THE DEATH OF A GREAT LAND

Ritual, History and Subsistence Revolution
in the Southern Highlands of Papua New Guinea

VOLUME II

Figures, Tables, Appendices,
Narratives and Plates

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Settled areas of the Papua New Guinea Highlands
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Figure A3  Language groups of the Papua New Guinea Highlands mentioned in the text
Figure A4  Archaeological sites mentioned in the text
<table>
<thead>
<tr>
<th>ESTIMATED AGE</th>
<th>NATURE OF DEPOSIT</th>
</tr>
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<tbody>
<tr>
<td>1969 AD</td>
<td>Tea plantation</td>
</tr>
<tr>
<td>?1920 AD / 100? BP (ANU-1035)</td>
<td>Tibito ash</td>
</tr>
<tr>
<td>&gt;240 ± 60 BP (ANU-1053)</td>
<td>Olgaboli ash</td>
</tr>
<tr>
<td>&lt;290 ± 60 BP (ANU-1054)</td>
<td>Soil aggregates</td>
</tr>
<tr>
<td>370 ± 70 BP (K-2643)</td>
<td>&quot;Y&quot; ash</td>
</tr>
<tr>
<td>1190 ± 50 BP (ANU-1206)</td>
<td>Ash infill</td>
</tr>
<tr>
<td>2000 BP</td>
<td>Grey clay</td>
</tr>
<tr>
<td>2500 BP</td>
<td>Early human activity</td>
</tr>
<tr>
<td>4000? BP</td>
<td>in the Kuk catchment</td>
</tr>
<tr>
<td>5500 BP</td>
<td></td>
</tr>
<tr>
<td>5,970 ± 80 BP (ANU-1057)</td>
<td></td>
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<tr>
<td>9000 BP</td>
<td></td>
</tr>
<tr>
<td>?</td>
<td></td>
</tr>
<tr>
<td>20,000 BP</td>
<td></td>
</tr>
</tbody>
</table>

- Wetland abandonment
- Phase of wetland use
- Tephra

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<table>
<thead>
<tr>
<th>Species</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broussonetia papyrifera (Tondo)</td>
<td></td>
</tr>
<tr>
<td>Schumannia henningsii (Ogobura)</td>
<td></td>
</tr>
<tr>
<td>Alstonia glabriflora (Hebare)</td>
<td></td>
</tr>
<tr>
<td>Schefflera sp. (Habia)</td>
<td></td>
</tr>
<tr>
<td>Strybus sp. / Ficus sp (Aliange)</td>
<td></td>
</tr>
<tr>
<td>Sauraulia sp. / Psychotria sp. (Wangoma)</td>
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</tr>
<tr>
<td>Albizia fulva (Tabayia)</td>
<td></td>
</tr>
<tr>
<td>Cinnamomum cienensis (Merua)</td>
<td></td>
</tr>
<tr>
<td>Ficus pungens (Haio)</td>
<td></td>
</tr>
<tr>
<td>Pittosporum sp. (Perege)</td>
<td></td>
</tr>
<tr>
<td>Trimenia papuana (Tali)</td>
<td></td>
</tr>
<tr>
<td>Sp. undetermined (Piibu)</td>
<td></td>
</tr>
<tr>
<td>Drosophyllum variable (Ngubili)</td>
<td></td>
</tr>
<tr>
<td>Rapania acuminatifolia / Conandrium polyanthum (Habono)</td>
<td></td>
</tr>
<tr>
<td>Araucaria cunninghamii (Guinya)</td>
<td></td>
</tr>
<tr>
<td>Medinilla sp. / Erta sp. (Laulau)</td>
<td></td>
</tr>
<tr>
<td>Octamyrthus sp. (Ere)</td>
<td></td>
</tr>
<tr>
<td>Piper sp. (Hungi)</td>
<td></td>
</tr>
<tr>
<td>Euodia latifolia / Evodiaea cauliflora (Bara)</td>
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<tr>
<td>Eurya sp. (Nagira)</td>
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</tr>
<tr>
<td>Sp. undetermined (Alugua)</td>
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</tr>
<tr>
<td>Sp. undetermined (Aluahina)</td>
<td></td>
</tr>
<tr>
<td>Pandanus antaresensis (Tawa)</td>
<td></td>
</tr>
<tr>
<td>Meremeylon hepaticum (Guhabia)</td>
<td></td>
</tr>
<tr>
<td>Macaranga sp. (Hiliwa)</td>
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</tr>
<tr>
<td>Sloanea sp. (Kuangia)</td>
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</tr>
<tr>
<td>Brevia sp. / Phyllanthus sp (Teletele)</td>
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</tr>
<tr>
<td>Campodeus arboreus (Gerebaya)</td>
<td></td>
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<tr>
<td>Ficus sp. (Huti)</td>
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</tr>
<tr>
<td>Alphoncia incana (Galoma)</td>
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</tr>
<tr>
<td>Maesa bismarckiana (Pa)</td>
<td></td>
</tr>
<tr>
<td>Dichroa lebrifuga / Graptoxyllum pictum (Mandara)</td>
<td></td>
</tr>
<tr>
<td>Ficus adenopserma (Hiri)</td>
<td></td>
</tr>
<tr>
<td>Lithocarpus rugovillosus (Haro)</td>
<td></td>
</tr>
<tr>
<td>Castanopsis acuminatifolia (Bai)</td>
<td></td>
</tr>
<tr>
<td>Acalypha sp. / Macaranga sp. (Mandi)</td>
<td></td>
</tr>
<tr>
<td>Wendlandia paniculata (Uruoba)</td>
<td></td>
</tr>
<tr>
<td>Gymnostoma papuanum (Mindira)</td>
<td></td>
</tr>
<tr>
<td>Nothofagus sp. (Dagiruba)</td>
<td></td>
</tr>
<tr>
<td>Homolanthus sp. (Embo)</td>
<td></td>
</tr>
<tr>
<td>Ficus copiosa var. 2 (Poge manguni)</td>
<td></td>
</tr>
<tr>
<td>Ficus copiosa var. 1 (Poge dendene)</td>
<td></td>
</tr>
<tr>
<td>Dodonaea viscosa (Lai)</td>
<td></td>
</tr>
<tr>
<td>Glochidion pomiferum (Mbuli)</td>
<td></td>
</tr>
<tr>
<td>Casuarina oligodon (Bauwa)</td>
<td></td>
</tr>
</tbody>
</table>

Figure B7  
Frequency of occurrence of the more common tree species in 52 Dobani gardens
Figure B8  Mean monthly, annual and extreme temperatures at Tari station [after Wood 1984 and Haberle 1993]

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Figure B13  *Hameigini* parish boundaries of the Tari area [after Allen in press]
Hameiginu names, Tari area (Figure B13):

| 400 Madaba                      | 483 Undi C                     | 644 Hawa                      | 822 Balabo                    |
| 402 Pi                          | 484 Gendo B                    | 645 Danga                     | 823 Wenani                    |
| 408 Lomo A                      | 485 Gomia A                    | 646 Agana                     | 830 Hadani                    |
| 410 Amburu                      | 486 Gomia B                    | 647 Tuliani                   | 831 Tubali                    |
| 411 Tugure                       | 490 Kenya Hongoya              | 648 Haya                      | 832 Timani                    |
| 412 Toanda                      | 491 Dabuda                     | 650 Karida Hubi               | 833 Lomo A                    |
| 421 Tobe                        | 492 Gangua                     | 655 Yobiya                    | 834 Mabiani                   |
| 422 Bangubi A                   | 493 Porali                     | 660 Dobani                    | 835 Daraga                    |
| 423 Gol Forest                  | 494 Walabini                   | 661 Peda                      | 836 Biango                    |
| 424 Bangubi B                   | 495 Uriani                     | 662 Munima                    | 838 Tubali A                  |
| 430 Dombe Kauwe                 | 496 Pariaga                    | 670 Hubi                      | 839 Lomo B                    |
| 431 Marini                      | 497 Digibi                     | 671 Arua                      | 840 Yangali                   |
| 432 Ura                         | 498 Daloanda                   | 681 Weni                      | 841 Page                      |
| 433 Tabaya                      | 500 Lewa                       | 682 Tani                      | 842 Yaluma                    |
| 434 Haro                        | 510 Piribu                     | 683 Tani Doromo               | 843 Balabo                    |
| 437 Digibi                      | 512 Baibhei Alugo              | 684 Dobani                    | 844 Derebaya                  |
| 438 Daloanda                    | 518 Bai                        | 686 Yobiya                    | 845 Dobo                      |
| 440 Bagada A                    | 520 Hadani                     | 700 Gudama                    | 846 Gandeyaba                 |
| 441 Erebe                       | 521 Halingo                    | 701 Diba                      | 852 Haro                      |
| 442 Beandali                    | 526 Diba                      | 702 Wida                      | 853 Dabuma                    |
| 443 Doria                       | 527 Wida                       | 703 Tani                      | 854 Hagoni                    |
| 444 Lewa B                      | 528 Diga                       | 704 Bibi                      | 855 Dombehala                 |
| 444 Bagada B                    | 530 Digima                     |                            |                             |
| 445 Huria                       | 538 Diga                      | 706 Bogorali                   |                             |
| 446 Tege                        | 541 Yarini                     | 707 Haro                      |                             |
| 447 Tugure                      | 543 Ereya                     | 708 Digimia                   |                             |
| 448 Lewa A                      | 547 Tamburu                   | 710 Hwa                       |                             |
| 449 Libi                        | 548 Hondobe Homane             | 711 Dumbiai                   |                             |
| 450 Erebe                       | 550 Hambuali                   | 720 Telabo                    |                             |
| 452 Wawe                        | 553 Tugua                     | 731 Dagimia                   |                             |
| 461 Libura                      | 554 Linabini                   | 732 Yumu                      |                             |
| 462 Magabo                      | 560 Bai                       | 740 Luguni Tamea              |                             |
| 463 Hogani                      | 589 Yama                      | 750 Pi                        |                             |
| 464 Wabire                      | 590 Dalibu                    | 751 Aroma                      |                             |
| 467 Tege                        | 600 Halang                     | 752 Tungabe                   |                             |
| 469 Doria Swamp                | 608 Dombe                     | 753 Mbuadu Kulua              |                             |
| 470 Bolabu                      | 610 Puyaro                    | 760 Yula                      |                             |
| 471 Haro                        | 620 Lomo B                    | 761 Tani                      |                             |
| 472 Bagada                      | 622 Haiya                     | 762 Dabu                      |                             |
| 473 Giniba                      | 623 Heli                      | 770 Undubi                    |                             |
| 474 Haria                       | 624 Doma                      | 810 Amburu                    |                             |
| 475 Bilini                      | 626 Kauwi Madaba              | 811 Dobani                    |                             |
| 476 Domca                       | 633 Pi                        | 812 Daraga                    |                             |
| 477 Lomo Bilini                 | 640 Amburu                    | 813 Hedariubi                 |                             |
| 480 Undi A                      | 641 Hubi                      | 820 Bibi                      |                             |
| 481 Nomanda                     | 642 Ayago                    | 821 Wabiago                   |                             |
| 482 Undi B                      | 643 Dombe Diba                |                             |                             |

Sources: Allen, Wood and Vail (1990), Allen in press
Fieldwork: A.W.Wood and B.J.Allen
Other Sources: Tari Research Unit, Papua New Guinea Institute of Medical Research; J.Vail and C.Ballard.
Figure B14  Frequency of occurrence of food crops in 231 Dobani garden plots
Figure B.15
Altitudinal limits for precontact crops in the Tari region

Altitude (m)

Pandanus brosios
Cordyline fruticosa
Oenanthe javanica
Ipomoea batatas
Setaria palmifolia
Rungia kloesi
Pandanus julianettii
Saccharum officinarum
Colocasia esculenta
Nicotiana tabacum
Pandanus antaresensis
Pueraria lobata
Colix (achryma-jobi)
Lagenaria sicoraria
Cucumis sativus
Amaranthus tricolor
Dioscorea alata
Zingiber officinale
Abelmoschus manihot
Musa cvs.
Pandanus conoideus
Metroxylon sagu

Lower Tagali
Paijaka
Margarima

Lebani
E Mama

Tari
Haapuga
Yaluba
Koroba
Figure B17  Frequency of occurrence of different sweet potato varieties in 231 Dobani garden plots
**Mound shape types**

- **Molo**
- **Hondene**
- **Luni**

**Planting positions on sweet potato mounds**

- **Dugu ki** (sweet potato)
- **Dugu mbira** (sweet potato)
- **Other crops**

**Mound formations**

- **Tagalene axis**
- **Godapebe**
- **Duguni axis**

**Named positions on sweet potato mounds**

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Figure B20  Environmental zones in the Tari area [after Wood 1984]
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Haepapugua map study area:
water features and drainage case study areas

1 km
FIGURE C5
Haapugua map study area:
parish boundaries
Figure C6  Drain hierarchy at Haeapugua
FIGURE C7
Haeapugua:
trackways and droveways with field system
FIGURE C9
Dobani parish:
houses and plot boundaries
FIGURE C10
Haapapuu:
extent of wetland reclamation
1959

Unreclaimed wetland
FIGURE C11
Haeapugua:
extent of wetland reclamation
1972
FIGURE C12
Hacapugua:
extent of wetland reclamation
1978
FIGURE C14
Haeapugua:
extent of wetland reclamation
1992

Unreclaimed wetland
FIGURE C15
Haepugua:
minimum extent of wetland reclamation
1959 – 1992
FIGURE C16
Haapapua:
maximum extent of wetland reclamation
1959 – 1992
FIGURE C17
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covert drains and lobate field forms
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Figure C28    Archaeological sites of the Haeapugua basin
FIGURE C29

Haeapuga:
blocks containing surface artefact scatters
FIGURE CM 30
Waloanda garden survey – artefact densities
FIGURE C36.31
Waloanda / Dobani area:
archaeological site locations
(Core 6 location approximate)
White clay (includes white clay with organic banding, dark brown organic clay, clay with shell)

Olive tephra

Carbonised contact

Black organic wood-rich clay

Figure C32  White clay unit sequences at the LOB, LOC and LOD sites
Figure C.33
Haapopuwa: profile of eastern margins

- Haeapugua swamp
- White clay fan
- Bench feature
- Abagopugua swamp
- Lagale Mandi ridge
- Fault
- Not to scale

Legend:
- Mid- to Late-Pleistocene ash and swamp deposits
- Mid-Pleistocene to Holocene peats
- Miocene limestone bedrock
Figure C34

A schematic stratigraphy for the Dohani / Walloanda area excavations.

<table>
<thead>
<tr>
<th>Units</th>
<th>LOC</th>
<th>LOB(i)</th>
<th>LOB(ii)</th>
<th>LOJ</th>
<th>LOG</th>
<th>LOI</th>
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<tbody>
<tr>
<td>Topsoil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7806</td>
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<tr>
<td>Dark grey clay</td>
<td></td>
<td></td>
<td></td>
<td>7800: 2940-1880</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light grey clay</td>
<td></td>
<td>7807: 660-240</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>White clay unit</td>
<td></td>
<td>7800: 19040-18400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7800: 21550-20490</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8754: 690-50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8755: 1280-960</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>8756: 1710-630</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^{14}$C Results (cal BP)

- 7808: 670-430
- 7809: 18840-17340
- 7807: 660-240
- 7800: 2940-1880
- 7801: 19040-18400
- 7802: 21550-20490
- 8754: 690-50
- 8755: 1280-960
- 8756: 1710-630

Symbols:
- ▼ Stone artefact(s)
- Black organic layer
- Tephras
Figure C36  Excavated trench section, Tari Gap [after Sullivan and Hughes 1991]
FIGURE C37
Swamps and catchment areas of the Turi region.
A model of the impact of sweet potato adoption in the Tari region

Adoption of sweet potato

Population increase

Increased pressure on dryland resources in favourable environments

1. Dryland extensification / migration
   - Lower altitudes
   - Increased exposure to malaria

2. Dryland intensification
   - Higher altitudes
   - Increased risk of frost

3. Wetland extensification
   - Poor soil/slopes
   - Increased soil degradation

4. Warfare
   - Levee formation
   - Desiccation
   - Increased demand for pigs

Entropic interpretation

Ritual experimentation
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TABLE B1

BASINS AND SWAMPS OF THE TARI REGION

<table>
<thead>
<tr>
<th>Basin altitude range (m)</th>
<th>Swamp name</th>
<th>Swamp altitude (m)</th>
<th>Swamp area (km²)</th>
</tr>
</thead>
</table>

A. Higher

| E Mama      | 2500-2700 | -                  | -                |
| Lebani      | 2250-2400 | 2250               | 7.7              |
| Margarima   | 2100-2600 | -                  | -                |

B. Intermediate

| Mogoropugua | 1860-2050 | Mogoropugua        | 1860 | 7.6 |
| Yaluba      | 1790-1900 | Wabupugua          | 1790 | 1.3 |
| Pajjaka plateau | 1750-1980 | -                  | -    | -   |
| Koroba/Dalipugua | 1705-1800 | Dalipugua          | 1705 | 6.9 |
| Haapugua    | 1650-1810 | Haapugua           | 1650 | 17.1|
| Tari        | 1550-1850 | Urupupugua         | 1610 | 3.3 |
| Komo        | 1540-1800 | -                  | -    | -   |
| Benalia     | 1440-2000 | -                  | -    | -   |

C. Lower

<p>| Lower Tagali valley | 1180-1700 | -                  | -                |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gu Tagali</td>
<td>Tagali river, Tari and Haeapugua basins</td>
</tr>
<tr>
<td>Gu Hanimu</td>
<td>Hanimu river, lower Tagali tributary</td>
</tr>
<tr>
<td>Gu Nagia</td>
<td>Nagia river, Koroba basin, Tagali tributary</td>
</tr>
<tr>
<td>Gu Dagia</td>
<td>Dagia river, Tari basin, lower Tagali tributary</td>
</tr>
<tr>
<td>Gu A Gabia</td>
<td>Strickland river (Huli term)</td>
</tr>
<tr>
<td>GorA Aveg</td>
<td>Strickland river (Duna term used by Huli)</td>
</tr>
<tr>
<td>Hona Lai</td>
<td>Lai river, Lai valley</td>
</tr>
<tr>
<td>Hona Wage</td>
<td>Wage river, Margarima valley</td>
</tr>
</tbody>
</table>
### TABLE B3

**HULI SOIL TERMS**

#### A. Generic terms:

- **mu**  
  sand, silt
- **dindi**  
  soil, clay
- **ibi dindi**  
  clay
- **tole**  
  stone, rock

#### B. Soil types:

- **mu**
  - **iba mu**  
    sandy alluvial soil
  - **gi mu**  
    coarse sand, gravel, small pebbles
  - **mbi mu**  
    usually identifies Tibito tephra ("darkness sand")
  - **hi mu**  
    dust

- **dindi**
  - **mbi dindi**  
    Tibito tephra; thin olive-grey gritty tephra, identified as "green" in colour, synonymous with **mbi mu**
  - **dindi mindi**  
    "black soil", commonly a rich dark brown or black humic topsoil, but refers broadly to any friable topsoil; said to incorporate elements of **ibi dindi** and **iba mu**.
  - **dindi dongoma**  
    white clay, good for taro, poor for sweet potato; includes:
    - **pele**  
      very white, waterlogged, gleyed clay
    - **durubu lene**  
      off-white, blue streaks, scratches skin (i.e. contains sand)
    - **ndodabi**  
      very sticky mixed grey clay (**dongoma** mixed with **dindi mindi**)
  - **dindi goloba**  
    red clay
  - **dindi tobe**  
    dull blue clay
  - **dindi pelalahe**  
    grey clay  
  - **dindi kui**  
    identified by Wood (1984) as dry yellow soil, but probably refers to all firm drained soil
  - **dindi kabi**  
    yellow-brown alluvial clay; particularly suitable for sweet potato
  - **dindi ambuabi**  
    yellow clay
  - **dindi gade**  
    yellow clay, **dindi abai** with added water; soft (Wood 1984 describes it as massive and hard), not good for crops; heated in fires to produce yellow ochre which is used in mourning; also referred to as **ibi dindi gade**
  - **hagua dindi**  
    gleyed, red-streaked clay

- **ibi dindi**
  - **ibi dindi abai**  
    red-brown, yellow-brown or yellow-red clay (weathered tephra); soft, good for all crops; with added water, turns into **dindi gade**
  - **ibi dindi gula:ume**  
    dry, hard clay, no good at all for crops
C. Ritual and mourning clays:

tagali taya  blue clay
*tubitubi*  ritual clay
*ambua gaga*  yellow ritual clay
*hare*  red ochre

*kalo*  mourning clay
*aga*  mourning clay
*humbrali*  mourning clay

D. Miscellaneous soil terms:

*dindi kui*  firm dry land
*iba tabu*  peat
*waru*  mud
*lumbura*  deep mud
*ira dugu*  massive buried and fossilized woody/organic layers found in the swamps (also referred to as *bambali* *kuni*)

Notes:

Huli soil terms are also given, with minor variations in orthography and meaning, by Wood (1984, Vol.1: 59-60) and Powell with Harrison (1982: 31).
TABLE B4

MAJOR GEBEANDA RITUAL SITES

A. *Dindi Pongone Gebeanda* in Huli territory

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Clan owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hibiraanda</td>
<td>Komo</td>
<td>Kuare</td>
</tr>
<tr>
<td>Irari</td>
<td>Pureni</td>
<td>Dabu, Wida</td>
</tr>
<tr>
<td>Gelote</td>
<td>Pureni</td>
<td>Dagabua</td>
</tr>
<tr>
<td>Bebenite</td>
<td>Tari Basin</td>
<td>Yangali</td>
</tr>
<tr>
<td>Garaleanda</td>
<td>Tari Basin</td>
<td>Gigira</td>
</tr>
<tr>
<td>Dabereanda</td>
<td>Tari Basin</td>
<td>Hondobe</td>
</tr>
<tr>
<td>Iba Gunu</td>
<td>Koroba</td>
<td>Baru, Wandu and Gaiyalu</td>
</tr>
</tbody>
</table>

B. *Dindi Pongone Gebeanda* in non-Huli territory

<table>
<thead>
<tr>
<th>Site</th>
<th>Ethnic group</th>
<th>Clan owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dongoya</td>
<td>Bedamini/Huli</td>
<td>Duguba Wara</td>
</tr>
<tr>
<td>Bebealia Puni</td>
<td>Bedamini/Huli</td>
<td>Duguba Bebe</td>
</tr>
<tr>
<td>Tai Yundiga</td>
<td>Ipili/Huli</td>
<td>Pulumaini</td>
</tr>
<tr>
<td>Mbibi Baite</td>
<td>Paele</td>
<td>Bibi</td>
</tr>
<tr>
<td>Gelor</td>
<td>Duna</td>
<td>Hareke?</td>
</tr>
<tr>
<td>Hewari Gambe</td>
<td>Duna</td>
<td>Wanga</td>
</tr>
<tr>
<td>Tuandaga</td>
<td>Enga/Huli</td>
<td>Yamabu and Kuari</td>
</tr>
<tr>
<td>Malaiya</td>
<td>Onabasulu</td>
<td>Not known</td>
</tr>
</tbody>
</table>
**TABLE B5**

