifred for

Figures 1.2, 2.1, 3.8, 3.9, 9.1 and 9.2. Figure 1.2 was originally drawn by Winifred for Mary-Jane Mountain, Figure 10.1 is based on a map prepared by O.A. Christensen and Figure 10.2 is based on a map prepared by Pawel Gorecki. I am greatly indebted to Jack and Maureen for their marathon spells of proof-reading and sub-editing, but, I hasten to add, the errors that remain are my responsibility alone.

I am grateful to Bruce Chappell and Ross Freeman, in the Department of Geology, ANU, and Keith Massey, at the Research School of Earth Sciences, ANU, for the use of their facilities; I would also like to thank Lyn Noakes, formerly of the Bureau of Mineral Resources, for recalling his visit to the Dom quarry for me.

I made use of geological samples collected at the Mbukl quarry by Ronald Lampert in 1975; I thank him for his foresight. I also acknowledge The Australian Museum, Sydney, for the loan of the Kafiavana axe-adze finds.

I spent nearly a year in PAPUA NEW GUINEA, during which time I stayed for two months in 1980 and for six months in 1981 at Temek, a Tungei hamlet near the Tuman River. Many names spring to mind, but Ap, Dorum, Duri, Gelu, Ken, Kongua, Kunjin, Malimbe, Mila, Oura, Sike, Wandaki, and Wule were especially kind to me. I would also like to thank Councillor Munung for his approval of my project.

At Kuk Agricultural Research Station, I received very hospitable treatment from Brian and Lisa Thistleton and was very glad to have the company of Tim and Patrizia Bayliss-Smith. Kura, Maga, Mek, and Rea of the Kawelka settlement at Kuk were good enough to accompany me into the Jimi Valley in 1980. I would also like to thank Joseph Walua for his continuing interest in artefact collection.

At the Kar River, Michael O'Hanlon and Linda O'Hanlon provided me with just the right sort of advice when my project seemed to be faltering and I am grateful for a long interview with their informant, Komblo Bamni.

In Mt Hagen, I would like to thank Ruth Blowers, Bruce Blowers, Lee Eby, Ken Logan, Dan Leahy - who was kind enough to discuss the 1933 Mt Hagen patrol with me - John Pun, Neil Ryan, Roey Berger, Gabriel Waipok, and Wamp Nga Motors. At Minj, I am grateful to the District Officer, Jo Mangi, Michael Mangi and John Muke. I was very glad to have Jo and John in the field and I hope they had as good a

time as I did. In Wabag, I would like to thank Watu Lopo and Akii Tumu of the Enga Cultural Centre, for permitting me to examine the Brennan axe collection.

I am indebted to Robin Hide, Paul Wohlt and Ruth Wohlt for their hospitality during my visits to Kundiawa, and to Bruce Carrad, for helping me find accommodation in Wabag; I also thank Jean Clark who, on holiday, came with me to both places. The Nazarene Mission kindly provided me with accommodation at Tsingoropa, as did Chris Davenport, at Koinambe, and Wojtek Dabrowski, Kathy Dabrowski, Sister Erna, Sister Lorraine and Brother Paul, at Rulna.

In the Dom, I would like to thank Henry Goi for both his hospitality and his keen interest in my project; I regret not being able to do justice to the story of the Dom quarry. I also thank Colin Lamb, of New Tribes Mission, for answering my Dom language queries.

At the University of Papua New Guinea, I was well looked after by Donald Denoon, Pamela Denoon, Les Groube and Rosemary Groube, and at the National Museum and Art Gallery of Papua New Guinea, by Geoffrey Musowadoga and Pamela Swadling. I would also like to thank Resana Geno of the National Archives and Public Records Services of Papua New Guinea, and the ANU Field Managers, Hoseah John and Tau Manega.

Andrew Strathern, of the Institute of Papua New Guinea Studies, was kind enough to respond to my written inquiries with a great deal of useful information about Mbukl quarry, and I am extremely grateful to David Attenborough and Roy Rappaport, for the letters and photographs they sent me, and to Jeanette Leahy for allowing me access to the Michael Leahy collection of photographs in the National Library of Australia, Canberra.

NOTES ON ORTHOGRAPHY

I did not achieve any measure of competence in the Tuman language Ek Nii until the closing weeks of fieldwork in 1981; my interviews were therefore held almost entirely in New Guinea Pidgin, relying on younger people to interpret for men and women over the age of about 60 years. However, Bruce Blowers, Ruth Blowers and Lee Eby, Nazarene missionaries who lived at Temek in the 1960s, kindly gave me access to their Ek Nii language materials. Mrs Blowers also permitted me to record her card file on 35 mm film, from which I was able to produce a sizable Ek Nii dictionary in time for the 1981 period of fieldwork.

The orthography of Ek Nii used in this thesis is that given by Bruce Blowers (1975) for the neighbouring language, Middle Wahgi (Ramsey 1975), and adopted by Ruth Blowers for Ek Nii. Note that in this thesis vernacular words - but not names - are represented in **boldface**. The following is a simplification of the Blowers-Ramsey scheme:

<u>Vowel sound</u>	<u>English example</u>	<u>Nii examples</u>
Short a	"cat"	nam, amb
Long a	" <u>Ma</u> "	ka, mane
Short e	"bet"	ep
Long ei	" <u>ei</u> ght"	kei, pei
Closed, short i	" <u>bi</u> t"	sik, ninem
Closed, long i	" <u>fe</u> et"	Wiimbe
Open, long i	" <u>fe</u> et"	eki, kundi, ngi
Short o	" <u>po</u> t"	mon, ond, to!
Long ou	" <u>ow</u> e"	toue, Pou
Short u	" <u>pu</u> t"	dup, mum, wu
Long u	" <u>bo</u> ot"	ku, Tun

In some words, the sound represented by /ei/ varies, possibly due to the influence of Middle Wahgi. Thus the tribe name 'Tungei' may be said 'Tungei' or 'Tungai', or halfway between the two.