**SOME HULI PHRATRIES**

<table>
<thead>
<tr>
<th>Phratry</th>
<th>Clan</th>
<th>Patronym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayaaya</td>
<td>Ayane</td>
<td>Aya</td>
</tr>
<tr>
<td></td>
<td>Hegani</td>
<td>Aya</td>
</tr>
<tr>
<td></td>
<td>Madaba</td>
<td>Aya</td>
</tr>
<tr>
<td></td>
<td>Tobe</td>
<td>Aya</td>
</tr>
<tr>
<td>Biribiri</td>
<td>Poro</td>
<td>Haea</td>
</tr>
<tr>
<td>&quot;Yami igini&quot;</td>
<td>Yumu</td>
<td>Bari</td>
</tr>
<tr>
<td>Dalidali</td>
<td>Aguma</td>
<td>Dali</td>
</tr>
<tr>
<td>&quot;Ni igini&quot;</td>
<td>Baru</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Berabolii</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Dega</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Gaiyalu</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Gobiya</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Kambili</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Naliba</td>
<td>Dali</td>
</tr>
<tr>
<td></td>
<td>Wandu</td>
<td>Dali</td>
</tr>
<tr>
<td>Hubihubi</td>
<td>Bari</td>
<td>Hubi</td>
</tr>
<tr>
<td>&quot;Ni igini&quot;</td>
<td>Bina</td>
<td>Hubi</td>
</tr>
<tr>
<td></td>
<td>Goma</td>
<td>Hubi</td>
</tr>
<tr>
<td></td>
<td>Humiya</td>
<td>Hulu</td>
</tr>
<tr>
<td></td>
<td>Mora</td>
<td>Hubi</td>
</tr>
<tr>
<td>Iraira</td>
<td>Dagima</td>
<td>Ngoari</td>
</tr>
<tr>
<td>&quot;Yari igini&quot;</td>
<td>Hiwa</td>
<td>Ngoari</td>
</tr>
<tr>
<td></td>
<td>Mbuda</td>
<td>Ngoari</td>
</tr>
<tr>
<td></td>
<td>Dabo</td>
<td>Ngoari</td>
</tr>
<tr>
<td></td>
<td>Tani</td>
<td>Ngoari</td>
</tr>
<tr>
<td></td>
<td>Telabo</td>
<td>Ngoari</td>
</tr>
</tbody>
</table>
### TABLE B6
PERCENTAGE VARIATION IN THE COMPOSITION OF PARISHES

<table>
<thead>
<tr>
<th>Parish</th>
<th>Period</th>
<th>Residential Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>tene</td>
</tr>
<tr>
<td>Average</td>
<td>1955-60</td>
<td>27</td>
</tr>
<tr>
<td>Toanda</td>
<td>1955-60</td>
<td>20</td>
</tr>
<tr>
<td>Toanda</td>
<td>1979</td>
<td>49</td>
</tr>
<tr>
<td>Koma</td>
<td>1977-78</td>
<td>50</td>
</tr>
<tr>
<td>Tobani</td>
<td>1977-78</td>
<td>26</td>
</tr>
<tr>
<td>Hambuali</td>
<td>1977-79</td>
<td>25</td>
</tr>
</tbody>
</table>

Locations and Sources:
1 Tari Basin (Glasse 1992:246); an average of five parishes
2 Tari Basin (Glasse 1968:29-30)
3 Tari Basin (Grant 1979); status of 2% of residents undetermined
4 Yaluba Basin (Goldman 1981a:466)
5 Yaluba Basin (Goldman 1981a:466)
6 Tari Basin (Frankel 1986:43)
### TABLE B7

**VARIATION WITH ALTITUDE IN MATURATION RATES FOR TARO AND SWEET POTATO**

<table>
<thead>
<tr>
<th>Location</th>
<th>Altitude (m)</th>
<th>Taro (months)</th>
<th>Sweet Potato (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Simbu³</td>
<td>2570</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Upper Wage¹</td>
<td>2550</td>
<td>19-28</td>
<td>7-12</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>2470</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Porgera²</td>
<td>2450</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>2400</td>
<td>26</td>
<td>-</td>
</tr>
<tr>
<td>Porgera²</td>
<td>2300</td>
<td>12-15</td>
<td>10-12</td>
</tr>
<tr>
<td>Lebani⁸</td>
<td>2300</td>
<td>14+</td>
<td>7+</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>2160</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Tambul⁵</td>
<td>2125</td>
<td>12+</td>
<td>-</td>
</tr>
<tr>
<td>Telefomin⁷</td>
<td>2000-2150</td>
<td>24</td>
<td>-</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>2000</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>1900</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Jimi Valley⁴</td>
<td>1850</td>
<td>9</td>
<td>-</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>1800</td>
<td>-</td>
<td>6-7</td>
</tr>
<tr>
<td>Porgera²</td>
<td>1800-2000</td>
<td>&lt;12</td>
<td>8</td>
</tr>
<tr>
<td>Mt Hagen⁶</td>
<td>1650</td>
<td>12-13</td>
<td>8</td>
</tr>
<tr>
<td>Mt Hagen⁴</td>
<td>1650</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>1540</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>North Simbu³</td>
<td>1500</td>
<td>11-12</td>
<td>-</td>
</tr>
<tr>
<td>Jimi Valley⁴</td>
<td>1200</td>
<td>6</td>
<td>-</td>
</tr>
</tbody>
</table>

**Sources:**
1. Wohlt (1978)
2. Hughes and Sullivan (1990)
4. Clarke (1977)
5. Bayliss-Smith (1985a)
6. Bayliss-Smith and Golson (1992a)
8. Ballard, Fieldnotes
TABLE B8

HULI GENERIC CROP TERMS RELATING TO MORE THAN ONE SPECIES

aiuba  amaranthus - covers Amaranthus tricolor, A. cruentus and other Amaranthus species.

anga  [high altitude] pandanus - the generic label for both karuka pandanus (Pandanus julianettii: anga) and the "wild" pandanus (Pandanus brosimos: anga mundiya), but not for the lower-lying marita pandanus (Pandanus conoicetus: abare).

auwa  auwa auwa ("true auwa") refers to Rorippa sp., auwa ibilira to Cardamine hirsuta.

bambo  cucumber - a pre-contact term for Cucumis sativus, extended to bambo gini ("bambo-offspring") for the introduced pumpkin (Cucurbita moschata), the latter possibly exploiting the apparent homophony between the Huli (bambo gini) and English (pumpkin) terms.

hai  banana - covers plants of both the Australimusa and Eumusa (diploid and triploid) sections, and also all of the wild, inedible banana species known to the Huli.

homa  kudzu - refers to both cultivated (homa: Pueraria lobata) and wild forms (homa bawi: ?Dioscorea nummularia / ?Pueraria sp.)

ma  taro - used in reference both to cultivars of Colocasia esculenta (e.g. ma abarapu for the abarapu cultivar) and to possible wild Alocasia taro species (e.g. ma dale, ma andaguru).

yu  fern - identifies species from a number of different fern genera, including Cyclosorus, Saurauia and Cyathea.
<table>
<thead>
<tr>
<th>Common term:</th>
<th>Praise term:</th>
<th>Scientific term:</th>
</tr>
</thead>
<tbody>
<tr>
<td>hina</td>
<td>alu muguba</td>
<td>Ipomoea batatas</td>
</tr>
<tr>
<td>kuli hina</td>
<td>gayawi kuli</td>
<td>Ipomoea batatas cv.</td>
</tr>
<tr>
<td>ma</td>
<td>hubi gaea</td>
<td>Colocasia esculenta</td>
</tr>
<tr>
<td>hai</td>
<td>habo waya</td>
<td>Musa sp.</td>
</tr>
<tr>
<td>hai giabi</td>
<td>wayali giabi</td>
<td>Musa cv.</td>
</tr>
<tr>
<td>baya</td>
<td>walu baya</td>
<td>Holoclamys sp.</td>
</tr>
<tr>
<td>yu</td>
<td>wongoli waebabe</td>
<td>Unidentified fern sp.</td>
</tr>
<tr>
<td>du</td>
<td>hiwa tege</td>
<td>Saccharum officinarum</td>
</tr>
<tr>
<td>tiabu</td>
<td>goloba anguma</td>
<td>Setaria palmifolia</td>
</tr>
<tr>
<td>nandi</td>
<td>nandi gae</td>
<td>Dioscorea alata</td>
</tr>
<tr>
<td>gereba</td>
<td>uru gereba</td>
<td>Rungia klossii</td>
</tr>
<tr>
<td>tigibi</td>
<td>ugu tigibi</td>
<td>Oenanthe javanica</td>
</tr>
<tr>
<td>aluba</td>
<td>hundu aluba</td>
<td>Amaranthus sp.</td>
</tr>
<tr>
<td>mbagua</td>
<td>mbagua ugumi</td>
<td>Lagenaria siceraria</td>
</tr>
<tr>
<td>abare</td>
<td>mau wallo</td>
<td>Pandanus conoides</td>
</tr>
<tr>
<td>anga</td>
<td>doro wale</td>
<td>Pandanus julianettii</td>
</tr>
<tr>
<td>homai</td>
<td>yuwi</td>
<td>Pandanus brosimos</td>
</tr>
<tr>
<td>palena</td>
<td>pongo wabe</td>
<td>Zingiber officinale</td>
</tr>
<tr>
<td>yu</td>
<td>mali wango</td>
<td>Cyclosurus sp.</td>
</tr>
<tr>
<td>mundu</td>
<td>uru lumuni</td>
<td>Nicotiana tabacum</td>
</tr>
</tbody>
</table>
**TABLE B10**

**RELATIVE ANTIQUITY OF DIFFERENT SWEET POTATO CULTIVARS**

These phases for the introduction of different sweet potato cultivars are based on the views of nine older men from the following areas: Komo (1), Mogoropugua (2), Lebani (2) and Haeapugua (4).

1. First cultivar (agreed upon by all those (7 of 9) who nominated a first cultivar):

   *muguba / digi hina*

2. Pre-contact (numbers in brackets refer to the number of identifications by different individuals; cultivars identified by only one person are not listed):

   *mogia / magaya (8)*
   *mandiyame (6)*
   *daria (6)*
   *giambu (4)*
   *kuli (4)*
   *tianobi (4)*
   *ma hina (4)*
   *parima / mole / gora awa (4)*
   *dambali (3)*
   *auwaeri (3)*
   *aluguai (3)*
   *irali (3)*
   *aliga (3)*
   *hangapo (3)*
   *gabitusu (2)*
   *kandugua (2)*
   *pe (2)*
   *kagwa (2)*
   *teboloopa (2)*
   *iri hina (2)*

There was some dispute over the following cultivars, for which the first figure is the number of people who identified the cultivar as pre-contact, the second referring to those who thought it was post-contact:

   *biiyu (3/1)*
   *heme (2/3)*
   *hai (1/2)*
   *tugulu (1/2)*

3. Early contact (1934 - 1945): (all identified by four or more individuals)

   *bo hina*
   *dambera*
   *gebe / dama / mame*

4. Post-1950: (all identified by two or more individuals)

   *benalia, dabura, dambera, ganduma, habia, iriyale, kayani, piyu, wamnun, iba, didiman*
TABLE B11

A HISTORICAL REGISTER OF HULI CROPS

1. *Ira Goba Naga* ("the time of rotten wood")

   *ira goba* ("rotten wood")
   *nano* (mushroom sp.)
   *homa bawi* (? *Dioscorea nummularia* / ? *Pueraria* sp.)
   *yagua* (fern sp.)
   *yu* (fern sp.)
   *tumbu* (? *Alocasia* sp.)
   *ma dale* (? *Alocasia* sp.)

2. *Ma Naga* ("the time of taro")

   *ma* (*Colocasia esculenta*)
   *hai* (*Musa* cvs.)
   *du* (*Saccharum officinarum*)
   *tiabu* (*Setaria palmifolia*)
   *gereba* (*Rurgia klossii*)
   *tigibi* (*Oenanth javanica*)
   *aluba* (*Amaranthus tricolor*)
   *bambo* (*Cucumis sativus*)
   *mbagua* (*Lagenaria siceraria*)
   *nandi* (*Dioscorea alata*)
   *paboro* (*Psophocarpus tetragonolobus*? *Lablab purpureus*?)
   *palena* (*Zingiber officinale*)

3. *Hina Naga* ("the time of sweet potato")

   *hina* (*Ipomoea batatas*)
   *mundu* (*Nicotiana tabacum*)

4. 1930s - 1950 (Early Colonial Contact)

   Aibika?, Corn, Potato, Peanut, Pumpkin, Shallot, Cabbage, Runner bean (from Kutubu)

5. 1950 - present (Late Colonial Contact / Independence)

   Tomato, *Xanthosoma* taro, Common bean, Winged bean?, *Amaranthus cruentus*,
   *Amaranthus caudatus*, Pineapple, Watercress, Carrot, Lemon, Lime, Orange,
   Passionfruit, Pea, Avocado, Capsicum, Choko, Chinese cabbage, Soya bean,
   Tree tomato. Breadfruit, Chili, Eggplant, Coffee
TABLE B12

HULI WOODEN TOOL TYPES

A. Generic wooden tool terms:

keba / geba: spade (properly male)
nama / lama: digging stick (properly female)

B. Wood species terms:

These terms are used in combination with tool terms and denote "ideal" woods for each tool, though a wide range of wood species were actually used in the construction of most tool types.

ayaga: Areca sp.
habono: Rapanea acuminatifolia
hewe: Quintinia mutantiflora
mandara: Grapsothyllum pictum / Dichroa febrifuga
mbada: Euodia latifolia

C. Tool type terms:

ayaga gembo - short, double-paddled ceremonial spade carried by women in mourning [gembo: "rage"]
ayaga keba - long-handled, single-paddled men's spade; 110-133 cm in length, with an oval-sectioned blade 30-50 cm long and 8-14 cm wide
*ayaga nama - long, single-paddled men's spade?
gula - women's digging stick carried by male transvestite performers (endeal) in tege rituals
habono - men's digging and grass-cutting stick; similar in size and form to homabu, but with a flattered tip; 120-150 cm in length
halimbu - women's walking stick
*hewe - double-paddled spade?
hina nama - women's short digging stick for extracting sweet potato from hearths (the functional equivalent of pero for men)
homabu - men's heavy pointed digging stick; 150-180 cm in length, 6-10 cm in diameter
iba wango / walango - long hook made of aliange wood; used by men to clear drains and garden surfaces of cut vegetation
ma habono - heavy, round-ended taro dibbling stick used by men; 80-128 cm in length, diameter ranging from 9.5 cm near the base to 5 cm at the handle
mandara nama - women's digging and planting stick; 60-120 cm in length, 2.5-4 cm in diameter; often with thin paddle-blade at one end, 4.5-6 cm in width and 14-33 cm in length
mbada keba - men's paddle-spade, virtually identical to ayaga keba; one example measured 118 cm in length, 3.5-4.5 cm in diameter, with a blade 8.5 cm wide and 27 cm long
mondo lawini? - digging-stick used to harvest sweet potato from mounds (mondo: mound; lawini: girlfriend/boyfriend)
pero - bamboo fire-tongs, exclusively for male use

* These two tool types were described (as "hewe" and "ayaganama") at Haepugua in the 1970s (Powell with Harrison 1982). I was unable to find anyone who could recall either term or remember seeing a large double-paddled spade. Double-paddled spades are known from the Wahgi swamp (Gorecki 1978), but none have been found in the swamps of the Tari region.
"Ayaganama" is presumably a synonym for ayaga keba, as it describes the same tool, but the use of the term nama, which is usually reserved for women's digging sticks, is puzzling.
TABLE B13

HULI DITCH AND FENCE TYPES

A. Ditches:

- **gana** - generic term for all ditches or redirected watercourses
- **de gana / hagua gana** - an internal drain or plot marker within a garden; typical dimensions: 80 cm wide, 20 cm deep (*hiba hagua*: muddy water)
- **hiba ganarua** - a small drainage ditch running beneath the eaves of a house; typical dimensions: 50 cm wide, 10 cm deep
- **hiba puni** ("water-drain") - a ditch that drains water, used largely in reference to wetland ditches; dimensions range up to 3 m deep and 5 m wide
- **mabu gana** ("garden-ditch") - a standard dryland *gana* around the boundaries of a garden; dimensions range up to 5m deep and 3.5m wide
- **wai pabe gana / pabeanda gana** ("war-fence-ditch") - a ditch dug or deepened around a communal men's house during war; dimensions generally at the larger end of the range of *mabu gana*
- **hariga** - major *gana* used as a thoroughfare by people and pigs

B. Fences:

- **pabe** - generic term for fences; also refers specifically to fences consisting of sharp-tipped stakes (*pi*) planted upright in close formation
- **amalaya** - fence consisting of planks laid side on, piled on top of each other between spaced upright supports
- **pabe wede** - large pig-fence
- **panga** - arched gate within a *pabe* fence or in the base of a major *gana* to control passage
**TABLE B14**

*MA ULI*: DIMENSIONS AND SPACING OF TARO HOLES

<table>
<thead>
<tr>
<th>Location (n)</th>
<th>Mean maximum diameter [range] (cm)</th>
<th>Mean minimum diameter [range] (cm)</th>
<th>Mean depth [range] (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>gana habane</em> (21) (base of ditch)</td>
<td>30.4 [22-41]</td>
<td>30.0 [21-34]</td>
<td>25.2 [18-31]</td>
</tr>
</tbody>
</table>

*Ma uli* spacing on top of *gana habane* (n = 42): mean average of 16.7 cm between holes, with a range between 9 cm and 24 cm.
TABLE B15

CONSTRUCTION SEQUENCE FOR COMPOSTED MOUNDS (MONDO)

1. *anda ha* ("clear") - the old garden surface is cleared of grass and leaves

2. *noko helo* ("push/lead pigs") - pigs are brought in to root for worms and small tubers left from the previous garden

3. *ginu bia* ("play?") - uprooted weeds and old vines are gathered in rows of evenly spaced clusters

4. *go da* ("make mounds") - mounds are constructed using these piles of detritus and the soil of old mounds

5. *hina wai hanga* ("plant sweet potato vines") - vines are planted into the mounds

6. *tani bia* ("weed") - weeding (several events)

7. *hina wa* ("harves: sweet potato") - the sweet potato is either harvested from the mounds in one event, if it is for pig fodder or a feast, or it is taken out progressively as needed over a period of several days for human consumption (Rose (1979) has demonstrated higher yields from progressive harvests of Tari region mounds).
**TABLE B16**

**MONDO (COMPOSTED MOUND) DIMENSIONS**

<table>
<thead>
<tr>
<th>LOC</th>
<th>N</th>
<th>ALT</th>
<th>MAH</th>
<th>MAD</th>
<th>MID</th>
<th>HPL</th>
<th>LPL</th>
<th>NSN</th>
<th>NVI</th>
<th>NVA</th>
<th>MIS</th>
<th>MAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>25</td>
<td>2260</td>
<td>52</td>
<td>211</td>
<td>189</td>
<td>48</td>
<td>36</td>
<td>15</td>
<td>3</td>
<td>4</td>
<td>35</td>
<td>56</td>
</tr>
<tr>
<td>M</td>
<td>25</td>
<td>1870</td>
<td>54</td>
<td>198</td>
<td>188</td>
<td>47</td>
<td>41</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>30</td>
<td>94</td>
</tr>
<tr>
<td>H</td>
<td>20</td>
<td>1650</td>
<td>54</td>
<td>270</td>
<td>248</td>
<td>49</td>
<td>36</td>
<td>13</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>K</td>
<td>10</td>
<td>1540</td>
<td>50</td>
<td>330</td>
<td>226</td>
<td>50</td>
<td>30</td>
<td>28</td>
<td>3</td>
<td>5</td>
<td>37</td>
<td>63</td>
</tr>
<tr>
<td>Y</td>
<td>20</td>
<td>1240</td>
<td>45</td>
<td>154</td>
<td>145</td>
<td>45</td>
<td>33</td>
<td>7</td>
<td>2</td>
<td>-</td>
<td>29</td>
<td>47</td>
</tr>
<tr>
<td>C</td>
<td>100</td>
<td>-----</td>
<td>51</td>
<td>220</td>
<td>196</td>
<td>48</td>
<td>36</td>
<td>12</td>
<td>3</td>
<td>3</td>
<td>32</td>
<td>67</td>
</tr>
</tbody>
</table>

1 - three measurements only
2 - between 3 and 5 vines per planting, depending on size of vine

**Abbreviations:**

LOC - Location of mounds

L - Lebani, slope garden
M - Mogoropuwa, wetland garden
H - Haeapuwa, wetland garden
K - Kono, wetland garden
Y - Yokona (Duna), slope garden
C - Composite

N - Number of mounds measured
ALT - Altitude of location (metres above sea level)
MAH - Maximum height of mound (mean average, in cm)
MAD - Maximum diameter of mound (mean average, in cm)
MID - Minimum diameter of mound (mean average, in cm)
HPL - Highest planting position on mound (mean average, in cm)
LPL - Lowest planting position on mound (mean average, in cm)
NSN - Number of planting stations per mound
NVI - Number of sweet potato vines per planting station
NVA - Number of sweet potato varieties per mound
MIS - Minimum spacing between mounds (mean average, in cm)
MAS - Maximum spacing between mounds (mean average, in cm)
TABLE B17

DRYLAND GARDEN SEQUENCE

[Ideal sequence proceeds from 1 to 9]

1. IRABU ("primary forest") - forest cover

2. E MA / EIMA ("taro swidden garden")
   - amalaya (fence) constructed around garden
   - e hiraga ("burn the swidden garden") - detritus burnt, larger trees ringbarked or burnt at base
   - e dintili ("dibble-plant the swidden garden") - individual sweet potato vines dilled, harvested after 5 months

3. O DA BIA ("do the burning")
   - e gela ("clear the swidden garden") / dugua ("pull up") - grass cleared with habono digging stick, heaped in piles
   - e hiraga ("burn the swidden garden") - grass and other detritus burnt and then re-gathered
   - minor tillage; wide range of crops planted; second dilled planting of sweet potato, which is harvested after 5 months; may include:
   - e panamondo ("small swidden mounds") - constructed using burnt detritus and a small quantity of soil cover; harvesting of sweet potato from e panamondo signals the onset of complete tillage

4. E GODA / GODA PEGENA ("make mounds in the swidden garden")
   - complete tillage
   - mixed garden, with sweet potato planted in large composted mounds (mondo)

5. MABU ("fixed garden")/ MONDO MABU ("mounded garden")/ E HONDENE ("mounded swidden gardea")/ E HINA (sweet potato swidden garden")
   - established mounded sweet potato garden; crop range reduced from previous stages and reduces further during course of two to three sweet potato harvests
   - labu ("abandoned garden") - total abandonment of garden

6. EMBERA ("in disuse") - short grass fallow (Ischaemum polystachyum, or Imperata cylindrica if soil is poor)

7. GAMBETE ("long grass groove") - long grass fallow (Miscanthus floridulus)

8. IRABU GAMBETE ("forest and long grass groove")/ E TABAYIA ("swidden Albizia forest") - woody fallow

9. IRATE ("woody groove") - secondary forest; reverts to irabu (primary forest)
TABLE B18

WETLAND GARDEN SEQUENCE

[Ideal sequence proceeds from 1 to 7]

1. BOLANGE ("Leersia grass") - Swamp grass (Leersia hexandra) cover

2. IBA DADAPU ("drain the water")
   - drainage ditches (iba puni) excavated or cleared with iba wango rakes
   - enclosing ditches (gana) dug around garden area
   - garden left to dry out for up to two years

3. LARA ("wetland swidden")
   - yu / bolange gendu ("cut tall grass") - tall grass cleared from garden surface
   - de ("?"?) - grass cleared along line of de gana
   - bugu ("?") - borders of internal boundary ditches (de gana) marked with paddle spades
   - internal boundary ditches (de gana) dug; spoil spread over garden surface and trampled down over grass
   - lara hina ("sweet potato wetland swidden") - habono digging sticks used to dibble sweet potato vines into garden surface
   - lara tani ("weed wetland swidden") - garden surface weeded by men and women once every month
   - hina wa ("take out sweet potato") - sweet potato harvested after 5 months
   - e hina pu ("harvested swidden garden") - short grass fallow for 1 to 2 months
   - lara sequence repeated a second time

4. TABU
   - lara anda ha ("sweep wetland swidden garden") - clear grass after fallow
   - e gela ("clear swidden") - weed and grass detritus cleared
   - e hira ("burn swidden") - heaped grass and weeds burnt
   - e anda ha ("sweep swidden") - remaining detritus gathered in heaps
   - dindii wa ("dig up the ground")/ e ali ("dig over the swidden") - soil excavated for mound material
   - mabu hi la - women break up soil for mounds
   - lara tabu / tabu bo go da - first mounds constructed
   - hina wai hanga ("plant sweet potato vines") - sweet potato vines planted in mounds
   - tani bia ("weed") - garden weeded two to three times
   - hina wa ("harvest sweet potato") - sweet potato harvested
   - e hina pu ("harvested swidden garden") - short grass fallow

5. MABU ("fixed garden")
   - sequence as above for tabu, but of indefinite length: sugarcane, Rorippa added, each cropping cycle concluding with:
     - mabu hina pu ("harvested garden") - short grass fallow

6. EMBERA ("in disuse")
   - long fallow, followed either by re-excavation of all ditches and re-activation of the garden cycle, or:

7. PUGUA TAGIRA ("swamp comes out")/ BOLANGE ("Leersia grass")
   - full reversion to swamp
TABLE B19

TYPES OF MALE HULI LEADER

Ascribed Ritual Leadership

gebeali ("ancestor man") - men from specific lineages in each clan who hold the responsibility for ritual performances addressed to ancestral damu spirits at gebeanda ritual sites; also known as gebe gamuyi ("gebe spell holder").

dindi pongoneyi ("holder of the root of the earth") - gebeali leaders at the largest gebeanda ritual sites along the the root of the earth (dindi pongone), such as Gelote and Bebenite.

Achieved Ritual Leadership

gamuyi ("spell holder") - men with a reputation for possessing a wide stock of gamu spells which they provide to others in return for payment.

liruali ("liru (ritual stone) man") - men with specialist knowledge and spells who perform rituals addressed to liru stones; also, in the context of tege pulu rituals, those who instruct the uriiali officials in appropriate procedure.

uriiali (uri (?) man") - officiants at the tege pulu ritual; with experience and a series of payments to liruali, uriiali eventually attain liruali status.

Ascribed Secular Leadership

agali haguene ("head man") - the senior man in the senior lineage of a clan; ideally, the ultimate repository of knowledge about clan origins (dindi malu) and clan genealogies (malu) and the sole individual with the right to deliver such knowledge in the formal damba bi speech genre in public forums such as disputes; otherwise referred to as damba bi laga ("damba bi sayer").

Achieved Secular Leadership

agali homogo ("rich man") - men deemed wealthy in terms of their ability to produce or marshal resources such as pigs; synonyms, all of which stress the role of pigs in the status of homogo, include: nogo hini ("pig owner"), nogo baga ("pig killer"), nogo homogo ("rich in pigs"). Referred to in contemporary contexts as "big men".

agali wai biaga ("fight maker man") - war leaders; often men with a reputation for initiating, and thus being able to co-ordinate compensation for, wars; sometimes distinguished by the praise term pari wayali to mark their ability to stay free from wounds; synonyms include: bogaga ("killer"), wai taya biaga ("fight maker"), agali bolenege ("man killer or killer man").

agali bi laga ("speech sayer") - often synonymous with the status of agali haguene, but generally used in reference to other individuals knowledgeable in terms of lineage genealogies and capable of serving the function of agali haguene at disputes; typically said to be capable of negotiating peace between opposing lineages; otherwise referred to as bi loline ("speech sayer").

agali dombeni ("middle man") - men who mediate between clans to both of which they are related. Such men are usually resident along the common boundaries of the two clans, where these are adjacent; synonyms include: dombeniali, agali hanuni ("middle man") and dombe kua ("middle (?)").
TABLE B20

HULI FOOD PROSCRIPTIONS

1. Forbidden to all men:
   - the *emberali* variety of Highland pitpit
   - all eel species (see myth in Narrative B2)
   - insects (with some minor exceptions)
   - pig intestines, ears and trotters

2. Forbidden to younger married men:
   - most or all possum species

3. Forbidden to young or unmarried men:
   - the *hogo* variety of banana
   - all yams
   - the *puruni* snake
   - ginger (*palena garo*)

4. Forbidden to all women:
   - all parts of pigs which died of disease
   - tobacco
   - all yams
   - the *hogo* variety of banana
   - shoots of the areca palm

5. Forbidden to young or unmarried women:
   - all insects

6. Reserved for men:
   - neck and backbone parts of pig

7. Reserved for women:
   - tail, head and intestine parts of pig
<table>
<thead>
<tr>
<th>Form / Type</th>
<th>State</th>
<th>Size 1</th>
<th>Size 2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compensation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Nogo abidamba</em></td>
<td>L</td>
<td>30</td>
<td>60-750</td>
<td>Major compensation paid by a <em>wai tene</em> war leader to his allies for the death or wounding of their members; usually preceded by a <em>nogo dabua</em> payment.</td>
</tr>
<tr>
<td><em>Nogo dabua</em></td>
<td>L</td>
<td>5-6</td>
<td>45</td>
<td>Initial compensation paid by a <em>wai tene</em> to his allies for the death or wounding of their members, in order to forestall immediate attempts at revenge on his own kin.</td>
</tr>
<tr>
<td><em>Nogo gima</em></td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>Payment by a <em>wai tene</em> to an ally who has killed an enemy; restricted amongst Huli to the Yaluba, Mogoropugua and Lebani areas, and said to be a Duna custom.</td>
</tr>
<tr>
<td><em>Nogo mabura</em></td>
<td>D&gt;L</td>
<td>3&gt;30</td>
<td>x</td>
<td>Payment made by an individual who has killed someone in war to the victim’s kin or allies; paid only if the killer is identified.</td>
</tr>
<tr>
<td><em>Nogo magu</em></td>
<td>L</td>
<td>45-60</td>
<td>10</td>
<td>Pigs given as a loan to allies to enable them to meet compensation demands.</td>
</tr>
<tr>
<td><em>Nogo nigi</em></td>
<td>L</td>
<td>1-2</td>
<td>1</td>
<td>Payment made by a <em>wai tene</em> to allies for their injuries; also known as <em>nogo kaga</em>.</td>
</tr>
<tr>
<td>Form / Type</td>
<td>State</td>
<td>Size 1</td>
<td>Size 2</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>--------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Nogo palipalo</td>
<td>L/D</td>
<td>2</td>
<td>x</td>
<td>Payment of one pig each made between enemies to mark the cessation of warfare, particularly in instances where no deaths or injuries have been sustained on either side.</td>
</tr>
<tr>
<td>Nogo tauwa</td>
<td>L</td>
<td>2</td>
<td>2-10</td>
<td>Payment made by a man to the parents or kin of a woman with whom he has had illicit sex (i.e. sex without the prior payment of wariabu brideprice). Payments now vary with size according to the marital status of the woman.</td>
</tr>
<tr>
<td>Nogo timu</td>
<td>L&gt;D</td>
<td>2&gt;30</td>
<td>22&gt;625</td>
<td>Payment for a victim of war made by the opposing wai tene to the victim's kin. Like compensations made to allies, these payments are conducted in two phases: preliminary dabua and major abi stages.</td>
</tr>
</tbody>
</table>

**Marriage / Childhood**

<table>
<thead>
<tr>
<th>Ma hiralu</th>
<th>D</th>
<th>1</th>
<th>1-10</th>
<th>The former celebration of an infant's survival to the first year, marked by the father killing a pig. Replaced since mission contact by the &quot;birthday&quot; celebration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nogo ndi tingi</td>
<td>D</td>
<td>1</td>
<td>x</td>
<td>Pig killed by a man to celebrate his first marriage, of which a quarter section is given to the wife and the stomach is given to an older woman giving instruction (dagia gamu) to the wife; also known as nogo bo dawa hana.</td>
</tr>
<tr>
<td>Nogo tuai</td>
<td>D</td>
<td>1</td>
<td>x</td>
<td>Pig killed by a man before having sexual intercourse with his wife for the first time.</td>
</tr>
<tr>
<td>Nogo wariabu</td>
<td>L</td>
<td>14-17</td>
<td>30-45</td>
<td>Pigs paid by a man and his kin as brideprice to the kin of his wife. Effectively a form of compensation, as implied by the etymological gloss wari [wali] (woman) + abu [abi] (compensation) (Goldman 1981b).</td>
</tr>
<tr>
<td>Form / Type</td>
<td>State</td>
<td>Size 1</td>
<td>Size 2</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
<td>--------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Ritual</strong>:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Gebe nogo</em></td>
<td>D</td>
<td>1-25</td>
<td>x</td>
<td>Pigs given to <em>gebeali</em> ritual officiants by individuals sponsoring performances of <em>gebe</em> rituals; also known as <em>burugu abi nogo</em>.</td>
</tr>
<tr>
<td><em>Iba tiri nogo</em></td>
<td>D</td>
<td>1</td>
<td>x</td>
<td>Individual pigs sacrificed in the course of <em>dindi bayabaya</em> rituals at major <em>gebeanda</em> ritual sites; known at the Bebenite <em>gebeanda as nogo yabe</em>.</td>
</tr>
<tr>
<td><em>Liru nogo</em></td>
<td>D</td>
<td>1-3?</td>
<td>x</td>
<td>Pigs given to <em>liruali</em> ritual officiants by individuals sponsoring a ritual involving <em>liru</em> ritual stones.</td>
</tr>
<tr>
<td><em>Tege nogo</em></td>
<td>D</td>
<td>20-120</td>
<td>x</td>
<td>Inclusive category for all pigs killed and sacrificed at <em>tege</em> rituals; terms for pigs employed in individual components of the <em>tege</em> ritual include: <em>balu nogo, pari nogo, wa nogo, guru nogo, ngui mago</em>.</td>
</tr>
</tbody>
</table>

**KEY**

- **State**: State of pigs in transaction: L (Live) / D (Dead)
- **Size 1**: Common size of payment in 1940s and early 1950s.
- **Size 2**: Common size of payment in 1980s and early 1990s.
- **>**: Denotes sequence of payments (e.g. 3>30 = 3 pigs in first phase, 30 in second phase of payment).
- **x**: Form of compensation now defunct.
- **/**: No preference for live or dead state in payment.
- **?**: State/size of payment not known.
### TABLE B22

**AGRICULTURAL POTENTIAL OF DIFFERENT LAND TYPES IN THE TARI REGION**

<table>
<thead>
<tr>
<th>LAND TYPE/ Environmental zone</th>
<th>Mean sweet potato yield (t/ha/yr)</th>
<th>Ratio of pigs/people</th>
<th>Wetlands as % of total area</th>
<th>Population density 1 (no/km²)</th>
<th>Population density 2 (no/km²)</th>
<th>Yield decline (t/ha/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEATY WETLANDS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haecapugua swamp</td>
<td>11.3-13.8</td>
<td>2.17</td>
<td>40.9</td>
<td>93</td>
<td>137</td>
<td>0.37-0.63</td>
</tr>
<tr>
<td>Wabia plains</td>
<td>13.0</td>
<td>2.14</td>
<td>25.6</td>
<td>149</td>
<td>166</td>
<td>0.05</td>
</tr>
<tr>
<td><strong>COLLUVIAL/ALLUVIAL PLAINS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debi floodplain</td>
<td>10.3</td>
<td>1.71</td>
<td>15.9</td>
<td>188</td>
<td>196</td>
<td>0.006</td>
</tr>
<tr>
<td><strong>VOLCANIC ASH PLAINS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tari plains</td>
<td>6.3</td>
<td>1.71</td>
<td>3.6</td>
<td>135</td>
<td>138</td>
<td>0.50</td>
</tr>
<tr>
<td>Poro plains</td>
<td>8.2</td>
<td>1.56</td>
<td>1.1</td>
<td>92</td>
<td>93</td>
<td>0.43-1.21</td>
</tr>
<tr>
<td>Andobare plains</td>
<td>6.9</td>
<td>1.21</td>
<td>1.2</td>
<td>68</td>
<td>70</td>
<td>1.22-1.60</td>
</tr>
<tr>
<td>Paijaka plateau</td>
<td>5.1</td>
<td>1.08</td>
<td>0.9</td>
<td>37</td>
<td>39</td>
<td>1.03-2.52</td>
</tr>
</tbody>
</table>

**Notes:**
2. Population Density 2 represents a recalculated population density which excludes the unoccupied wetland areas of each zone.
3. All figures in this table, other than the recalculated Population Density 2, are derived from Wood (1984).
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auwa ibillira</td>
<td>Cardamine hirsuta</td>
</tr>
<tr>
<td>ayage</td>
<td>pith of the black palm (Areca sp.)</td>
</tr>
<tr>
<td>emberali</td>
<td>inflorescence of Setaria palmifolia cv. (Highland pitpit)</td>
</tr>
<tr>
<td>gereba</td>
<td>Rungia klossii (Acanth spinach)</td>
</tr>
<tr>
<td>gondo</td>
<td>Floscopia scandens / Commelina sp.</td>
</tr>
<tr>
<td>hai</td>
<td>banana pseudostem hearts</td>
</tr>
<tr>
<td>hima</td>
<td>inflorescence of Saccharum edule (Lowland pitpit)</td>
</tr>
<tr>
<td>hina wai</td>
<td>sweet potato vines and leaves</td>
</tr>
<tr>
<td>homa</td>
<td>Pueraria lobata (Kudzu)</td>
</tr>
<tr>
<td>homa bawi</td>
<td>“wild” Pueraria (possibly a wild Dioscorea, see Sillitoe 1983:44, n.15 on the Wola bawty tuber, an apparent cognate for the Huli bawi)</td>
</tr>
<tr>
<td>mamunali</td>
<td>Rubus rosifolius (Raspberry)</td>
</tr>
<tr>
<td>tigibi poroporo</td>
<td>Oenanthe javanica (Javanese dropwort)</td>
</tr>
<tr>
<td>poge, pogeli</td>
<td>Ficus spp. (Fig leaves and fruit)</td>
</tr>
<tr>
<td>Taro (ma) leaves</td>
<td></td>
</tr>
<tr>
<td>Bamboo shoots</td>
<td></td>
</tr>
<tr>
<td>Various mushrooms</td>
<td>and fungi (nano, ira lumbi)</td>
</tr>
<tr>
<td>Various ferns</td>
<td>(Cyathea spp., Cyclosurus spp.)</td>
</tr>
<tr>
<td>Small sweet potato</td>
<td>tubers foraged from fallow gardens, steamed in bamboo tubes (because roasting would consume them completely)</td>
</tr>
</tbody>
</table>
TABLE B24

A CHRONOLOGY OF "NATURAL" HAZARD AND CATAclySMic EVENTS OF THE TWENTIETH CENTURY IN THE TARI REGION

? = attribution of date to event not confirmed independently

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td>?Severe drought and frost</td>
</tr>
<tr>
<td>1914</td>
<td>?Severe drought and frost</td>
</tr>
<tr>
<td>1922</td>
<td>19th Jan.: Major earthquake in Tari region at 10 pm, epicentre at Bosavi (7.5 on Richter scale)</td>
</tr>
<tr>
<td>1925</td>
<td>?Very severe drought, known to Huli as &quot;Ambuamo&quot;; major food shortage, with heavy mortality</td>
</tr>
<tr>
<td>1934</td>
<td>Sept.-Dec.: Minor drought</td>
</tr>
<tr>
<td>1935</td>
<td>Severe wet period and ensuing famine concluding in February 1936 [Glasse (in press) probably wrongly attributes this event to 1936]</td>
</tr>
<tr>
<td>1938</td>
<td>Heavy rains for 6 to 8 months, moderate food shortages</td>
</tr>
<tr>
<td>1941</td>
<td>?Severe drought with frosts and bushfires; Tagali river dries up completely; subsequent major food shortage extending into 1942, with heavy mortality</td>
</tr>
<tr>
<td>1943</td>
<td>Heavy rains in early 1943; Start of major porcine anthrax epidemic</td>
</tr>
</tbody>
</table>
| 1945 | ?Heavy rains for 4 to 5 months; moderate food shortage
?Influenza, dysentery (ti darama) epidemics |
| 1954 | Anthrax epidemic
3rd Mar.: Major earthquake near Tari, VII on Modified Mercalli scale of felt earthquakes, some fatalities
4th Mar.: Major earthquake near Tari, VI on Modified Mercalli scale of felt earthquakes
Sept.-Oct.: Minor food shortage |
| 1955 | Oct.-Nov.: Food in abundance
Nov.: Major earthquake at Tari, 6 on Richter scale |
| 1956 | May: Minor food shortage, Haepugua
Aug./Sept.: Tagali river in flood |
| 1957 | Minor food shortage in Koroba area after heavy rains |
| 1958 | Anthrax epidemic |
| 1959 | Pneumonia epidemic at Margarima |
| 1960 | June?: Bushfires at Paijaka
5th Aug.: Full eclipse of the moon noted at Tari
Heavy rains, minor food shortage |
| 1961 | Heavy rains, minor food shortages
Sept.: Minor frosts at Tari |
1962
Jan.: Influenza epidemic
4th Feb.: Full eclipse of the sun noted at Tari
June: Measles epidemic
Nov.: Minor food shortage

1964
24th Apr.: Major earthquake near Tari, V-VI on Modified Mercalli scale of felt earthquakes
Apr.-May: Dysentery epidemic

1965
Drought; minor food shortages, followed by good karuka pandanus harvest

1972
Severe frost and drought; minor food shortages

1982
July-Nov.: Severe frost and drought; minor food shortages

1984
1st June: Excessive rain; minor food shortages
Flooding in Koroba

1985
17th May: Debi river in flood

1986
28th Oct.: Tagali river in flood

1989
Sept.: Hail storm in Pi-Nagia area destroys crops; minor local food shortage

1990
26th Apr.: Flooding throughout Tari region

1991
4th Mar.: Debi river in flood
June-August: Heavy rains, flooding at Dalipugua and Haepugua
15th Aug.: Flood covers Haepugua completely

1993
25th Feb.: Heavy rains, floods cover Haepugua completely
July: Major landslide in Puyaro area destroys settlements; no casualties reported
20th Aug.: Major earthquake shock received at 3.05 pm at Tari; District Office breaks in two, no fatalities.