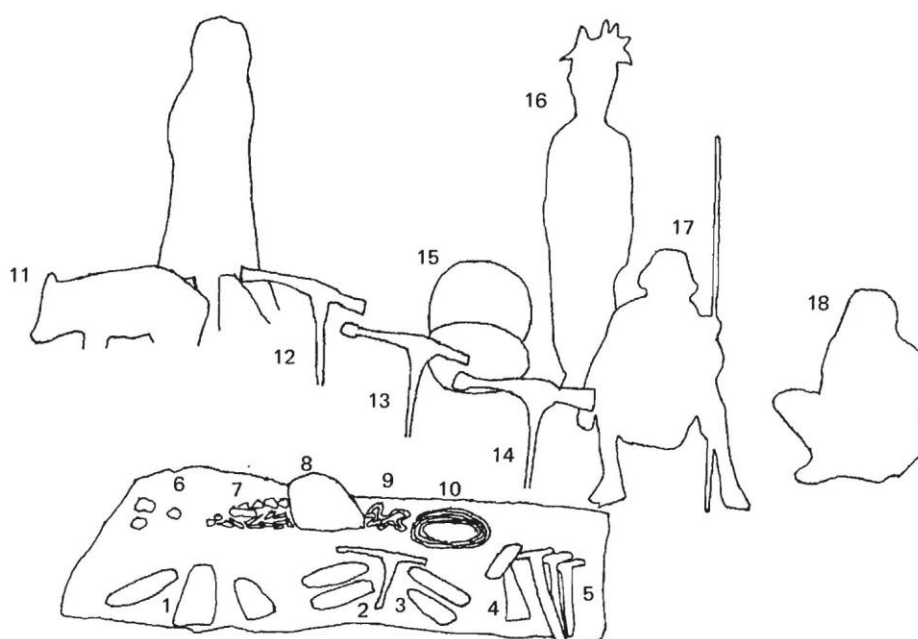
<u>Consonant</u>	<u>English example</u>	<u>Nii examples</u>
t/r (allophones)	" <u>t</u> ub", " <u>r</u> ub"	tu i, Tuman
Initial/medial j/nj Final nj	" <u>j</u> ump", " <u>e</u> njoy" "cent <u>s</u> "	ji k <i>i</i> , Kunjin en j, pi n <i>j</i>
lt	"we <u>ll</u> <u>done</u> "	go l <i>tem</i> , Kiltei
Medial ɬ Final ɬ	"ju <u>gg</u> ler" "ta <u>ck</u> le"	ku ɬ <i>em</i> , ka <i>p</i> ɬ <i>e</i> no ɬ, aɬ

Note that /t/ can be sounded either as 'r' or 't'. This is hard for an English-based orthography to cope with, as it has led in the past to the confusion of 'Rungei' and 'Tungei' in official documents and, worse still, 'Dongai'. Other Nii consonants approximate to English ones.

In the Dom area of Simbu Province and the Jimi Valley, I noted down technical terms as best I could; Colin Lamb, of New Tribes Mission, supplied some written answers to my queries about Dom terms, but local terms outside the Nii language area are generally included for the sake of documentation, and at the risk of inaccuracy.

CONVENTIONS

1. I made tape recordings at many of the formal interviews I held with Tungei and Goroku informants. One set of cassettes is archived with the Department of Prehistory, Research School of Pacific Studies, Australian National University, and another with the National Museum and Art Gallery of Papua New Guinea. In the interests of documentation, textual footnotes indicate which interviews have a bearing on the current discussion. My records of each interview (also archived with the above institutions) indicate which tapes relate to which interviews. These may be of interest to future students from the Tuman and Dom areas.
2. Map references of the form XY 001001 are Universal Grid References taken from the Papua New Guinea 1:100,000 series topographic survey maps.
3. I use the term 'highlands' as a geographical term, while reserving 'Highlands' for use in the names of administrative provinces.
4. I mention informants and some of their ancestors by name. These are their real names; only in one case did an informant ask me not to reveal the names of his forebears. In the case of the Tungei quarrymen, whom I knew better than any others, I have reasoned that their names should not slip into obscurity; on the contrary, they should be remembered.
5. Note that, as in the point above, much of my discussion assumes that axe makers and quarry workers were men. This was always the case. As a consequence, I received most information from old men. However, the term 'informants' is often used loosely; it can be assumed that this does not exclude informants who were also women.
6. The abbreviation PR in bibliographic citations means 'patrol report'.



Key: 1. Axe roughouts 2. Axe blades 3. Woodworking adze (*tui ongka*) 4. Wooden crosspiece (*kaple*) 5. Wooden handle (*else*) 6. Hammerstones 7. Pile of flakes (*tui win*) 8. Grindstone (*ku tukum*) 9. Vine for binding handle (*kan minimb*) 10. Weaving cane (*kan wieng*) 11. Pig, raised by Muk, a symbol of the goods exchanged for stone axes 12. Finished axe (Nat. Mus. E8386) 13. Duri's axe 14. My axe 15. Quarryman's baskets (*grenj kon*) 16. Girl, Margaret Ap, a symbol of the brideprices paid in axes 17. Quarryman — Malimbe 18. Haft maker — Duri.

AXE MAKING AT THE TUMAN QUARRIES

Frontispiece