Sources:
Allen et al. 1989; Ballard field and interview notes; Dent 1974; Glasse in press;
Leahy 1943; South Pacific Post, 19/9/61; Tari Patrol Reports: 3-54/55:2; 4-54/55:2;
6-55/56:2; 1-57/58; 1-58/59:15; 1-59/60:9; 6-60/61:6; 8-60/61.
<table>
<thead>
<tr>
<th>Substance</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td><em>iba</em></td>
<td>water</td>
</tr>
<tr>
<td><em>ibane</em></td>
<td>grease, fat, sap, juice</td>
</tr>
<tr>
<td><em>andu ibane</em></td>
<td>breastmilk</td>
</tr>
<tr>
<td><em>wi ibane</em></td>
<td>semen</td>
</tr>
<tr>
<td><em>dindi ibane</em></td>
<td>soil &quot;grease&quot;</td>
</tr>
<tr>
<td><em>ira ibane</em></td>
<td>tree sap</td>
</tr>
<tr>
<td><em>habane/habahe</em></td>
<td>human fat/grease</td>
</tr>
<tr>
<td><em>nogo habane</em></td>
<td>pig fat/grease</td>
</tr>
<tr>
<td><em>darama</em></td>
<td>blood (also <em>yada</em> - Goldman 1981a:50)</td>
</tr>
<tr>
<td><em>pugua</em></td>
<td>menstrual blood</td>
</tr>
<tr>
<td><em>kuyanda</em></td>
<td>infected, &quot;bad&quot; blood</td>
</tr>
<tr>
<td><em>angibu</em></td>
<td>pus</td>
</tr>
<tr>
<td><em>hugu</em></td>
<td>vaginal secretion</td>
</tr>
<tr>
<td><em>pipini</em></td>
<td>corpse fluids (also &quot;bad&quot; breastmilk - Goldman 1983:94)</td>
</tr>
<tr>
<td><em>gabuni</em></td>
<td>dryness, menopausal woman</td>
</tr>
<tr>
<td><em>dindi gabu</em></td>
<td>dry, infertile soil</td>
</tr>
<tr>
<td><em>ira gabu</em></td>
<td>dry, dead wood</td>
</tr>
<tr>
<td>PHASE</td>
<td>APPROX. DATES (years B.P.)</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>9000-5000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5000-300</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>300-30</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>30-present</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE C2

CHANGES IN THE AREA OF UNRECLAIMED WETLAND AT HAEAPUGUA, 1959 - 1992

<table>
<thead>
<tr>
<th>Year</th>
<th>Unreclaimed wetland (km²)</th>
<th>Inter-coverage period (years)</th>
<th>Inter-coverage change (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959</td>
<td>8.3139</td>
<td></td>
<td>na</td>
</tr>
<tr>
<td>1972</td>
<td>3.6619&lt;sup&gt;a&lt;/sup&gt;</td>
<td>13</td>
<td>na</td>
</tr>
<tr>
<td>1978</td>
<td>7.1114</td>
<td>6 (19)</td>
<td>- 1.2025 (85.5%) (1959-78)</td>
</tr>
<tr>
<td>1989</td>
<td>7.0788&lt;sup&gt;a&lt;/sup&gt;</td>
<td>11</td>
<td>na</td>
</tr>
<tr>
<td>1992</td>
<td>7.6054</td>
<td>3 (14)</td>
<td>+ 0.494 (106.9%) (1978-92)</td>
</tr>
</tbody>
</table>

Maximum and minimum areas of unreclaimed wetland, 1959 - 1992 (km²):

Maximum: 9.3548
Minimum: 5.3330
Max./Min. differential: 4.0218

<sup>a</sup> = only partial coverage of map study area
<table>
<thead>
<tr>
<th>Clan</th>
<th>Wetland area (km²) (^b)</th>
<th>Percentage of total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wenani</td>
<td>0.683</td>
<td>7.4</td>
</tr>
<tr>
<td>Munima</td>
<td>0.326</td>
<td>3.6</td>
</tr>
<tr>
<td>Walete(^a) (Tani)</td>
<td>1.931</td>
<td>21.1</td>
</tr>
<tr>
<td>Dobani</td>
<td>0.858</td>
<td>9.4</td>
</tr>
<tr>
<td>Taibaanda(^a) (Tani)</td>
<td>3.254</td>
<td>35.5</td>
</tr>
<tr>
<td>Yumu</td>
<td>0.075</td>
<td>0.8</td>
</tr>
<tr>
<td>Hiwa(^a)</td>
<td>0.102</td>
<td>1.1</td>
</tr>
<tr>
<td>Dumbiali(^a) (Tani)</td>
<td>0.412</td>
<td>4.5</td>
</tr>
<tr>
<td>Telabo(^a)</td>
<td>1.528</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>9.172</strong></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

\(^a\) - Yari phratry class
\(^b\) - calculated using figures for the maximum extent of the map study area wetlands between 1959 and 1992.
### TABLE C4

**HULI TERMS FOR STONE AXE BLADES**

<table>
<thead>
<tr>
<th>Term:</th>
<th>Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>abina</td>
<td>Traded from <em>obena</em> (Ipili/Enga). Possibly a generic label for blades from the Jimi Valley sources, where one of the quarries is called Apin (Burton 1984:179). A similar term, <em>apina</em>, is used by Enga trade sources and is presumably the immediate origin of the Huli term.</td>
</tr>
<tr>
<td>dongoma</td>
<td>Traded from <em>obena</em> (Ipili/Enga). Literally 'light-coloured'.</td>
</tr>
<tr>
<td>gundina</td>
<td>Traded from <em>obena</em> (Ipili/Enga). Reflects the use by Enga trade sources of the term <em>kundina</em>, which Burton (1984:221) suggests is a possible corruption of the name of the major Tuman River quarry at Kunjin and which may correspond to blades from that source.</td>
</tr>
<tr>
<td>mugalo</td>
<td>Traded from <em>obena</em> (Ipili/Enga). Refers to Mt. Mugalo, on the upper Lagaipa river, a prominent feature along the major trade route from central Enga to the Huli.</td>
</tr>
<tr>
<td>pongorali</td>
<td>Traded from <em>obena</em> (Ipili/Enga). Probably a corruption of the name of the locale, Porgera, through which these blades reached Huli.</td>
</tr>
<tr>
<td>warabia</td>
<td>Traded from <em>duna</em> (Lake Kopiago: Duna-speakers). Possibly a corruption of the name of the closest western source, the Wario river, which has been identified as the source of at least some lenticular warabia blades acquired from Huli (Swadling 1983:82).</td>
</tr>
<tr>
<td>dindi ayu</td>
<td>Literally 'earth axe'. Refers to blades manufactured by Huli from local stone, but also (confusingly) to blades from any other source found buried in the soil and reworked.</td>
</tr>
<tr>
<td>tamabu</td>
<td>Traded from <em>hewa</em> (Lake Kutubu: Fasu- and Foi-speakers).</td>
</tr>
<tr>
<td>batagua</td>
<td>Large ceremonial axe blades from the Jimi and Tuman quarries traded to Huli briefly and in very small numbers only after contact.</td>
</tr>
</tbody>
</table>

**Note:**

Glasse (1968/69) recorded two additional Huli terms for axe blades, *komoga* and *kombi*, but I have been unable to find anyone who could confirm or elaborate upon either term.
### TABLE C5

**AN INVENTORY OF TYPES OF HULI RITUAL STONE (LIRU)**

Stones employed in Huli rituals are sometimes referred to under the generic label of *liru*, after the most common form of ritual stone, though specific terms are more usually used. Another generic term for ritual stones, which appears to be Duna in origin as it has no specific referent amongst Huli, is *auwi*. Of the specific categories listed below, all except *guru wali* have been indentified with the aid of examples of the stones in question. The description of *guru wali* stones draws on three independent accounts which are all in close accord with one another.

<table>
<thead>
<tr>
<th>Huli term:</th>
<th>Comment and description:</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>barinumbi</em></td>
<td>circular stone club heads with drilled central holes, employed in the yabo ritual.</td>
</tr>
<tr>
<td><em>erepole</em></td>
<td>&quot;broken-back&quot;: corrugated crescent-shaped fossils, generally dark in colour. Of two specimens examined, one was identified as an ammonite, the other as an <em>Inoceramus</em> mussel (J.Chappell pers.comm.).</td>
</tr>
<tr>
<td><em>guru wali</em></td>
<td>&quot;guru-woman&quot; (male <em>dama</em> spirit): cylindrical stones with appendages held to be &quot;arms&quot;, sometimes sufficient in number to include &quot;legs&quot;.</td>
</tr>
<tr>
<td><em>hone</em></td>
<td>&quot;light-coloured&quot;: tan- or light-coloured cylindrical stones, varying in cross-section from oval to circular (cf <em>ni hone</em>, <em>wanelabo keba</em>).</td>
</tr>
<tr>
<td><em>igiri labo</em></td>
<td>&quot;boy-water spirit&quot;: stone pestles of all shapes and sizes.</td>
</tr>
<tr>
<td><em>liru</em> / <em>liru kui</em></td>
<td>&quot;<em>liru</em>-bone/real&quot;: a broad category referring to rough-surfaced spherical or slightly elongated stones.</td>
</tr>
<tr>
<td><em>nanabe</em></td>
<td>a general category employed for most carved stone figures, including anthropomorphs, birds, etc..</td>
</tr>
<tr>
<td><em>ni tangi</em></td>
<td>&quot;sun-hat&quot;: stone mortars of all shapes and sizes.</td>
</tr>
<tr>
<td><em>ni habane</em></td>
<td>&quot;sun-egg&quot;: smooth, black spherical stones, commonly 8-12 cm in diameter, employed in <em>toro</em> sorcery. Two examples have been identified as chert cobbles (J.Chappell pers.comm.).</td>
</tr>
<tr>
<td><em>ni hone</em></td>
<td>see <em>hone</em>.</td>
</tr>
<tr>
<td><em>wane labo / wane labo keba</em></td>
<td>&quot;female water spirit-digging stick&quot;: cylindrical stones, similar in form to <em>hone</em> though usually &quot;flatter&quot; in section, and generally light green in colour.</td>
</tr>
<tr>
<td><em>wane labo undu</em></td>
<td>&quot;female water spirit-breast&quot;: thin black glassy stones.</td>
</tr>
</tbody>
</table>
### TABLE C6

**WALOANDA SURFACE SURVEY COLLECTION**

<table>
<thead>
<tr>
<th>Block</th>
<th>Area (m²)</th>
<th>%E</th>
<th>BD</th>
<th>Artefacts</th>
<th>AN</th>
<th>MN</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12425</td>
<td>30</td>
<td>D</td>
<td>13</td>
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<td>10+</td>
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<tr>
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<tr>
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<td>5286</td>
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<td>6147</td>
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<td>9</td>
<td>15</td>
<td>2.8</td>
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</table>

[Column notes on next page]
**Column Notes, Table C6**

%E - percentage of block surface area exposed
BD - impressions of background density of non-artefactual stone material in exposed surface: DD (very dense), D (dense), M (medium density), L (low density), LL (very low density)

**Artefacts:**
- Fl - Stone flakes
- A/AF - Axes/Axe fragments
- *Liru* - Ritual stones (mortars, pestles, stone carvings, *liru kui*)
- CS - cooking stones
- O - ochre stubs
- TB - tanged blade

**AN** - Artefact numbers (total number of artefacts, excluding cooking stones)
**MN** - Modified number (AN/%E x 100)
**AD** - Artefact density (predicted surface density of artefacts per 1000 m²; AD = MN/Area x 1000)
TABLE C7

LAYER DESCRIPTIONS FOR THE BASAL WHITE CLAY UNIT AT HAEAPUGUA

This composite description of the stratigraphy of the basal "white clay" unit at Haepugua draws primarily on descriptions from the LOB site, but also incorporates observations made at the LOC and LOD sites (Appendix C10). The sequence is described from the known base, layer 1, up to the highest layer located in association with other identifiable components of the sequence.

<table>
<thead>
<tr>
<th>Layer</th>
<th>Shell</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Olive (5Y/5/3) silty clay, weak pedality, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Dense black (5Y/2.5/1) silty loam, crumbly, weak pedality, slightly sticky, with massive woody content.</td>
</tr>
<tr>
<td>3a</td>
<td>x</td>
<td>Olive (5Y/5/3) silty clay, weak pedality, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>3b</td>
<td>x</td>
<td>Thin (0.1 - 0.2 cm) shell band.</td>
</tr>
<tr>
<td>3c</td>
<td>x</td>
<td>Very dark greyish brown (2.5Y/3/2) light sandy clay loam, brittle/crumbly, apedal, slightly sticky.</td>
</tr>
<tr>
<td>3d</td>
<td>x</td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>4</td>
<td>x</td>
<td>Very dark greyish brown (2.5Y/3/2) light sandy clay loam, brittle/crumbly, apedal, slightly sticky.</td>
</tr>
<tr>
<td>5</td>
<td>x</td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky.</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Black (2.5Y/N2) silty loam, crumbly, weak pedality, slightly sticky, massive wood content increasing in size towards the top of the layer where the top 10 cm is solid wood, capped by a thin 1 cm band of carbonised organic material. Also contains small fragments of limestone (&lt;5%).</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Dark olive grey (5Y/3/2) fine sandy tephra, brittle, non-sticky, moderate pedality.</td>
</tr>
<tr>
<td>8a</td>
<td>x</td>
<td>Very dark greyish brown (2.5Y/3/2) light sandy clay loam, brittle/crumbly, apedal, slightly sticky.</td>
</tr>
<tr>
<td>8b</td>
<td>x</td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Dark olive grey (5Y/3/2) fine sandy tephra, brittle, non-sticky, moderate pedality.</td>
</tr>
<tr>
<td>10</td>
<td>x</td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>Layer</td>
<td>Shell</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Dark olive grey (5Y/3/2) fine sandy tephra, brittle, non-sticky, moderate to high pedality.</td>
</tr>
<tr>
<td>12a</td>
<td>X</td>
<td>Very dark greyish brown (2.5Y/3/2) light sandy clay loam, brittle/crumbly, apedal, slightly sticky.</td>
</tr>
<tr>
<td>12b</td>
<td>X</td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Dark olive grey (5Y/3/2) fine sandy tephra, brittle, non-sticky, moderate to high pedality.</td>
</tr>
<tr>
<td>14</td>
<td>X</td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky, faint internal organic banding.</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>Very dark grey (5Y/3/1) fine sandy tephra, brittle, non-sticky, strong pedality above water table, &quot;cemented&quot; below water table.</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Olive (5Y/5/3) light clay, apedal, slightly sticky, faint internal organic banding.</td>
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</table>

x = freshwater shell fragments present
### TABLE C8

**DIMENSIONS OF HOLE FEATURES FILLED WITH DARK GREY CLAY, DOBANI / WALOANDA AREA EXCAVATIONS**

<table>
<thead>
<tr>
<th>Site</th>
<th>Feature</th>
<th>Max.width (cm)</th>
<th>Max.depth (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOB(ii)</td>
<td>E</td>
<td>6 x 15</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>5 x 5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>9 x 10</td>
<td>8</td>
</tr>
<tr>
<td>LOC</td>
<td>C</td>
<td>13 x 13</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>11 x 13</td>
<td>27</td>
</tr>
<tr>
<td>LOI</td>
<td>A</td>
<td>9 x 12</td>
<td>6</td>
</tr>
<tr>
<td>LOJ</td>
<td>C</td>
<td>4 x 6</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>5 x 7</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>20 x 25</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>6 x 10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>8 x 8</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>8 x 10</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>I</td>
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<td>Site/sample</td>
<td>ANU code</td>
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<tr>
<td>-------</td>
<td>----------------------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>2C</td>
<td>560 (310) m</td>
<td>LOQ/c</td>
<td>8809</td>
</tr>
<tr>
<td></td>
<td>770 (490) m</td>
<td>LOU(i)/b</td>
<td>8310</td>
</tr>
<tr>
<td></td>
<td>660 (490) 240</td>
<td>LOU(ii)/b</td>
<td>8757</td>
</tr>
<tr>
<td></td>
<td>690 (500) 50</td>
<td>LOJ/d</td>
<td>8754</td>
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<tr>
<td></td>
<td>670 (540) 430</td>
<td>LOC/a</td>
<td>7808</td>
</tr>
<tr>
<td></td>
<td>780 (630/610/560) 420</td>
<td>LOL/3a</td>
<td>8307</td>
</tr>
<tr>
<td>2B</td>
<td>1280 (1130/1110/1090) 960</td>
<td>LOJ/e</td>
<td>8755</td>
</tr>
<tr>
<td></td>
<td>1710 (1130/1110/1090) 630</td>
<td>LOJ/f</td>
<td>8756</td>
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<tr>
<td></td>
<td>1420 (1160) 770</td>
<td>LOQ/b</td>
<td>8808</td>
</tr>
<tr>
<td></td>
<td>1280 (1170) 1060</td>
<td>LOF/a</td>
<td>7624</td>
</tr>
<tr>
<td></td>
<td>1420 (1300) 1160</td>
<td>LOE/a</td>
<td>7625</td>
</tr>
<tr>
<td>2A</td>
<td>2500 (1990) 1520</td>
<td>LOI/a</td>
<td>7806</td>
</tr>
<tr>
<td></td>
<td>2940 (2350) 1880</td>
<td>LOJ/a</td>
<td>7800</td>
</tr>
<tr>
<td>1C</td>
<td>9400 (9260) 9140</td>
<td>LOO/a</td>
<td>8758</td>
</tr>
<tr>
<td>1B</td>
<td>14,250 (12,900) 10,980</td>
<td>LOA/c</td>
<td>7623</td>
</tr>
<tr>
<td>1A</td>
<td>18,840 (18,130) 17,340</td>
<td>LOC/b</td>
<td>7809</td>
</tr>
<tr>
<td></td>
<td>19,040 (18,710) 18,400</td>
<td>LOJ/b</td>
<td>7801</td>
</tr>
<tr>
<td></td>
<td>21,550 (21,040) 20,490</td>
<td>LOJ/c</td>
<td>7802</td>
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**TABLE C10**

ARCHAEOLOGICAL PHASES AND PALAEOENVIRONMENTAL ZONES IN THE TARI REGION

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<thead>
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<th>Age BP</th>
<th>Archaeological Phases</th>
<th>Palaeoenvironmental Zones</th>
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<tbody>
<tr>
<td>&gt;36 000</td>
<td>x</td>
<td>Ia</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>33 000</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>21 000</td>
<td></td>
<td>Ib</td>
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<tr>
<td>18 000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>13 000</td>
<td>1B</td>
<td>II</td>
</tr>
<tr>
<td>9500</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>8500</td>
<td></td>
<td>IIIa</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
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<td>3200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td></td>
<td>IIIb</td>
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<td>1300</td>
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<tr>
<td>1000</td>
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<td>IVa</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td></td>
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<tr>
<td>200</td>
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</tr>
<tr>
<td>0</td>
<td>3</td>
<td>IVb</td>
</tr>
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</table>

x = no archaeological evidence
<table>
<thead>
<tr>
<th>Swamp</th>
<th>Elevation (m)</th>
<th>Swamp area (km²) [S]</th>
<th>Catchment area (km²) [C]</th>
<th>S/C Ratio [S/C]</th>
<th>C/S Ratio [C/S]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lebani</td>
<td>2250</td>
<td>7.77</td>
<td>143.83</td>
<td>0.054</td>
<td>18.5</td>
</tr>
<tr>
<td>Mogoropugua</td>
<td>1870</td>
<td>7.60</td>
<td>63.58</td>
<td>0.119</td>
<td>8.4</td>
</tr>
<tr>
<td>North</td>
<td>1870</td>
<td>4.11</td>
<td>24.28</td>
<td>0.169</td>
<td>5.9</td>
</tr>
<tr>
<td>South</td>
<td>1870</td>
<td>2.87</td>
<td>38.69</td>
<td>0.074</td>
<td>13.5</td>
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<tr>
<td>Wabupugua (Yaluba)</td>
<td>1790</td>
<td>1.32</td>
<td>63.91</td>
<td>0.021</td>
<td>48.5</td>
</tr>
<tr>
<td>Dalipugua (Koroba)</td>
<td>1705</td>
<td>6.97</td>
<td>231.44</td>
<td>0.030</td>
<td>33.2</td>
</tr>
<tr>
<td>Haeperugua</td>
<td>1650</td>
<td>17.10</td>
<td>1075.99</td>
<td>0.016</td>
<td>62.9</td>
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<tr>
<td>Urupupugua (Tari basin)</td>
<td>1610</td>
<td>3.32</td>
<td>5.11</td>
<td>0.650</td>
<td>1.5</td>
</tr>
<tr>
<td>Appendix A1</td>
<td>The Ipomoean Revolution debate</td>
<td>1-20</td>
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<td>Appendix A2</td>
<td>A chronological bibliography of Golson's writings on Kuk</td>
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<td>Dating the Tibeito and Ōlgaboli ash falls</td>
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<td>A history of contact and list of notable events for the Tari region</td>
<td>1-6</td>
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<td>A note on Huli orthography and glossary of Huli terms used in this thesis</td>
<td>1-5</td>
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<td>Appendix B3</td>
<td>Huli terms for grasses, sedges, mosses, ferns and shrubs</td>
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<td>Huli terms for trees</td>
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<td>Details of Huli sacred geography</td>
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<td>CROP species and cultivars of the Tari region</td>
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<td>Fauna of the Tari region</td>
<td>1-4</td>
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<td>Birds of the Tari region</td>
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<td>Aerial photographic coverage of the Tari region</td>
<td>1-4</td>
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<td>Appendix C2</td>
<td>A summary of clan origin (dindi malu) narratives for some of the Haeapugua clans</td>
<td>1-4</td>
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<td>Wetland garden case histories</td>
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<td>A survey of archaeology in the Tari region</td>
<td>1-5</td>
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<td>A register of archaeological sites of the Tari, Lake Kopiago and Porgera regions of Southern Highlands and Enga Provinces</td>
<td>1-9</td>
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<td>Artefacts collected during 1988-1992 from archaeological sites of the Tari region, Southern Highlands Province</td>
<td>1-3</td>
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<td>Archaeological site descriptions</td>
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<td>Radiocarbon results from the Tari and Lake Kopiago regions</td>
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APPENDIX A1

THE IPOMOEAN REVOLUTION DEBATE

1. Introduction

This appendix sets out some of the details of the Ipomoean revolution debate; the significance of this debate for my thesis is described in Chapter A2. A review of Watson's initial formulation of an Ipomoean revolution and the subsequent criticism this attracted is followed by a double movement, from the early archaeological results in the Wahgi valley, to anthropological models developed from those results, and back to the re-interpretation of the archaeology. A concluding section offers a broad critique of the ahistorical character of the debate taken as a whole.


As a member of the first "wave" of anthropologists to work in the Papua New Guinea Highlands (Hays 1992), the period of Watson's fieldwork in the Kainantu area of the Eastern Highlands (Figure A2), starting in 1953, furnished him with a sense of the changes that had accompanied administrative contact (Watson 1983:327), a perspective not afforded to many later ethnographers of the Central Highlands valleys. This sense, in turn, prompted him to consider the scope for change in pre-contact society and to propose, in a series of papers (1964, 1965a, 1965b, 1967), that the Highlands which ethnographers have been examining for about three decades do not, in many fundamental respects, represent a long-established or stable situation, socially or culturally (1965b:442).

At the core of this assertion lay Watson's observation that the sweet potato, the staple crop throughout much of the Highlands region, appeared to be a recent introduction; in the only archaeological writing on the Highlands then available to Watson, Susan and Ralph Bulmer had speculated that none of the staple crops available prior to sweet potato - taro, kudzu (*Pueraria lobata*), banana or yam - could have maintained the population densities then sustained by sweet potato (S. and R. Bulmer 1964:47). The Bulmers' three-stage system for the historical development of Highlands societies drew on their recently published radiocarbon date of 10,350 ± 140 BP (Y-1366) from the rock-shelter site of Kiowa (S.Bulmer 1964). An initial period of Highlands occupation, Phase I, was characterised as a 'pre-neolithic' hunting and gathering economy (S. and R. Bulmer 1964:72-74). Phase II, heralded by the appearance of lenticular-sectioned axe-adzes, saw the development of agriculture based on taro, banana, yam, *Pueraria lobata*, and sugar cane, and Phase III the introduction of intensive sweet potato cultivation. This introduction, they suggested, must have been followed by 'economic and social revolutions' (ibid:52) and 'major redistributions of population' (ibid:47). Watson's contribution was to pursue the likely consequences of this introduction.

Watson's evidence for the recency of sweet potato was largely synchronic, reflecting his belief that local history was inscribed upon the present. Unlike the presumed pre-Ipomoean staples, sweet potato had almost no ritual significance in the region; the Hulli were said to distinguish in their genealogies between "men of taro" and "men of sweet potato"; even those groups, such as the Agarabi and Tairora of the Eastern Highlands with whom Watson worked, who maintained that they had "always" had sweet potato, identified external origins for all known cultivars of the crop; finally, the 'incomplete' adoption of sweet potato within the region suggested that the crop had been available to groups such as the Telefolmin, who were still committed to other staples, for only a short period of time. A comparison of the relative antiquity ascribed by Highlanders to other New World crops such as tobacco, maize and cassava allowed Watson to speculate on variation in the rate of acceptance and incorporation of the different crops. Noting that the tuberous *Pueraria lobata* was identified in some communities as a functional equivalent for sweet potato, Watson then raised the
possibility that this little-known tuber might have served as the pre-Ipomoean staple (1964).

Defining as "Ipomoean" that which has developed with the adoption of the sweet potato... or which is attributable to it' (1965b:443), Watson proposed that 'the Central Highlands of New Guinea have been remade within the last three centuries through the introduction of... sweet potatoes, which, under the prevailing conditions, proved to be an innovation of radical possibilities' (1965a:307). He proceeded to outline some of these possible changes in five fields: subsistence, demography, social structure, warfare and work patterns. Changes in subsistence, other than the obvious switch from existing staples to sweet potato, may have included the development of new technologies: complete soil tillage, fencing and tree-fallowing. More significant was 'the possibility that swine-keeping either developed or achieved its present importance largely thanks to the new horticulture' (1965b:444). Demographic change may have taken the form of a population explosion, and the adjustments required of groups adapting to restricted territories and increased numbers could perhaps explain the 'development of unilinearity' in Highlands social structure and the origins of warfare on the scale known from early accounts of contact. In an aside, Watson suggested that the common identification of the pre-Ipomoean staples as 'male' and sweet potato as a "female" crop might reflect changes in the sexual division of labour, from a male labour-intensive economy prior to the adoption of sweet potato, to a sweet potato economy that required higher commitments of female labour.

More interesting, perhaps, than Watson's specific vision of historical change, was his general model of the dynamics of a crop revolution. The advantages of sweet potato now apparent to Highlanders or agronomists would not have been self-evident to people already committed to other staples and other economies. Existing traditions might well have served as a 'brake' on the shift to sweet potato (1965b:449), and Watson pointed to the Telefolmin and Ok Sibil groups as examples of "taro areas" in which the sweet potato had not emerged as the dominant staple. But if 'the taste of a strange root... alone [were not] enough to recommend it' (1965b:442), the advantages of sweet potato as pig fodder, and the "Jones effect" (ibid:442), the need to keep up with neighbours benefiting from such a productive advantage, would have served equally as incentives to experiment with the innovation. The probable success of initial experiments with sweet potato as pig fodder might then have 'accentuated a commitment to the new crop, giving a kind of ecological feedback' (1965b:444). Local differences in pre-Ipomoean economies and cultural preferences were thus reflected in variation in the extent and recency of adoption of sweet potato. Significantly for the argument about agency in my thesis, he matched the persistence of some inter-regional pre-Ipomoean cultural differences against the tendency of sweet potato adoption to eclipse other forms of variation (1965b:449).

Aware of the complexities and the scope for variation that he had already canvassed, Watson drew on these insights to propose four different models for the impact of the introduction of sweet potato (1965a:302-303):

1) The "explosive" model in which pre-Ipomoean economies founded on hunting and gathering with 'supplementary' horticulture were radically transformed by the introduction both of sweet potato and intensive horticultural techniques.

2) The "gradual" model in which an established pre-Ipomoean system of horticulture supplied up to half of food requirements. Sweet potato subsequently displaced existing staples and allowed for expansion into new areas, effecting a minor revolution with agriculture providing up to 90% of subsistence needs.

3) A combination of the gradual and explosive models reflecting regional variation in pre-Ipomoean economies.
4) A 'slow and gradual transition to dependence upon the sweet potato [as] a logical fourth possibility', which envisaged pre-Ipomoean populations 'already dense, preponderantly horticultural and sedentary'.

With little but the marginal evidence of rock-shelter excavations available to him, Watson declared his preference for the first model, the most radical of the available choices: that 'the Central Highlands were occupied by scattered bands of hunters practising supplementary cultivation until the introduction of sweet potato' (1965a:301). As Feil (1987:29) has suggested, Watson's preference reflected his understanding of the conditions in the Kainantu region with which he was most familiar. Nevertheless, it was a choice that led him then to the difficult position of having to propose annual rates of population increase of up to 1.5% to account for the transition from hunter-gatherer bands to the dense ethnographic population of the 1960s in only 300 years (1965a:302).

The lasting value of Watson's contribution to the debate rests not on his specific vision of the past but in the method of his approach, which he described as 'ethnological reconstruction' or 'conjectural history' (1965b:442). Throughout, his writing maintained a sense of the range of possible historical action and decision, often qualifying (to the point of contradicting) his own proposals: sweet potato, while revolutionary in its implications, may have served 'as an accelerating and consolidating factor, probably not as the one which initiated horticulture' (ibid:441); he 'hesitated to conclude that complete tillage arose only after the adoption of sweet potatoes' (1967:95); and his concern with the 'gradualist' view of change was 'not to attempt to dispose' of it (ibid:92), but rather to explore its implications.

Watson's emphasis on the range of influences brought to bear on the decisions of historical actors was crucial: 'We need a notion of this revolution... that does not neglect the sociological factors in favour of the purely technological ones or in favour of the simple concept of a more efficient commissariat rationally chosen by men afforded the choice' (1965b:442). In placing human society in the Highlands at the centre of his conception of history, Watson was also adamant that those societies had to be viewed historically: '[t]hat major ecological and demographic changes may have occurred in the Highlands in recent times is obviously not a possibility to which the social or cultural anthropologist can be comfortably indifferent, any more than the geographer or prehistorian' (1967:98).

3. The Canberra Seminar, 1967

The discovery in March 1966 of wooden artefacts in the swamp at the Manton site in the Wahgi Valley (Figure A2) led to the excavation there of buried drainage systems during June and July of the same year. Shortly after, a wooden digging stick from the site yielded a radiocarbon result of 2300 ± 120 BP (ANU-44) (Golson et al. 1967, Lampert 1967). In the absence of Jack Golson, a principal member of the archaeological team at the Manton site, a three-day seminar was convened in Canberra in April 1967 by Peter White and Harold Brookfield in order to reconsider Watson's proposed Ipomoean Revolution in light of the new finds. Papers were given at the Canberra seminar by an archaeologist (White), anthropologists (Chowning and Dornstreich), a linguist (Wurm), geographers (Brookfield and Waddell), palynologists (Wheeler - later Powell, and Flenley), and a demographer (Van de Kaa). Handwritten

1. Throughout, Watson's calculations of the dates of population growth or sweet potato adoption were hampered by his belief that the volcanic 'time of darkness', identified as a critical temporal marker in oral historical traditions across the Highlands, referred to the eruption of Krakatoa in 1883 (1963). Blong (1982) has since argued that this event represented not Krakatoa but a tephra fall from an eruption at Long Island dated to between 1640 AD and 1680 AD; further discussion of the dating of this event is contained in Appendix A3. Parts B and C of this thesis deal extensively with the effects of the Long Island eruption in the Tari region.
or typed summaries and transcripts of the papers by Wheeler (1967), Dornstreich (1966) and White (1967a) give some idea of the general tenor of the seminar, described by its convenors in their published summary of proceedings as 'critical of Watson's argument and assumptions' (Brookfield and White 1968:44).

The summary by Brookfield and White ignored many of Watson's own qualifications and represented his 'hypothesis' as a single, unitary construct, derived from his preference for the most radical of the proposed models, a misrepresentation that has subsequently become entrenched in the literature (eg Lampert 1967:308, Powell et al 1975; Golson 1976d:205 is perhaps the exception that proves the rule). While Watson would have done 'better to await the diachronic evidence now beginning to emerge' (Brookfield and White 1968), his use of the synchronic evidence was itself challenged. His characterisation of Highlands societies was questioned, as were his models of population growth and his vision of pre-Ipomoea 'patrilocal' bands.

But, continued Brookfield and White, 'the most telling single piece of evidence against any hypothesis of an "Ipomoean revolution" in cultivation methods' (1968:47, my emphasis) was deemed to be the archaeological discovery of the Wahgi drainage systems. [N]o major technological revolution... was required to permit the adoption of sweet potato' (1968:49, my emphasis), and the authors felt that a position had been reached 'in which the introduction of the sweet potato might cease to be of major relevance to the development of agricultural methods in the New Guinea Highlands' (1968:50, my emphasis). This association of revolution with radical technological change appears to have missed completely the focus of Watson's proposals, which took broader social change as the measure of revolution.

The substitution of an emphasis on technological change for Watson's social changes then allowed Brookfield and White to dismiss his other proposals: they found it 'extraordinary tha: Watson should suggest a necessary association between pigs and sweet potato, for pigs are omnivorous' (1968:47), and countered with

a very simple hypothesis... Sweet potatoes may simply have become dominant in those areas where they offered a notably higher return for comparable inputs of land and labor - a pragmatic hypothesis which accords with what we know of New Guinea farmers and has minimal need of Watson's differentially operating "Jones effect"

Brookfield and White 1968:49

Watson's papers, including his plea for an emphasis on the sociology of agricultural change, could now be dismissed with a reference to their refutation by the archaeological evidence from the Wahgi Valley (Yen 1974:318, Golson 1976d:206).

The Canberra seminar was to have a lasting effect on the course of archaeological research in the Papua New Guinea Highlands; some of the more significant legacies are considered here. The first of these was the belief in the primacy of the archaeological record over 'the perilous quagmire of conjecture' (Brookfield and White 1968:51).

2. Criticism of Watson at the Canberra seminar and in the summary by Brookfield and White was perhaps exacerbated by the rather hasty and inelegant application of his model by Heider (1967).
3. A clearer definition of what the Canberra seminar may have perceived as the requirement of a revolution emerges from White's later writing: 'a fairly swift economic change associated with the arrival of some new artifacts, something which one could call a "neolithic revolution"' (1972:148).
4. The use of the term "farmer" is itself revealing, imparting a universal individualism to agricultural practice which implies that "farmers" in New Guinea behave independently and make "rational" decisions in much the same way as "farmers" elsewhere. It also neatly divorces "farming" decisions from other cultural contexts.
5. Curiously, within the same sentence, Brookfield and White cited the 'speculations' of the Bulmers (in a paper the Bulmers themselves introduce as 'avowedly speculative' (S. and R. Bulmer 1964)) as support for their own model.
This position, apparently untroubled by questions of interpretation, both obscured the role of conjecture in all archaeological reconstruction and effectively severed dialogue between archaeologists and anthropologists for the next decade. The preference for 'evolution' rather than 'revolution' in explaining 'agricultural transformations' reflected Brookfield's earlier 'working hypothesis' (conjecture?) 'that the highland concentrations are of very long standing, and that they have long depended on tuber cultivation... locally modified to suit local conditions over a long period of time' (1961:444). This gradualist assertion has, over time, assumed the status of a creed:

> the complexity of contemporary Highlands societies has its roots not in single events, such as the introduction of sweet potato or pigs, but rather as a natural outcome of uninterrupted processes which have lasted for more than 9000 years

Gorecki 1986:165^6

Closely related to this preference for "evolutionary" explanation was the focus proposed by Brookfield and White on ecology, technology and population as the principal variables in history:

> No Ipomoean revolution is necessary to explain the evolution of intensive methods of agriculture, and the question is thus turned back properly to that of population concentration.

Brookfield and White 1968:50^7

Human agency, in this view, operated through the medium of population growth and technological innovation in reaction to ecological change, and the section that follows illustrates the application of such theory to the archaeological site at Kuk. For archaeologists, the principal response to this initial exchange between archaeology and anthropology was to take their cue from the work of ecologically oriented geographers working in the Highlands region (Clarke 1966, Waddell 1972a,b).


After the discovery and initial excavation of the Manton site at Warrewau Tea Plantation in 1966, reported at the 1967 Canberra Seminar, attention shifted to the nearby Kindeng site where a season of excavation was undertaken in 1968. The discovery in 1969 by Jim Allen of the major site at Kuk plantation (Figure A4) then led to a series of six field seasons of excavation, directed by Golson, between 1972 and 1977 that produced the bulk of the archaeological material now available^8. The complex of sites referred to here collectively as "Kuk" dominates the archaeological landscape of Highland New Guinea, by virtue of its size and internal complexity, the research effort and analytical literature devoted to it and its significance^9. The significance of Kuk, both for the region, and for world archaeology over the 9000 year span of the site, has been carefully sketched out over twenty-five years by its principal investigator, Jack Golson. The long shadow cast by Kuk over the archaeology of the rest of the Highlands has led to charges of a "Kuk-centric" view of regional archaeology

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7. A claim that found a precedent in Brookfield's earlier conclusion that the 'question [of the correlation between population density and agricultural intensity] is thus thrown back to the problem of population increase itself' (1962:253).
8. By 1976, Golson could refer to the results from the digging of 2000 m of drains, the recording of a further 4000 m of drain wall, the clearance of almost 100,000 m^2 of grass to examine surface features, hand-probing of a 28,000 m^2 block to plot the most recent drainage system and the excavation of five house sites (1976d:210).
9. The term "Kuk" is used here to refer to the individual site of Kuk plantation, and "the Kuk complex" to refer to the entire complex of Wahgi valley wetland sites, including those at Draepi/Minjigina, the Manton site, Kindeng, Kuk, Mugiampai, and the North Wahgi swamp. The locations of these sites are illustrated by Golson (1976d:Fig.2) and Harris and Hughes (1978:Fig.1).
(V. Watson 1989); but with little opportunity for research on a comparable scale in the foreseeable future, the attention paid to Kuk must be seen increasingly as a virtue made of necessity.

Golson's interpretation of components of the Kuk sequence has altered since 1977 but the theories current during the period of excavation, expressed in a series of publications from 1967 to 1977, obviously influenced his approach to fieldwork on the site and significantly structured the collection of the archaeological evidence. Full publication of the archaeological results from Kuk has been delayed\(^\text{10}\), reflecting both the material complexity of the site, and the changing influence on Golson's thinking of new results and ideas from other disciplines. Indeed, the development of what Golson refers to as 'a series of provisional statements' (1990:140) provides extensive insight into the relationship between changes in evidence and explanation in archaeological reasoning. A brief generalized summary of the sequence at Kuk is followed by a more focused discussion on the form of Golson's explanations for reclamation and abandonment of the Kuk wetlands, with particular emphasis on his account of the impact of sweet potato.

The main Kuk site consists of an alienated block of 700 acres of wetland, hemmed in to the north by Ep Ridge and bordered on the south and west by a lahar fan deposit from the Mt Hagen volcano from which a gently sloping alluvial fan extends into the southern margins of the swamp. A complex suite of archaeological features has been exposed in drains dug at Kuk for a Tea Research Station. The basic stratigraphy at Kuk has been described in some detail by Golson (1976d, 1977a), and is summarized in a composite form in Figure A5. The most striking feature of the site is the sequence of successive phases of reclamation and abandonment of the swamp, evident in the form of infilled networks of ditches. Golson has identified six major phases of use, separated by periods in which the ditch system became infilled and the swamp gardens were apparently abandoned.

Figure A5 provides a summary of the phases of use, together with the radiocarbon or inferred dates of swamp phase initiation and abandonment, and a tabular account of Golson's changing interpretations over time\(^\text{11}\). The basic distinction drawn by Golson within the sequence is between Phases 1 to 3, on the one hand, and Phases 4 to 6 on the other: 'During phases 1-3 the drainage works necessary to make the wet land fit for gardening consist of a single major disposal channel... During phases 4-6 the drainage works are more elaborate, as though the wet land had become progressively more difficult to manage' (1982a:300-301). Phases 4 to 6 are the more significant for this thesis, but reference is made to Golson's analyses of the earlier phases where they illuminate the structure of his broader argument.

As the anthropologist Nicholas Modjeska has noted, 'the major problems [at Kuk] have to do with the delineation of their phases and their interpretation as a meaningful sequence of stages' (1977:29, my emphasis). For approximately 2300 of the last 6000 years, the swamp has been abandoned, and much of Golson's writing has addressed the circumstances of abandonment and reclamation. His early views accorded well with the sentiments of the Canberra seminar: '[t]he conditions that governed the course of New Guinea Highlands agricultural history were the crops that were grown, the methods by which they were cultivated and the environment in which the cultivation took place' (1977b:47). At Kuk,

\[\text{e}\text{s}f\text{e}nt\text{a}t\text{y} \text{is of periodic innovations in agricultural technology in response to crises in the practice of shifting cultivation brought on... by its very success as measured by the growing populations}\]

\(^{10}\) The first details of one of the Kuk phases are now available (Bayliss-Smith and Golson 1992a, 1992b); these are discussed further below.

\(^{11}\) Human activity in the Kuk swamp catchment is inferred from about 20 000 BP on the basis of an increase in inwashed sediments (Golson and Hughes 1980:296-297).
it could sustain,
a process witnessed archaeologically as,

an alternation of periods of swamp reclamation and swamp abandonment whenever some further innovation in agricultural technology took place. The agricultural system is thus seen to be in continuous adjustment to the effects of the transformation of the environment for which its operations are responsible.

Golson (1977c:17)

In taking constant population growth as the source of pressure on the system on the one hand, and technological innovation as the means of release from such pressure on the other, Golson (1970, 1977c) drew his inspiration explicitly from Boerup’s theory of population-led economic transformation. Golson’s model for the agricultural systems and the particular forms of technological innovation at Kuk derived, however, from the writings of local geographers such as Brookfield, Waddell and Clarke, who were themselves heavily influenced by Boerup (Clarke 1966:357, Waddell 1972a:218-219). A key element in this model was the distinction between wet- and dry-land subsystems within the broader agricultural system. It was argued that the greater labour inputs required to permit wetland cultivation acted as a deterrent, to be over-ridden only through the pressure of stress on available dryland created by an increasing population. Wetland cultivation thus served as a ‘temporary solution’ to alleviate dryland stress until the ‘long-term solution’ (Golson in Henderson 1977:19) of a technological innovation permitted a return to emphasis on the dryland subsystem, with consequent abandonment of the wetlands. Successive abandonments of the Kuk wetlands, therefore, were attributed to the innovations of complete soil tillage (marking the end of swamp phase 3 at 2500 BP), tree fallowing (the end of swamp phase 4 at 1200 BP) and raised-bed gardening (the end of swamp phase 5 at 250 BP), each of which allowed a more intensive form of dryland cultivation and dispensed with the need for labour-demanding wetland cultivation.

One of the consequences of a history in which dryland degradation is the critical marker of change has been a heavy reliance on insights gained from geomorphology and palynology. In part, this reliance stems from the fact that Golson has been attempting essentially to write a history of dryland agriculture from what he has defined as its negative pole - wetland cultivation. The difficulty of identifying dryland systems at Kuk comparable to those in the wetlands has been the topic of a doctoral thesis by Paul Gorecki (1982), discussed further below. The perceived ability to identify forest degradation and the development of grassland communities encouraged Golson to link his explanations for the wetland drainage systems directly to pollen evidence for dryland degradation.

The limitations of Golson’s early models for swamp reclamation and abandonment at Kuk are most clearly exposed in his interpretation of Phases 5 and 6 and in his treatment of the impact of sweet potato on the drainage system. Waddell and Clarke, amongst others, had demonstrated that sweet potato possessed clear advantages over any possible pre Ipomoea staples in terms of its yields at altitudes above 2000 m, and its tolerance of poorer soils (see Table B7). If sweet potato were to be deployed as an innovatory release, then the agricultural model would predict an expansion of dryland cultivation onto poorer soils and an increased productivity at higher altitudes, creating ‘room at the top’ (Golson 1977a) and an immediate abandonment of the wetlands upon adoption of the new crop (Golson 1976c:21-22). However, this prediction, consonant with the general model underlying the explanation of all the other phases at Kuk, sat awkwardly with the archaeological evidence for the phases when the introduction of sweet potato might have been expected.

The presumed sixteenth-century date for the post-Columbian introduction of sweet potato to Southeast Asia (see Section A2.3) falls precariously close to the date of
370 ± 70 BP (K-2643) that marks the initiation at Kuk of Phase 5 of drainage (Golson and Steensberg 1983:375-6). Golson’s response was to identify an internal distinction within Phase 5, conveniently demarcated by the presence of the Tibito ash, then dated at about 250 BP (see Appendix A3), between a more extensive system from 370 BP to 250 BP (Phase 5), and a contracted, more intensive drainage network from 250 BP to about 100 BP (Phase 6) (1977a:628). The latter phase, he proposed, could be interpreted as the consequence of the introduction of sweet potato to the Kuk system. Yet this was not only in conflict with the agricultural model of wetland abandonment following on innovation, but implied that the wetland system was finally abandoned at 100 BP at a time when maximum pressure on the dryland system could be assumed - precisely the conditions under which wetland reclamation had been predicted for earlier phases. In part, this second problem could be explained by the transfer of a further innovation, the raised-bed technology of Phase 6, from the wetlands, where it had been developed for sweet potato, to the dryland system (1976a:8). But Golson still found it ‘difficult to believe that a plant with the proven advantages of the sweet potato... would have been almost immediately brought into swamp cultivation, particularly when a special effort was necessary to render swampland suitable for its cultivation’ (1976a:7), or that sweet potato could have reached the Highlands so shortly after its presumed post-Columbian introduction:

acceptance of this hypothesis requires us to believe that within 150 years of its introduction, the plant had spread into the Mt Hagen district, been accorded a primary role in agriculture and despite its requirements for dry, friable soil, been incorporated into systems of cultivation in drained swamp that had not operated for 900 years.

Golson in Powell et al 1975:45

A more elegant solution proposed by Golson in order to preserve the integrity of the technological model was an earlier introduction for sweet potato, to coincide with the end of Phase 4, at 1200 BP (Golson 1977a, 1977b). The pollen record for this period showed both an increase both in forest degradation and in the values for the common tree-fallow species, Trema (since renamed Parapsonia) and Casuarina (1977b:51-52). Taken with the evidence from Kuk of a total abandonment of the drainage network of Phase 4, this proposal was seen to fit ‘the prediction that labour demanding agricultural operations would cease when the agronomic potential of the sweet potato was discovered’ (1976c:25). In an aside, Golson wondered if ‘the practice [of tree fallowing] was handed over together with the sweet potato when that plant made its entry’ (1977a:625). The pollen evidence for widespread clearance thus reflected, according to this explanation, the expansion of settlements exploiting the agronomic advantages of sweet potato, a move which led in turn to increased dryland degradation and ultimately to the need to reclaim the wetlands in Phase 5 (1977b:52).

Apart from the obvious lack of any direct evidence for sweet potato in New Guinea at such an early date, Golson was quick to acknowledge that there were other problems with this speculative "early" introduction model: the possibility of a later abandonment of the Manton site, which would accord better with what he called the "orthodox" model for late sweet potato (1976c:28, 1977b:51), while the obvious recency of much high altitude settlement with sweet potato in the Highlands also implied a late introduction (1976c:33-34). A retraction of the early model came only, however, with the recognition that the relevant pollen diagrams consisted of relative frequencies and not absolute counts (1977b:54); the apparent reduction of forest taxa at 1200 BP might thus be interpreted as a relative increase in Trema and Casuarina pollen, rather than an absolute decline in forest pollen. If this were the case, the innovatory release at 1200 BP could perhaps be referred to the increased use of tree fallowing on dry land, obviating the need for sweet potato as an explanatory deus ex machina.

12. The relevant pollen diagrams from the Wahgi valley (Powell 1970) reflected the relative proportions of different species from only the first 200 pollen in each sample.
Golson's earlier writings, between 1966 and 1977 (Appendix A2), thus reflected a view of social change determined by the technological limits on a continuously increasing population, with consequent land degradation forcing ever more labour-intensive short-term solutions such as wetland reclamation, and technological innovation serving as a longer-term release upon labour inputs. The scope for human agency, under these terms, consisted largely of the tension between population pressure and the acceptability of labour inputs. One of Golson's few direct references in his earlier writings to local social factors influencing the sequence at Kuk was his discussion of the scope for disruption of the drainage network through loss of control of the main channel outlets (1977a:619). Elsewhere, Golson suggested that 'because the settlements of the cultivators have not been found, we have no idea of the relationship of developments in agriculture to developments in society' (1977c:18). His more recent writing, from 1980 up to the present (Appendix A2), bears the traces of many of the assumptions of this earlier period but radically readdresses the role of society in agricultural change, reflecting the influence upon Golson's thought of a second wave of anthropological speculation, which is the subject of the following section.

5. Social Production, Social Logic and Social Evolution

In terms of the Ipomoean Revolution debate, 1977 marked the Year of the Pig. After a decade in which the issues raised by Watson had apparently ceased to interest anthropologists in the region, three authors, Morren, Modjeska and Watson himself, simultaneously redirected attention to the importance of pig husbandry in the development of modern Highlands societies. Morren (1977), from a rather narrowly ecological perspective, asserted that the key dilemma facing regional subsistence economies threatened by population increase was access to sufficient meat and fat. As the destruction of forest limited the availability of non-domesticated sources of protein, an intensification of agricultural practices developed from the need to support larger numbers of domesticated pigs. This process Morren described as a 'very slow "revolution"... Susian rather than Ipomoean' (1977:313), an obvious expression of sympathy with the Canberra seminar model.

Watson, in a delayed response to Brookfield and White, found their "simple" hypothesis for sweet potato adoption unconvincing in its invocation of 'the force of efficiency as the motive for change. It contemplates isolated actors [Brookfield's "farmers"]. And it projects a materialism uncluttered by social or cultural cross-currents' (1977:58). To explain why the sweet potato should have been adopted so extensively and quickly, Watson argued, in a "Pig Fodder Addendum" to his 'Jones Effect' theory, that the success of sweet potato hinged upon its exceptional performance as pig fodder. As evidence for this he cited the synonymy within various languages of the words for sweet potato and fodder, the exclusive use of sweet potato as fodder amongst those groups that preferred taro for human consumption, and the correlation of intensive pig production with intensive sweet potato cultivation.

From this basis, Watson suggested that the prestige of owning and exchanging pigs had led to a 'chainlike escalation' in pig production and exchange in which the cost of maintaining pigs needed to be balanced against the cost of not having pigs, the latter being 'a good measure of the Jones Effect' (ibid:64). The prestige accorded to pig transactions thus made 'the ipomoean conversion of people after people a compelling force for their neighbours' (ibid:60). Typically, Watson then proceeded to speculate on the broader implications of an increase in pig numbers: with an increase in the ratio of fodder to forage in pig subsistence, a dispersal of settlement might be expected; there would also be an increased need for controlled movement of herds and protection of gardens with fences and ditches, and for sweet potato gardens segregated from mixed crop gardens and devoted to pig fodder.

Modjeska's 1977 doctoral thesis, still one of the more influential pieces of anthropological writing on the New Guinea Highlands, marked a return to Watson's
"sociological factors" of explanation, with particular emphasis on the notion of production. Modjeska's use of the concept of social production had its roots in part in the later writings of Brookfield who, in revising his stance at the 1967 Canberra Seminar, had begun to qualify his Bosuerian assumptions: Brookfield now allowed for the possibility of disintegration, noting that populations could decline as well as increase (1972:35). Much as Watson had earlier suggested, Brookfield acknowledged that production in the Highlands, most noticeably in association with major cycles of pig exchange, far exceeded subsistence needs. Taking a largely invariable level (relative to population size) of production for subsistence needs as a basic requirement of any subsistence strategy, Brookfield identified further levels of production for "social" and "trade" purposes, neither of which could be linked directly to environmental conditions or ecological cycles (1972:37-38). Investigation of these factors would require 'an understanding of human needs and motivation' that he had not previously considered, and 'a much more adequate theory of production... which will relate production to society as a whole, and rid the subject of its long-lived calorific obsession' (1972:46) - a task, as Brookfield later noted (1984:15), that he was unable at the time to address.

Both Watson's and Brookfield's insights found fuller expression in the writing of Modjeska for whom the key to an understanding of production lay in identifying the historical transformation of human needs and motivation, tracking the development of 'the concept and social reality of value to its core, to pursue value's subject, here principally the pig, to its basis in human labour and life' (1982:51). Strongly critical of the assumption of the Canberra seminar that intensification followed necessarily from population growth, Modjeska echoed Watson in advocating an emphasis on the role of human agency in changes in productive intensity: '[i]nstead of assuming that societies are propelled passively from one technological system to another by naturally increasing population and the principle of least effort, one can assume that the transformation of production systems begins with human intervention' (1977:73).

If the decision to increase labour inputs reflected cultural ideologies and the relations of production particular to any given society, then 'possession of the sweet potato alone [did] not automatically bring about the intensification of production' (1977:49). Variations in the level of agricultural intensity and commitment to sweet potato thus implied different relations of production and different forms of motivation, or economies of value. Taking eight Highlands societies of variable population density described ethnographically, Modjeska then sought to demonstrate the existence of a broad correlation between the gross size of linguistic units, population density, the ratio of pigs to people, the intensity of horticultural production and the elaboration of systems of exchange (1982: Table 1). He found that the clearest means of ordering these societies along a continuum of increasing productivity was to take pig production as the key index of horticultural intensification more generally (1977:45).

These correlations Modjeska assumed to be related causally, and he proposed two cycles, one of ecological use-value, the other of exchange value, to model the process of intensification (1982: Figures 1 and 2). The crucial element in both cycles was the pig: as a substitute for declining wild game and a contributing factor in the rise of populations (the ecological use-value cycle), and as the key item in the increased need for social mediation, particularly in warfare indemnities and brideprice payments, in expanding populations (the exchange-value cycle). The revolutionary move in this process Modjeska identified as the transformation in the value of the pig to a position

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14. Over time, Brookfield has successively reintroduced many of Watson's original insights: the role of conservative brakes on change (1984:34), the recognition that innovations can be social, as well as technological, in character (1984:16), and the significance of the Jones Effect in the spread of exchange networks (Brookfield and Allen 1988:7).
where it could be deployed as 'a mediative substitute for lost human life' and as a valuable that could be exchanged for rights in humans through marriage (1982:55-57). The 'ethnographic sequence' identified by ordering the eight different groups along a continuum of increasing intensity of productivity could then be used as a model of the history of intensification, as 'empirical examples of so many stages in the development of such a process' (1982:51). The question then posed by Modjeska was whether such a process of intensification could be detected archaeologically.

Having already criticized the gradualist foundations and crude technological determinism of the position adopted by the Canberra seminar, Modjeska argued that archaeological evidence had to be seen 'in relation to the active creation of social relations by human beings conceived of as something more than the passive victims of autonomous forces' (1977:93). His reading of Golson's interpretation of Kuk thus addressed the influences of the Canberra seminar, evident in the assumptions that swamp reclamation was only a response to the pressures of population increase upon dryland systems, and that swamp agriculture was simply a more labour-intensive form of, and thus less preferable substitute for, dryland agriculture. Noting Clarke's observation that swampland drains produced a highly fertile cover of upcast soil, Modjeska suggested that 'the swamp cultivation phases at Kuk represent periods in which increased absolute amounts of labour were invested to create systems offering improved ratios of productive efficiency' (1977:85). Subsistence may not thus have been 'the only important call on production' (Golson 1981b:62) at Kuk; social factors could also have provided the motivation for the heavy initial investments in drainage systems that would yield more highly over time.

What role did the sweet potato therefore play in the evolution of Highlands societies, and particularly in the development of the systems of ceremonial exchange that appeared to coincide with the centres of highest productive intensity? The revolutionary effect of sweet potato, Modjeska suggested, reflected its adoption in areas such as Kuk where intensive systems of wetland production in which taro was the staple had already forged 'the relations of production which made the Ipomoean revolution possible' (1977:88). Although he allowed for the possibility that pigs may already have constituted the principal exchange valuable created with pre-Ipomoean wetland surpluses, the established connection between pig husbandry and sweet potato as fodder led Modjeska to advance an alternative 'even more speculative suggestion': that the stone mortars, pestles and other carvings found throughout the Highlands region represented a comparable pre-Ipomoean valuable, deployed in a way that prefigured the exchange of pigs after the adoption of sweet potato (1977:88-92). No archaeologist has attempted to pursue this possibility, but the more immediate value of Modjeska's speculation is that it identifies society more broadly as the appropriate context in which to comprehend the impact of sweet potato:

the gap between the low intensity, taro based societies of the ethnographic sequence and the high intensity, sweet potato-based systems cannot be bridged by the introduction of sweet potato alone. For a transformation of production systems to have taken place, new relations of production were required in addition to new materials. People had to choose to work harder in order to produce more. Modjeska 1977:87

Modjeska's focus on the historical significance of change in the construction of value has influenced attempts by two French ethnographers, Maurice Godelier and

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15. Modjeska took Golson to task for his account of the impact of sweet potato at Kuk: the introduction of sweet potato could not be invoked for both of the swamp abandonments at 1200 BP and between 250 BP and 100 BP; if sweet potato was introduced (to account for events at) at 1200 BP, it could not then have the same revolutionary effect at 250 BP. Further, the abandonment of intensive systems of wetland taro agriculture, at either 1200 BP or at 250 BP implied, however negatively, that the impact of sweet potato adoption was indeed revolutionary.
Pierre Lemonnier, to specify the exchange principles, or logics, that underwrite different social formations in the Highlands. Where Modjeska took the production of pigs, expressed in the form of pig-to-person ratios, as the critical index to such change, Godelier used types of political leadership to distinguish between different logics of exchange. Finding that the "big-man" form of leadership, identified by Sahlin as characteristic of leadership in the Highlands, failed to describe adequately conditions amongst the Baruya-speakers with whom he worked, Godelier proposed "great-men" as the precipitate of an alternative "global social logic" (1982:31). The two contrasting leadership types were founded on different principles of exchange: the principle of equivalence amongst great-men societies and that of non-equivalence amongst big-men societies. In the first, direct exchange of valuables equivalent in both quantity and quality prevailed, expressed in the ideals of sister-exchange and homicide revenge, ideals which were reproduced through the institution of initiation ceremonies. Big-men emerged 'as a particular variety of great men, arising wherever competitive exchanges have diminished the relative importance of war and warriors... wherever exchangeable material wealth can be exchanged for anything, and above all for women' (1986:185). The ability to substitute wealth for life (or rather the rights to life) and the development of finance as a mechanism of exchange marked off big-men societies from all others in the region.

Lemonnier (1990) subsequently expanded on Godelier's typology, introducing an intermediate type, that of the "leader", to describe the majority of Highlands societies in which the principles of equivalence and non-equivalence were combined with varying degrees of emphasis. Big-men and great-men logics thus form two poles of a vast system of structural transformations (Godelier 1991:276), logical types rather than historically specific forms. As for Modjeska, however, the temptation existed for Godelier and Lemonnier to perceive in their hierarchies a model of historical transformations culminating in the emergence of big-men systems amongst societies of the Enga and Western Highlands provinces. Both were conscious of the limitations of evolutionary sequences (Lemonnier 1990:65), and tended to shy away from any attempt to ground their transformational sequences in historical evidence or even to pronounce on causal relationships between variables such as pig numbers and social structures, preferring to talk of 'theoretical passage[s]' (Lemonnier 1991:27) and 'logical transformations' (Lemonnier 1993:52), and referring to attempts to historicize the transformations as exercises in 'social science fiction' (Godelier 1991:301), or as 'histoires imaginaires' (Godelier 1990:19).

Yet there were traces of ambivalence in their writing: big-men logics were referred to as 'emerging' from great-men logics and Godelier has speculated on the relationship between the development of ceremonial exchange systems and the disappearance of initiations (1986:184). Most recently, goaded by Modjeska's (1991:238-239) charge that he had balked at an historical understanding of this transformation, Godelier has described the transformation of great-men societies into big-men societies as a historical change in the relation of dominance between the two underlying principles of equivalence and non-equivalence (1991:284), declaring that 'these two logics could be considered to be two stages of an evolution which corresponded to an as-yet undiscovered socio-historical process' (1991:276). The latter statement, interestingly, declines to privilege either pole historically: there is no assumption that big-men societies emerge historically from great-men societies, or vice-versa.

In the work of Daryl Feil (1985, 1987, 1989), the themes raised by Watson, Modjeska and Godelier were brought to bear upon a comparative synthesis of a huge body of both ethnographic and archaeological material. Although Feil's grasp of the ethnography of the region was impressive, the results of his analysis were disappointing, and it is instructive for archaeologists to understand why this should be so. Feil's work rested on the claim that he had 'spurned synchronic or structural comparisons between societies in favour of an evolutionary one' (1987:271). Yet when he searched for a diachronic overview of the past on which to ground his understanding
of Highlands ethnography, 'there was none to be found' (1989:119). His own account of Highlands archaeology thus drew explicitly on a long tradition of anthropological speculation (1987:11). Nowhere else within this tradition, however, are the difficulties involved in reading the past from the present more evident.

Feil's definition of the Highlands region was restricted to the area of the Enga, Western Highlands, Simbu and the main valleys of the Eastern Highland provinces, with occasional forays wider afield to the Baruya or to Southern Highland groups such as the Huli (Figure A.3). Within this area, he argued, fundamental differences between the environments of the eastern and western ends of this geographical continuum, particularly in the seasonality of rainfall, had fostered radically different pre-Ipomoean subsistence strategies. This environmental variation was reflected in the respective archaeological records of the two regions: in the west, Kuk was regarded as the "birthplace" of highlands agriculture and the efflorescence of social and cultural practices associated with an intensified agricultural regime' (1985:88). The long Kuk sequence, indicating a pre-Ipomoean presence for intensive taro and pig production, was contrasted with the situation in the east where 'the pattern of mixed hunting, collecting and nascent agriculture occurred until very late' (1987:29). This model was thus effectively a regionally specific retention of Watson's original "preferred" model in the Eastern Highlands. Successive technological and social innovations which were introduced at Kuk diffused, often millennia later, to the east: these included pig husbandry, the use of casuarina in fallows, and complete tillage of the soil.

According to Feil, the impact of sweet potato on these vastly different economies further confirmed their already 'divergent lines of development'. Amongst the intensive production systems of the west, the superiority of sweet potato over existing staples and fodders was immediately appreciated. Sweet potato here 'was taken in stride by an agricultural complex already geared to surplus production' (1987:8) and exploited in the intensification of pig husbandry and the further development of systems of financed exchange. In the east, with its 'shallow' history of agriculture, the sweet potato was adopted more gradually, with a further delay in the recognition of its value as pig fodder; consequently, the development of pig husbandry and pig-related exchange witnessed in the west was 'still-born before it could take off' in the east (1987:34). Production in the east remained 'domestic-oriented, constraining, inward-looking, narrow, and with limited objectives' (1987:30).

Feil argued that these different rates of change were evident ethnographically in 'a continuum of intensifying agricultural production from east to west'. Intensity, interpreted as the level of inputs of 'capital, labour, skill and so on' into agricultural production, operated as a broad, but not constant, index to variation in agricultural practice, settlement pattern, political integration, land tenure, the size of language groups, and the numbers and densities of pig and human populations. The correlation of these different indices produced distinct configurations of intensity, 'constellation[s] of elements which logically and empirically go together' (1987:168, my emphasis); these configurations were most clearly expressed, as for Modjeska, in the relative size of pig herds. Indeed, Feil declared that 'agriculture itself is almost epiphenomenal (or at least a dependent variable) to the concern with pig husbandry' (1987:40). When ranked on a scale of relative intensity, these configurations revealed a continuum running from low-intensity configurations in the east to high-intensity configurations in the west. Feil's major concern was to show how this continuum was expressed in terms of east-west variation in warfare, political formation, social structure, gender relations and ceremonial exchange - a rather conventional list of "institutions" that lacked only ritual and religion to be complete.

This analysis of the regional ethnography has been subjected to some criticism (e.g. Brown 1989, A.Strathern 1990), as has Feil's interpretation of the figures for pig-person ratios (Bourke 1988: Table 2.3), but most problematic was the way in which Feil combined ethnography and archaeology to speculate about history. Yet although subsequent archaeological evidence has not supported his conjectures about pre-
Ipomoean economies in the eastern Highlands (see below), this cannot be taken as
grounds for rejecting Feil’s broader statements: the lesson of the Canberra seminar
should have alerted us to the dangers of a hasty dismissal of speculative contributions
from beyond archaeology. But it was precisely Feil’s conception of the past, and of the
relationship between past and present, that was the most disappointing feature of his
argument.

While Feil appeared to work from an understanding of the past towards the
present, in which ethnographic difference ‘merely echoes the prehistoric pattern’
(1987:49), the direction of his analysis in fact reversed this claim. Archaeological
evidence was not so much examined as marshalled in ‘confirmation’ (1987:13) of his
ethnographic analysis. In his concern for the integrity of the east-west continuum, Feil’s
use of archaeological evidence served instead to raise doubts about the strength of his
configurational approach. For example, Feil’s claim that the localised concentration of
stone mortars, pestles and other carvings in the western highlands reflected ‘their early
association with agriculture, and their lack of spread to the eastern highlands with its
absence there’ (1987:33) grossly distorted the published evidence for the distribution of
stone mortars, and posited precisely the sort of relationship that needed to be
demonstrated and explained, not asserted in a compilation of further support for his
dichotomy.

More troubling from a historical perspective was Feil’s ordering of the past. This
was firmly rooted in his understanding of the present:

as one moves westward in the highlands... there is strikingly intensified
production (by any measure) geared to the intensified production and
maintenance of pigs. This fact above all else provides the rationale of
the production process, at least at the western end of the continuum.

Feil (1987:40), my emphasis

Why then, it should be asked, were communities at the eastern end of the continuum
ranked according to principles of value generated in, and possibly specific to, the
western end? This privilege accorded to a particular configuration in the tabular space
of the ‘ethnographic present’ was transformed by Feil into a telos, or end-point, for the
history of all Highlands communities. The ethnographic continuum, underpinned by a
confirmatory past, now represented a ‘particular evolutionary sequence’ or ‘evolutionary

Although Feil made frequent reference to ‘divergent’ lines of development, a
temporalizing tendency evident in his writing has imparted a distinctly unilinear quality
to his history. Like Modjeska, Feil felt that it was possible to ‘glimpse in the
contemporary pattern of divergence across the highlands the evolutionary sequence
which has taken place’, in which the eastern end represents the ‘developed’, flourishing
western highlands... only in embryonic form’ (1987:91) and societies of the west were
regarded as a ‘final configuration’ (1987:7, my emphasis). History on these terms was

16. Stone mortars and pestles are fairly evenly distributed from east to west in the Highlands. In fact,
their greatest concentration in New Guinea appears to be in the Kainantu area, at the extreme eastern
end of Feil's continuum. The more obvious spatial variation is a decline in distribution from north to south,
an axis not addressed by Feil. The irony of this misreading of the archaeological literature is
compounded by the fact that Feil used Swadling's published report on the archaeology of the Arona
Valley (1973) to establish the absence of pre-Ipomoean agriculture in the east but ignored the numerous
references to, and illustrations of, stone mortars and pestles contained in the same report.

17. Feil's (1987) text is saturated with temporally loaded descriptions of ethnographically "contemporary"
societies: features of eastern societies are described repeatedly as 'nascent' (pp 29,49,60,65,269), 'poorly'
or 'under-developed' (pp 49,60,125), or 'late' (pp 23,29), versions of their western counterparts. To 'lack'
(pp 18,125) in the ethnographic present is to be at an 'early stage' (p 231) of development, to 'not yet' (pp
47,60,104,166) have 'achieved' (p 36) full evolutionary potential, or even to be 'underproductive'
conceived of as a 'developmental path' (1987:9, see also pp 5,53), leading towards the intensified agricultural and pig production of the west, which societies in the east then 'follow' (1987:272). modern differences between east and west were thus the function of a 'lag in economic transformations' (1987:88). Effectively Feil replaced unicausality, which he rejected in determining variations in productive intensity (1987:8,39), with a unilinearity in the trajectory of historical change that valorised a particular social configuration in both space and time. This, as E.P.Thompson (1968:13) would have it, is

history in the light of subsequent preoccupations, and not as it in fact occurred. Only the successful (in the sense of those whose aspirations anticipated subsequent evolution) are remembered. The blind alleys, the lost causes, and the losers, are themselves forgotten.

Though far more comprehensive in its treatment of the regional ethnography and archaeology than any previous work, Feil's thesis thus suffered from its commitment to an over-rigid continuum or sequence, however 'overriding [an] order and pattern' (1987:5) he might have discerned in the evidence. Where the models of Watson and Godelier provided for some flexibility in application, Feil offered a "totalizing" account of the past, a model which ran the risk of being less amenable to the incorporation both of other regions, such as the Southern Highlands or the Baliem valley in Irian Jaya (A.Strathern 1990), and of new ethnographic or archaeological evidence.


Modjeska's critique had an immediate impact on Golson's interpretation of Kuk\(^\text{18}\): in his next wave of 'provisional statements', Golson acknowledged that his earlier position had accorded human agency 'an essentially negative role, acting only in reaction to environmental changes' (1981:b:62). In his major response to Modjeska, Golson (1981b) set out his most imaginative reconstruction of the Kuk sequence: published in the context of a volume on inequality in Highlands societies, Golson's paper addressed the genesis of the social stratification witnessed at contact in the Wahgi valley. Access to the productive swamplands, Golson argued, would have generated distinct local inequalities in the ability of different communities to produce crops and pigs. The introduction of sweet potato reduced the productive "edge" of swampland communities as it enabled other communities to engage in intensive production on the dry lands and on poorer soils. The move by established elites from pigs to shell as a more exclusive valuable maintained their relative status but this, in turn, was destroyed by the early European use of shell in the 1930s, introduced in massive quantities and breaking the ties of exchange formerly monopolised by the elites.

This bold excursion into ethnographic history entailed a revision by archaeologists of the view of swampland drainage systems as unattractive, labour-intensive alternatives to dryland agriculture. Gorecki's (1982) attempts to locate dryland systems associated with the wetlands at Kuk had yielded only one phase of dryland gardens beneath the Tibofo ash fall (305 - 270 cal BP), leading him to support Modjeska's speculation that the dryland systems may have been 'complementary, if not marginal' (Gorecki 1985:342) within the overall economy of those groups with access to wetlands. Gorecki proposed instead that drained-garden technology might in fact have been regionally continuous throughout the extent of the Kuk sequence but locally discontinuous within the Wahgi wetlands, generating the impression at Kuk of phases of use and disuse (1986:165): a process that Golson, drawing on his own ethnographic observations at of Haepuapua swamp in the Southern Highlands, has since dubbed the

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18. The "break" in Golson's writing induced by his reading of Modjeska occurred in about 1980 (Appendix A2: Golson 1981a, 1981b, 1982b) even though, in papers written shortly after these, he still adhered to the view that the 'path which the environmental modification follows calls repeatedly for developments in agricultural technology and determines the form which agricultural intensification takes' (1982a:301).
"palimpsest effect" (1990:142).

This increasingly sophisticated modelling of wetland use has not, however, alleviated Golson's difficulties in accounting for the phases of use and abandonment at Kuk itself. A late introduction of sweet potato is still invoked as the cause of abandonment of the larger part of the Kuk wetlands at 250 BP, with Gorecki's (1979) case for the onset of malaria epidemics held to account for the abandonment of both dry- and wetlands on the floor of the Wahgi valley after 100 BP (Golson 1982b:135, Golson and Gardner 1990:407). Significantly, the possibility of an earlier arrival for sweet potato has also been intermittently reintroduced to explain the abandonment of Phase 4 at 1200 BP, a move that effectively betrays the continuing ecological tendency in explanation at Kuk.

The discovery in 1976 of a wooden spade dated to 4000 BP (Golson and Steensberg 1985:376) from the Tambul site at an altitude of 2240 m in the upper Kaugel valley (Bayliss-Smith 1985a, Figure A4) raised the question of the scope for intensive taro production at high altitudes prior to the introduction of sweet potato, a possibility not previously considered for such environments. An experimental study of taro productivity in the Wahgi valley and at Tambul by Bayliss-Smith (1985a) suggested that taro swidden was a plausible basis for a subsistence economy over 2000 m, but that the labour requirements would have prohibited wetland drainage for taro. While he identified the initial expansion of taro-based agriculture and permanent settlement to higher altitudes as a "Coloasian revolution", Bayliss-Smith still acknowledged that the major transformation in terms of crop yields, population density and pig husbandry would have required sweet potato. Drawing on this experimental data on taro productivity, Bayliss-Smith and Golson have since attempted to model the scope for intensive production during Phase 4 at Kuk, describing the onset of Phase 4 as 'the genesis of Wahgi society as known ethnographically' (1992b:23).

The description that Bayliss-Smith and Golson offer of the Phase 4 system is the first comprehensive analysis of any of the wetland data from Kuk, and the level of resolution permitted by the archaeological material affords some insight into the stratigraphic complexity of the site as a whole and the impressive scope it offers for reconstruction of wetland technology. In keeping with the emphasis of this review, my interest here is in the forms of explanation generated for the initiation and abandonment of Phase 4. Broadly, these explanations draw on the views propounded by Golson since his earliest reflections on Kuk in 1976, with some modification to accommodate Modjeska's critique. Bayliss-Smith and Golson propose that Phase 4 was initiated in response to a crisis in dryland agriculture which could not be alleviated through expansion with intensive techniques to higher altitudes. In accounting for the form of the response, Modjeska's "pull" factors are noted:

Intensification was the only answer, and the opportunity for surplus production provided a substantial compensation, and perhaps ultimately a rationale in itself, for wetland drainage.

Bayliss-Smith and Golson 1992a:15

But the preference for ecological or technological determination is still evident in the description of the grounds for wetland abandonment. Phase 4 terminates with the releasing effect of the innovation of tree fallowing (1992a:19), and the political instability leading to the collapse of the Phase 6 drainage network is seen to reflect the lack of ascribed leadership in Upper Wahgi society, an example of 'technology outstripping the ability of the social structure to control it' (Golson 1990:142-143).

While there has been little further collection or excavation of new material from Kuk since 1981 (Golson pers.comm.), there have been considerable advances in the development of a regional context for the Kuk results, which is seen as confirming the antiquity of many of the components of the Kuk sequence (Golson and Gardner
The three new archaeological regions of principal importance are those of the Jimi, Bialiem and Arona valleys. The Yeni swamp sites of the lower Jimi valley (Figure A4), immediately to the north of Kuk, were excavated by Gorecki (1989) with the intention of recovering the postulated lower-altitude antecedents for Kuk. While no evidence for occupation, much less agriculture, preceding that of Kuk has been forthcoming from the Jimi valley, the much smaller Yeni swamps have yielded a sequence of tephras and garden features from about 5100 BP that approximate the Kuk sequence (Gorecki 1989). To the west, in the Bialiem valley in Irian Jaya, pollen and sedimentary evidence suggests that major clearance was initiated by 7000 BP, and that an increase in Casuarina pollen to match that from the Wahgi valley occurred at about 1100 BP (Haberle et al. 1990). Significantly, Golson and Gardner note, there is no indication in the Bialiem valley diagram of major changes after the presumed late arrival of the sweet potato (1990:410). There have been no archaeological excavations in the Bialiem valley to shed further light on its agricultural history. Finally, in the Arona valley, at the eastern edge of the Central Highlands and of Feil’s west-east continuum, there is evidence for settlements associated with field systems dated to 4100 ± 140 BP (ANU-6185) (Sullivan and Hughes 1987, Sullivan, Hughes and Golson 1986, 1987, Ballard n.d.a.), with corresponding evidence from the nearby Noreikora swamp for forest disturbance and associated sedimentation from 4500 BP (Haberle n.d.). Intriguingly, low tree pollen counts after 1600 BP suggest an early development of the contemporary Arona grasslands, and Casuarina pollen appears from about 750 BP, implying that similar technological developments were occurring in the Eastern Highlands, if at a later date than in the Wahgi. The point to be made here is that the detail and richness of the Kuk site tends to obscure the infancy of our understanding of the archaeology of the broader Highlands region. New archaeological finds will continue to pose radically challenging alternatives to the range of existing models of social and technological development. Golson’s most recent paper concludes with a note of mild despair:

A quarter of a century later we are still in the speculative stage of reconstruction in which the Bulmers explicitly placed their pioneering paper.

Golson (1992:489, my emphasis)

7. Writing History

I have tried, in reviewing the development of the Ipomoean revolution debate in an approximately chronological form, to bring to the fore the historical relationship between anthropological speculation and archaeological revelation. One consequence of this particular perspective has been a focus on the rhetoric surrounding the deployment of archaeological evidence, by which I mean to imply that the debate can be viewed as a set of competing narratives about the past in which much of the archaeological evidence has often been either irrelevant or unsuited to the questions asked of it. Of greater importance to the actual character of the debate have been the assumptions informing the structure of the different models, expressed as a set of key "tropes" or forms of figurative writing. A brief review of these tropes provides a means of exploring the ways in which Highlands history has been conceived in both archaeological and ethnographic writing.

One set of key themes or tropes that appears to prefigure most narrative accounts of Highlands history, whether archaeological or ethnographic, can be gathered broadly under the label of "evolutionism". This refers to the tendency towards progressivism,

19. The results of further analyses undertaken on Kuk material since 1981 include work by Hather on plant macrofossils (Golson pers.comm.) and by Wilson (1985) on phytoliths; some further fieldwork has been undertaken by geomorphologists associated with Kuk project (Hughes, Sullivan and Yok (1991) and Yok (1988)).

20. Golson (1982a:299) has proposed that '[A]griculture came into the highlands from lower altitudes in step with rising temperatures and the elevation of daily cloud formation'.
where the assumption underwriting accounts of the past is that, over time, populations rise inexorably, social formations become more complex, and so on. Strongly linked to this progressivist theme is the assumption that such change leads, inevitably, along a single path of development, resulting in a unilinear account of evolution. This reflects an often tacit assertion that the nature of causative relations between, for example, intensification in pig husbandry and the development of particular social formations, is a stable one - an assumption founded, in turn, upon a strong universalism which views the agronomic potential of sweet potato, for example, as self-evident, as a fixed, "natural" property immanent in the crop itself and needing only to be discovered. These all-pervasive tropes lie at the roots of "Western" historicity - but this does not guarantee either their essential validity or universal application. First ethnographic and then archaeological accounts of the past are considered in the light of this claim.

The attempts by Modjeska and Feil to write ethnography from a historical perspective, discussed above, clearly lend themselves to an "evolutionist" reading. Despite Feil's claim that he did 'not regard highland New Guinea societies... as representing some evolutionary stage' (1987:7), there is sufficient evidence in his text to demonstrate the operation of an "evolutionism" internal to the region he addressed. Both Modjeska and Feil described ethnographic societies, ranked them hierarchically according to indices such as productive intensity ('the ethnographic sequence'), and then converted this ranking into a trajectory for historical development ('the evolutionary sequence')21. In his critique of the deployment of time in anthropology, Fabian (1983) has described the process whereby diachrony, the reduction of time to the status of an alternative axis in taxonomic projects, is substituted for any attempt to engage time as history. The result is a spatialized notion of time, producing a tabular space on which societies, irrespective of their historical circumstances, can be plotted. For example, great-men systems, once identified as 'the logical-historical origin point of the evolutionary sequence' (Modjeska 1991:241), are simply mapped onto a taxonomic matrix laid out in terms of single or complex sets of indices. This has the effect of eliminating serious inquiry into the genesis of individual societies or even the process of their transformation from one "stage" to the next, a process already defined, under the terms of their inclusion, as a logical succession.

It is important to recognise that this rather cavalier treatment of contemporary societies draws on a general and largely deliberate ignorance of the historical contingency of the "ethnographic present", an ahistoricism that is deeply engrained in both Highlands ethnography and, as Fabian seeks to demonstrate, in anthropology as a discipline. While Highlands ethnographers have drawn fine temporal distinctions in discussing individual groups22, such caution appears to have been suspended in broader comparative projects. Thus Feil, all the while stressing that 'warfare must be seen as a product of historical forces' (1987:66), drew on observations made during a period of over 40 years to compare warfare across the Highlands in the terms of an ethnographic present; this flattening of history became even more convoluted when he assigned the renewal of warfare during the 1970s and 1980s to a "post-ethnographic present" (1987:272). The focus on the ethnographic present in Highlands ethnography has tended to obscure the very conditions which generate the ethnographer's observations: these include the impact of contact, the largely neglected effects of pre- and

21. Neither are exceptional in their application of this method, which finds wide acceptance within ethnographic writing in the region. Watson (1965a:301) proposed Telefolmin, Wissel Lakes (Irian Jaya) and Karimui groups as type societies for his three-tiered evolutionary sequence; Morren (1977:301) represented the pig-husbandry techniques of the Miyanmim, Maring and Raiapu Enga as 'standing for points in a developmental continuum'; for further examples see Clarke (1966:347-348), Waddell (1972a:212, 1972b), and Sorensen (1976:93).

22. Two examples (drawn from writings that are both used by Feil as sources for his Highlands-wide "ethnographic present"): '[I]t is hard now [writing in the late 1950's] to reconstruct how Moka leadership and war leadership were related [prior to contact in the 1930's]' (R.Bulmer 1960a); 'it would be unrealistic to make comparisons too directly between Mendi clan-groups in 1954 and Hagen clan-groups in 1964' (A.Strathern 1972:193).
immediately post-contact epidemics, and the historical recency of the development of pig exchange in some areas.

A recent volume of papers on the ethnography of groups of the southern fringe of the central Highlands (Weiner ed.) 1988) has taken history as one of its central themes, providing a strong critique of the functionalism and materialism of the Highlands ethnography typified by Modjeska and Feil (Weiner 1988a). Kelly's (1988) detailed analysis of pig husbandry amongst the small and scattered communities of Etoro-speakers, in particular, has undercut the neat equation of simple pig-per-capita figures with intensification in other social spheres. As Etoro ratios exceed all but a few of the figures from central Highlands groups, Kelly argued that our focus should instead be upon the cultural allocation of prestige. But again, the treatment of history in the volume favours explanations founded upon diachrony (as in the seasonal oscillation of activities) or, at best, post-contact changes in residence and population drawn from patrol reports and aerial photographs, over any more complex understanding of historical process. There is an unwillingness to address indigenous accounts or representations of the past that is surprising given the reputation of this community of ethnographers for attention to indigenous exegesis of symbolism.

The writing of history by archaeologists in the Highlands, even less of a topic for debate than it is amongst ethnographers, subscribes to much the same set of "Western" or "evolutionist" assumptions. Golson (1977c:18), albeit in a public lecture, has suggested that in

half the time that an agricultural economy has been practised in New Guinea, societies in other parts of the world developed such leadership, and some passed beyond to the creation of the type of society we call civilization. It is possible that, given time and if left to themselves, some New Guinea societies would tread at least part way along this path.

Golson then qualified this proposition by adding that it 'may well be, however, that the path they have so far trodden is a real evolutionary alternative', but his use of the term "path", and his confirmation of the similarity between the archaeological evidence from Kuk and more recent ethnographic models of social evolution in the Highlands (1990:145) suggest an acceptance of the "internal evolutionism" of Modjeska and Feil. Thus Golson and Gardner refer to agricultural intensification and political integration amongst the Dani of the Baliem valley as 'the apogee ... in the Highlands overall' (1990:409), and relate changes over time in axe-production to current regional variation in strategy: 'at one period all groups would have been like Eastern Highlanders of recent times.' (1990:404). The general criticism of such writing that needs to be made is that no groups have ever been 'like' the Eastern Highlanders of recent times, other than in individual details such as pig-person ratios abstracted from the wider social and cultural contexts which give those very details meaning.

There are other problems that are peculiar to the archaeological writing of history: these have to do with issues of agency and scale, and their expression in the use of archaeological evidence and the deployment of analogies. The difficult task of integrating "social" and "environmental" factors in historical explanation has already been raised in Chapter A.1. If agency is to be reserved to self-conscious subjects and denied to "natural" phenomena (Johnson 1984:218), then in writing history we must be vigorous in maintaining the distinction between explanations founded on "cause" - factors such as environmental change - and those that reflect "meaning" - the

23. Most surprising was Kelly's admission, in a footnote (1988:175, n.3), that the Etoro had suffered losses, in epidemics, of between 50 and 55 percent of their population between 1935 and 1968. While he contended that this had not altered per capita pig holdings within a limited part of the Etoro territory (a curious recourse to the materialist position), the resultant decline in social networks was surely of more significance, particularly given the thrust of his argument on the importance of social density and exchange.
intentionality of agents (Gardner 1989). Golson seeks to explain change at Kuk in terms of environmental factors, but writes of change in terms of the decisions of social groups, effectively offering narratives of cause masquerading as narratives of meaning. It is important to view this distinction not as one of scale but rather as a difference in perspective. An environmental explanation of the phases at Kuk is adequate as such, as an explanation of the role played by environmental change, land degradation and the introduction of new species. But this is not history, where the subject of history is accepted to be human society. What we require is an understanding or a model of intentionality and of social process. The dilemma this poses for archaeology is one of scale: how do we detect human decisions on a scale appropriate to the capacity for resolution of archaeological techniques?

It is hard to disagree when Gorecki (1986:163), commenting on the interlude between Phases 1 and 2 at Kuk, observes that it, 'took 3,000 years for people to come back to Kuk plantation, a time-span long enough for improvements to have occurred in wetland cultivation techniques'. The difficulty of conceiving of the scope for social or technological change over such a span of time is common to most archaeological writing, but especially poignant when discussing a single site with a relatively restricted range of functional possibility. The enigma of Kuk is that it represents a negative image, as it were, of changes in Wahgi society that are likely to have occurred largely beyond the physical boundaries of the site itself.

In his interpretation of Kuk, Golson employs a model of "analogical distance" in which the strength of an analogy is held to decrease with increasing temporal distance from the baseline of contact:

indicators of continuity between the archaeological and the ethnographic situations, together with the short time span separating the end of one and the beginning of the other, inspired confidence in using the evidence from New Guinea ethnography to interpret the latest phase, Phase 6, at Kuk swamp.

Golson (1990:141)

Analogies drawn from post-contact Wahgi society are in fact held to be applicable to Phases 4, 5 and 6, but not to Phases 1, 2 or 3 (1990:143,145). This creates an awkward distinction between the earlier phases, for which explanations continue to rest on environmental change, and the latter phases which are interpreted in the light of ethnographic analogies: Phase 4, which witnesses 'the genesis of Wahgi society as known ethnographically' (Bayliss-Smith and Golson 1992b:23) serves as the marker between these two contrasting domains of explanation.

Golson has identified a significant problem for archaeologists using analogies, but are we to accept that the role of society in the creation of the archaeological record at Kuk somehow diminishes between Phases 4 and 3? Much of this thesis is devoted to addressing questions of the validity of inferences drawn from ethnographic analogies and I restrict myself here to observing that the theory of knowledge sketched in Chapter A1, which regards history, in the sense of "what really happened", as essentially unknowable, has the effect of freeing us from the hopeless task of locating analogues that match up to the requirements of a "concrete" past. Rather, our analogues should be a means of raising further questions about the past by simultaneously extending and refining our understanding of what, given certain criteria, is both possible and probable. This, I would argue, is a model for history writing more generally.
APPENDIX A2

A CHRONOLOGICAL BIBLIOGRAPHY OF GOLSON'S WRITINGS ON KUK

In addressing the historical development of Jack Golson's thought and writings on Kuk, it is often necessary to distinguish between the date at which a paper was written and the date of its subsequent publication. This bibliography lists Golson's published and unpublished writings on Kuk in the chronological order in which they were written. The first date given is the year in which the draft paper was largely completed, the second the year in which the paper was published. Comments in bold at the end of each entry are drawn from annotations made by Golson (JG) to an original draft of this bibliography. Except where otherwise indicated, all papers are authored by Golson alone. A near-complete list of Golson's published works in chronological order of publication is also available (Anon. 1993).

1966

1966 'Prehistoric research in Melanesia.' Ms. 52pp.

1968

'Archaeological prospects for Melanesia.' In Y.K.Sinoto (eds.) Prehistoric Culture in Oceania: a symposium. Honolulu: B.P.Bishop Museum, pp 3-14. [Written in 1966 for the 1966 X Pacific Science Congress in Tokyo, with the addendum (pp.11-12) added in 1967 to the much-delayed galleys close to publication]

1967


1970

1970 'A hydraulic civilisation in the Wahgi Valley.' Seminar paper, RSPacS, ANU. Ms. 17pp.

1973


1974


1975


1976b

1977d  'No room at the top: agricultural intensification in the New Guinea Highlands.' In J. Allen, J. Golson and R. Jones (eds.) 
Sunda and Sahul : prehistoric studies in Southeast Asia, Melanesia and Australia, London : Academic Press, pp 601-638. (Written in 1975 for XII Pacific Science Congress, 
Vancouver, then rewritten for publication in 1976)

Golson, J. and P.J.Hughes

1976  'The appearance of plant and animal domestication in New Guinea.' In J. Garanger (ed.) La Préhistoire Océanienne, Paris: 
Centre de la Recherche Scientifique, pp.88-100. {Written for, 
and published in, a preprinted volume for the IX Congress 
of the International Union of Pre- and Protohistoric 
Sciences at Nice in 1976 - thus probably late in 1975, or 
early in 1976}

Golson, J. and P.J.Hughes

{Unrevised version of Golson and Hughes 1976 paper}

1977b   'The making of the New Guinea Highlands.' In J.H. Winslow 
ed.) The Melanesian Environment: change and development, 
Canberra : ANU Press, pp.45-56. {Written in 1975 for the 
Waigani Seminar in May 1975. All of the text, bar the 
addendum which was added close to publication, was 
rewritten in the first half of 1976.}

1976e   'Archaeological investigations at Kuk Tea Research Station, 
Mount Hagen: an enquiry into the agricultural history of the 
New Guinea Highlands.' Ms. 4pp.

1976c   'The history of the sweet potato in the New Guinea Highlands.' 
Ms. 34pp. {Written for H.E. Maude's festschrift but 
withdrawn because of the considerations set out in Golson 
1977b:54-55}

1976a   'The last 10,000 years in the New Guinea Highlands and 
beyond.' Ms. 8pp. {Revised version of 1977b}

1977c   'The Ladder of Social Evolution: archaeology and the bottom 
rungs.' Australian Academy of the Humanities. Proceedings 
Unviersity. {Written in the first half of 1977}

Henderson, K.

1977   'Ditches before time.' Hemisphere 21(2): 13-21. [Interview 
with Golson and Philip Hughes]

1980b   'The Ipomoean revolution revisited: society and the sweet 
potato in the Upper Wahgi Valley.' In A. Strathern (ed.) 
Inequality in New Guinea Highlands Societies, Cambridge: 
Cambridge University Press, pp.109-136. {Initially developed 
from a seminar given to the Anthropology Department at 
Cambridge in 1978 and then reworked over 1979 and 
1980}


1980 'The Kuk Project.' Australian Quaternary Newsletter 15: 13-18. {Republished as Golson 1980/81}


1983 1984 'A proposal to proclaim a historic site at Kuk agricultural research station, Mount Hagen, Western Highlands Province.' Ms. 10pp. {A note in the Department Annual Report for 1983 states that this was submitted in 1983. Stems from correspondence in June and July 1982 initiated by the National Museum Director, Geoffrey Mosuwadaga which Philip Hughes and JG then discussed with Western Highlands Provincial Government officials in October 1982}

1984 Golson, J. and A.Steensberg


1987 1987 'New Guinea agriculture.' Natuni 6: 16-17. [Interview with Golson]

1989 Golson, J. and D.S.Gardner


Bayliss-Smith, T.P. and J.Golson
1992a 'A Colocasian revolution in the New Guinea Highlands? Insights from Phase 4 at Kuk.' Archaeology in Oceania 27(1):1-21. {T.P.B-S and JG worked on the basic data in Canberra in April 1990. T.P.B-S wrote the framework of the article in August 1990 and JG added his input late that year in the light of Golson and Gardner 1990 which had then appeared in print}

Bayliss-Smith, T.P. and J.Golson
1992b 'Wetland agriculture in New Guinea Highlands prehistory.' In B.Coles (ed.) The Wetland Revolution in Prehistory: proceedings of a conference held by The Prehistoric Society and WARP at the University of Exeter April 1991, Exeter: WARP and The Prehistoric Society, pp.15-27. {As for 1992b, but this article then produced largely by T.P.B-S}
<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Title</th>
<th>Source</th>
<th>Note</th>
</tr>
</thead>
</table>
APPENDIX A3

DATING THE TIBITO AND OLGBOLI ASH FALLS

The Tibito and Olgboli tephras, material deposited in volcanic ash showers, have played a crucial role in Highlands archaeology as chronological markers during the period of the last 1200 years. Blong (1982) describes the history of their discovery in association with the Kuk archaeological project (Section A2.2) and proposes criteria for their identification in the field, together with more accurate methods of chemical characterization.

On the basis of his chemical "fingerprinting" analysis, Blong has identified Long Island, off the north coast of New Guinea (Figure A4) as the most likely source for both the Tibito and Olgboli tephras. Radiocarbon dates bracketing each of the tephras have enabled Blong to propose a pooled mean date for Tibito tephra of 230 ± 40 BP for and the range 1100 - 1200 BP for Olgboli.

Calibration of the 14C results bracketing Tibito tephra using the range of different calibration curves then available yielded a scatter of corrections between 270 cal BP and 420 cal BP (Blong 1982:192). Through his analysis of the historical records from European ships passing Long Island between the 17th and 19th centuries, Blong concluded that the most likely period for the eruption that produced Tibito tephra was between 1630 AD and 1670 AD, though he could not rule out the possibility of a date at any point in the eighteenth century (1982:193).

Haberle (1994) has recently reviewed the radiocarbon evidence for the dating of Tibito and Olgboli tephras. On the basis of his analysis and using the most recent calibration program (CALIB 3.0.3; Stuiver and Reimer 1993a, 1993b; see Appendix C11), Haberle assigns a pooled mean age of 1188 ± 45 BP to Olgboli tephra, which calibration constrains within the period 1190 BP - 970 BP (980 AD - 770 AD). The pooled mean age of 232 ± 28 BP for Tibito tephra yields a calibrated age of 305 BP - 260 BP (1645 AD - 1680 AD). These calibrated ranges are adopted in this thesis as the best current estimates for the dates of the Olgboli and Tibito tephras.
APPENDIX B1

A HISTORY OF CONTACT AND LIST OF NOTABLE EVENTS FOR THE TARI REGION

By most measures, including those of Huli history itself, the period of contact between Huli-speakers and the former colonial state was brief. Two broad phases in this period leading up to the establishment of the independent state of Papua New Guinea in 1975 are distinguished for the Tari region: an "early colonial" period from 1934 to 1945 and a "late colonial" period from 1950 to 1975. The events of "first contact" between Huli-speakers and European mining prospectors, so precious to colonial accounts of the history of the Papua New Guinea Highlands, were both shocking and incomprehensible to most Huli eyewitnesses: the two Fox brothers, accompanied by sixteen armed carriers, crossed Huli territory from west to east during two weeks in November 1934, killing more than forty-five Huli as they passed (Ballard and Allen 1991, Ballard 1992b). No Huli has suggested to me that there was any knowledge of whites or of the colonial state prior to 1934. There is similarly no evidence, prior to 1934, for the trade of steel goods or other "European" materials into the Tari region. The first sightings of airplanes and the subsequent passage through the Tari region of at least nine administration patrols between 1935 and 1945 provoked considerable interest but, other than introducing new crops and the first steel tools, induced little immediate change in the lives of most Huli. Small numbers of Huli men were employed by patrol officers as carriers and guides during this period and were thus introduced to the patrol posts at Lake Kutubu, Wabag and Mt Hagen.

A far more substantial impact was sustained through the spread of a series of epidemics during the 1940s, though no direct connection between these events and Europeans was established by Huli at the time. Of these, the most virulent was probably the dysentery epidemic (ti darama: "faeces-blood") of 1945/46. People alive at the time describe the appalling casualties sustained in the major basins, an impression borne out by the testimony of genealogies from this period:

Some time after the whites (honebi) came to Hoyabia [1938], there was a great sickness, ti darama, which killed "a thousand" people in Haeapugua alone. But people didn't fight each other, as everyone could see that all were affected in the same way. There had been no big sicknesses before this, so everyone just stayed where they were.

Togoli, 19.10.89, Interview Notes

Other epidemic events during this period, known as moge and tiwa moge, are remembered and named for the sores (moge) that erupted on people's bodies. Major epidemics of porcine anthrax (nogo kekenekene), which may have been present in Tari earlier, also claimed a heavy toll amongst Huli pigs during the same period.

After a five-year lapse in administration contact, government officers from Lake Kutubu began patrolling Huli territory again from 1950, ultimately establishing the first permanent patrol post and airstrip among Huli-speakers at Rumurumu (Tari) in 1952. This permanent government presence marked a major watershed in Huli colonial history; where patrols had previously been content to observe wars without interfering, the intention of the administration to bring the region under control was clearly signalled by the immediate intervention of an armed patrol in a war at Haeapugua. 1952 also marked the arrival of the first missionaries, and within four years of the establishment of Tari station, four different missions had staked claims to distinct areas within the immediate Tari area, to be followed by a further two new missions in the Koroba area.

1. These missions included (in order of their establishment) the Methodist Overseas Mission (later United Church) at Hoyabia in 1952, the Unevangelized Fields Mission (later Asia-Pacific Christian Mission, later Evangelical Church of Papua) at Halenguali in 1952/53, the Capuchin Roman Catholics at Gubari in
The administration initiated an ambitious road- and bridge-building programme, extending control to the Komo and Koroba areas and supervising the mass migration of Huli men as labourers to coastal plantations under the Highlands Labour Scheme. Political autonomy was returned to the Tari region in a series of steps, with Local Government Councils set up in 1964, National Independence in 1975, and a Provincial Government for the Southern Highlands in 1978; Huli political leaders have been active in all three bodies. Three of the more significant developments of recent years have been the widespread adoption of a cash economy, substantially fuelled through the profits of small coffee-holder production; the completion in 1981 of the Highlands Highway link to Tari from the provincial capital at Mendi, the first widely available means of access to the rest of the country; and the minerals exploration and exploitation boom of the late 1980s and 1990s. This last phenomenon, which includes the extraction of gas from the Hides field on the Gigira range, a major gold rush at Mt Kare to the north of the Tari basin, and the discovery of alluvial gold in most of the major Huli basins, appears likely to overshadow all other forms of "development" (Clark 1991, Ryan 1991, Vail 1991). The following list of "notable events", which I have compiled for the demographic program at the Tari Research Unit, provides a bald chronology for the Tari region during the twentieth century.

1954/55, the Seventh Day Adventists at Habare in 1956, the Christian Missions in Many Lands (CMML) at Gunu near Koroba in 1958 and the Wesleyan Mission at Fugwa (Mogoro) in 1961.
2. According to Glasse (in press:5), 34% of all adult Huli men migrated as labourers under the Scheme.
NOTABLE EVENTS LIST FOR THE TARI REGION

Dates have been determined from a combination of oral historical accounts, the sources listed below and a diary kept by John Vail of the Tari Research Unit (for the period 9.6.84 to 21.5.91). Question marks (?) denote entries for which the date is not independently verified and relies solely on oral historical evidence.

1912  ?Severe drought and frost
1914  ?Severe drought and frost
1922  19th Jan.: Major earthquake in Tari region at 10pm, epicentre at Bosavi (7.5 on Richter scale)
1925  ?Very severe drought, known to Huli as "Ambuamo"; major food shortage, with heavy mortality
1934  Sept.-Dec.: Minor drought
       Oct.: Airplane sent from Mt Hagen to find Fox brothers turns back over Margarima (and thus not seen in the Tari basin)
       Nov.: Fox brothers pass through from the Strickland river to Koroba, Puren, Dauli, Tigibi, Tari Gap, Margarima and then to Mendi; their party consisted of 2 Europeans, 16 armed carriers and no police or dogs.
       Hiwa vs. Telabo war in Haeapugua basin (after the passing of the Foxes)
1935  May: Hides/O'Malley patrol passes from Bosavi region to the Hegigio river, Benalia and then to Margarima through the Ne/Gereba pass; their party consisted of 2 Europeans, police, and carriers
       Severe wet period and ensuing famine, concluding in Feb. 1936
1936  1st Feb.: Aerial reconnaissance flight (seen in Dauli, Margarima and Haeapugua areas) (containing L.Lett, J.Hides, J.Taylor, P.E.Williams, I.Champion) passes from Tari Gap to Dauli and Yumu and returns along same route
1937  Lake Kutubu police post established
       Aug.-Sept.: C.Champion/Anderson patrol passes from North to South Basin and out to Kutubu (2 Europeans, police, carriers)
1938  Feb.-Mar.: I.Champion/Adamson patrol from Kutubu to Hulia river and back to Kutubu
       May-Jul.: Taylor/Black (Hagen-Sepik) patrol camps at Hoyabia; air drops made
       Heavy rains for 6 to 8 months, moderate food shortages
?Earthquake in Tari region
1939  Nov.-Dec.: I.Champion/Timperley patrol from Kutubu passes from Mananda to Hiwanda, Waleta, Hare, Karida, Eganda, Rumurumu, Bai, Yangali, Dagia valley and back to Kutubu (2 Europeans, 11 police, 37 carriers)
1940  June: Adamson patrol ex-Kutubu
       Kutubu station closed
1941  ?Severe drought with frosts and bushfires; Tagali river dries up completely; subsequent major food shortage extending into 1942, with heavy mortality
1943  Heavy rains in early 1943
       Sept.: D.J.Leahy patrol from Wabag to Hoyabia via Wage valley; Huli carriers taken to Mt Hagen
?Start of major porcine anthrax epidemic
1944  ?Large numbers of allied warplanes fly over Koroba and Tari from the south (very widely seen)
1945  Mara Gamu cult imported to Tari basin from Porgera
       Sept.: N.Blood patrol to Hoyabia to interrupt Mara Gamu cult and to return Huli carriers from Mt Hagen
       ?Heavy rains for 4 to 5 months; moderate food shortage
?Influenza, dysentery (ti darama) epidemics
1950  D.J.Clancy patrol from Lake Kutubu to Lower Tagali
1951  Smith/Clancy/Neville patrol from Lake Kutubu to the Tari basin in an abortive attempt to establish an airstrip and permanent post at "Rumurumu" (Tari)

1952  Carey/Neville patrol to Tari from Lake Kutubu; establishes permanent post and builds airstrip

Tani/Tigua war stopped

Sept./Oct.: M.Garlick and J. Erkkila of Unevangelized Fields Mission (later A.P.C.M., now E.C.P.) walk to Tari

Sept./Oct.: Methodist Overseas Mission (now U.C.) established at Hoyabia

1953  L.Twyman establishes A.P.C.M. base camp at Tari (Halenguini)

1954  Anthrax epidemic

First medical patrols in Tari and Haeapuaga basins

Oil patrol to Lebani and Strickland Gorge led by Clancy with Zehnder, Llewellyn and Duke; Huli carriers drown in Strickland river

3rd Mar.: Major earthquake near Tari, VII on Modified Mercalli scale of felt earthquakes

4th Mar.: Major earthquake near Tari, VI on Modified Mercalli scale of felt earthquakes

Sept.-Oct.: Minor food shortage

Mar.: Roman Catholic Mission established at Gubari

Apr.: R.Glasse starts ethnographic fieldwork at Hoyabia

Oct.-Nov.: Food in abundance

Nov.: Major earthquake at Tari, 6 on Richter scale

1956  Seventh Day Adventist Mission established at Habare

E.C.P. Tani Wailete mission initiated by Jim and Joan Erkkila (station formally established 1957)

May: Minor food shortage, Haeapuaga

Aug.-Sept.: Tagali river in flood

Nov.: R.Glasse completes first fieldwork visit

1957  Tagali Bridge completed by Berard Tomasetti and Neil Grant

Minor food shortage in Koroja area after heavy rains

20th Mar.: "Haibuga Marsh" and "Huriba" areas derestricted by Administration

1959  Anthrax epidemic

Pneumonia epidemic at Margarima

Sinclair replaced at Koroja by Desailly

June: R.Glasse begins second fieldwork visit

1960  Feb.: R.Glasse completes second fieldwork visit

Hiwanda - Tagali Bridge road completed

June?: Bushfires at Paijaka

5th Aug.: Full eclipse of the moon noted at Tari

Heavy rains, minor food shortage

1961  Heavy rains, minor food shortages

Full administrative control established

Andabe Kepa appointed as Member of the Legislative Council

D.P.I. introduces coffee

6th Sep.: Wesleyan Mission established at Fugwa

1962  Sept.: Minor frosts at Tari

Jan.: Influenza epidemic

4th Feb.: Full eclipse of the sun noted at Tari

Jun.: Measles epidemic

A.P.C.M. establish mission station at Mananda (Komo)

Nov.: Minor food shortage

1963  July: Food in abundance

1964  Local Government Council established at Tari

24th Apr.: Major earthquake near Tari, V-VI on Modified Mercalli scale of felt earthquakes

Apr.-May: Dysentery epidemic

National Elections
1965  Drought, minor food shortages, followed by good karuka pandanus harvest
1966  Benalia airstrip opens
1968  Ian and Betty Rowse are E.C.P. missionaries at Tani, Normans at Mananda, Sinclair's, Merriweathers and Erkiklas at Tari.
1971  National Elections
1971  2nd Feb.: Dauli Teacher's College opened.
1972  National Elections
1974  Severe frost and drought; minor food shortages
1974  Mar.: Christian revival movement ("Rebaibal") begins at Homa; one man, Pororo, killed
1975  E.C.P. print press established at Halenguali
1977  16th Sept.: National Independence for Papua New Guinea
1977  Mar.: L. Goldman begins ethnographic fieldwork at Yaluba
1977  S. Frankel begins ethnographic fieldwork at Hambuali.
1978  National Elections
1978  25th Aug.: Southern Highlands Provincial Government established at Mendi
1979  S. Frankel completes ethnographic fieldwork at Hambuali.
1979  May-Aug.: R. Glasser doing ethnographic fieldwork near Hoyabia
1980  Aug.: Southern Highlands Premier Andrew Andaija killed in plane crash at Tari Gap
1981  All-weather highway to Tari completed
1982  June: National Elections
1982  Jul.: Fighting at Tauanda - c.3 killed
1982  Sept.: Fighting at Iduwi, at least 3 killed
1982  July-Nov.: Severe frost and drought; minor food shortages
1983  First social clubs set up outside Tari station
1983  Sept.: Police station opened at Tari
1984  Tari station roads sealed
1984  2nd Feb.: Westpac open branch at Tari
1984  1st June: Excessive rain; minor food shortages
1985  Floods in Koroba
1985  28th Aug.: Payback killing at Telabo outside S.D.A. church
1985  12th Feb.: Hangabo war for two days
1985  26th Feb.: War between two Pureni clans - 2 men drowned in Tagali and speared in back
1986  Apr.: Idipu war (Pi vs Piribu at Andoware)
1986  17th May: Debi river in flood, Bai bridge covered, heavy silt deposits
1986  June: Yaungtine Koromba wins Southern Highlands Provincial Elections
1986  26th June: Piribu-Hambuali war
1986  11th Aug.: Ambua Lodge opens
1986  13th Nov.: Westpac branch at Tari closes
1987  Mar. C.R.A. start sampling at Mt Kare
1987  2nd Apr.: Prime Minister Wingti visits Tari
1987  28th Oct.: Tagali river in flood
1987  1st Nov.: Tumbe-Pureni war over death of Hambuali man
1987  6th Dec.: Tani-Pureni war
1987  21st Dec.: Haro-Dabada war
1987  9th Mar.: Komo war
1987  28th Mar.: Wingti and Chan visit Tari
1987  May: British Petroleum set up camp at Kobalu
1987  8th July: Tari District Office burnt down after National Elections
1987  28th Aug.: Hadani-Pi war
1987  25th Sept.: Koroba war
1987  7th Oct.: Sullivan's wholesale tradestore opens at Tari
1987  31st Oct.: Hela Cultural Centre started
1987  31st Oct.: Funding for Tari Women's Guest House approved
1988  
12th Apr.: Halimbu-Waralo war  
Apr.: Mt Kare gold rush starts  
25th Apr.: Halengoali war  
16th June: Dauli Hydroelectric Station starts operating

1989  
4th Jan.: Gigidai I war  
26th Mar.: Hedemali war (over dispute at Kare goldrush)  
21st June: New District Office opened  
13th July: Barili-Yaguari war  
Sept.: Hail storm in Pi-Nagia area destroys crops; minor local food shortage

3rd Nov.: Wabia-Biango war

1990  
26th Apr.: Floods throughout Tari region  
Jun.: Albert Mogai wins Provincial elections

1991  
4th Mar.: Debi river in flood  
24th Apr.: Hides power line completed  
June-July: Heavy rains, floods cover Haeapugua and Dalipugua  
15th Aug.: Haeapugua floods completely

1992  
Telabo-Dumbiali war

1993  
June: National Elections, Wingti returned to power (takes office in July)  
25th Feb.: Heavy rains, floods cover Haeapugua  
Dobani-Hagu war  
Hoyapia-Piwa war  
Komo - major wars  
July: Major landslide in Puyaro area destroys settlements; no casualties reported  
20th Aug.: Major earthquake shock received at 3.05pm at Tari; District Office breaks in two, no fatalities.

**Sources:**

Adamson 1939/40; Anon. 1936/37; Ballard and Allen 1991; Blood 1946; Carey 1952; C.Champion 1937/38; I.Champion 1936, 1937/38, 1939/40; Clancy 1951/52; Fox n.d.a.; Glasse in press; Hides 1935; Leahy 1943; *Light and Life* (E.C.P.); A.Sinclair pers.comm.; *South Pacific Post* 19/9/61; Tari Patrol Reports: 3-54/55, 4-54/55, 6-55/56, 1-57/58, 1-58/59, 1-59/60, 7-59/60, 6-60/61, 8-60-61.
APPENDIX B2

A NOTE ON HULI ORTHOGRAPHY AND A GLOSSARY OF HULI TERMS USED IN THIS THESIS

I have attempted to render Huli phrases and terms according to the orthography employed in the language materials produced by the missionaries Murray and Joan Rule (W.M.Rule 1974, W. and J.Rule n.d.). There are other orthographies available for Huli, such as that proposed by Gabriel Lomas (1988) in his doctoral thesis on Huli language. But a large number of Huli are now literate in Huli and most are familiar with the standard orthography set out by the Rules which is the basis for a Huli-English dictionary (Huli Language Conference 1971) and a Huli translation of the New Testament.

Pronunciation of Huli terms differs most notably from English in the following instances:

<table>
<thead>
<tr>
<th>Huli letter</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a, i, e, o, u</td>
<td>Nasalised vowels</td>
</tr>
<tr>
<td>h</td>
<td>More heavily frictionised than the English equivalent</td>
</tr>
<tr>
<td>y</td>
<td>Pronounced with friction (approximating a soft English &quot;j&quot;) except between e-a or o-a vowels or after a nasalized vowel (and here also, after &quot;ai&quot;)</td>
</tr>
</tbody>
</table>

Huli is a tonal language, with three distinct tone patterns: a high falling tone (\), a level mid tone and a low rising tone (/) (the tonal notations given here follow Goldman (1983) in reversing the slopes initially given by the Rules). While these tones are critical in speech, with tonal differences giving rise to entirely different meanings for the same lexeme, context is usually sufficient to identify the sense of a word in text unmarked by tone. Consequently, tones are not marked in the text here, other than for contrasting pairs where the distinction is of critical importance, as between aba ("father") and aba ("mother's brother, affine").

The major point of difference between the standard orthography and that used here relates to composite words where one of the vowels is elided, which are spelt here in full; hence eganda becomes either egaanda ("bird nest") or egeanda ("cave"), and gebali becomes gebsali.

The following glossary lists short translations for the Huli terms employed in the text of the thesis. More complete lists are given elsewhere for Huli terms for soils (Table B3), grasses (Appendix B3), trees (Appendix B4), crops (Appendix B7), fauna (Appendix B8), birds (Appendix B9), leaders (Table B19), stone axe blades (Table C4) and ritual stones (Table C5); these terms are not repeated in this glossary.
aba - mother's brother, affines
aba - father
ababuni - father's brother
abi - form of compensation payment
agali - man
agali haguene - head man
agandi - man's house (see also balamanda)
agau wandia - rite performed for human fertility in dindi gamu ritual
ajnya - mother or those that one's mother calls 'sister'
ala - early, ancient, prior
anda - house (ungendered); private area
andaga - home, homewards
angi - time
angibuni - sow
aria - cognatic kindred
are - flaked stone piece
ayu - now
ayu - axe
ba - to kill, to sacrifice, to hit
baile - relative(s)
balamanda - men's house
bamba - before
baya horo - mythical cannibal giant
bayabaya - sacrificial role in Huli ritual (see dindi bayabaya)
bì - speech, talk
bì bái - in between / tied between, describing individuals with links to both of two lineages
bì laga - orator
bì tene - speaker, "source" of the talk
da pindu - "sky stuff", an alternate term for mbingi
da togo - "sky bridge", route of the sun
daba - generation
dabu - form of compensation payment
dama - spirit, either ancestral or unrelated
dama angi - era of the spirits (see also ira goba naga)
dama dindi tene - original earth spirit
damba bì - speech form, often incorporating dindi malu, delivered by agali haguene
damene - cognatic kindred
dandayi - policeman ("bow-bearer")
dange - cowrie shell
dange hende - rope of cowrie shells
darama - blood
dé gana - shallow internal ditches marking garden plot boundaries
deba - rite in the tege ritual sequence
dindi - land, earth, soil
dindi aba - land owner
dindi anduane - land owner
dindi bayabaya - former fertility rite
dindi dumbidumbi - earthquake
dindi gamu - a complex of former rituals ("earth spells")
dindi hameigini - parish territory (see hameigini II)
dindi kuni - original territory
dindi malu - clan or;gin myths and genealogies
dindi pongone (ne) - the root of the earth
dindi pongoyi - ritual leader knowledgeable about the root of the earth
dindi tene - land owner
dìnini - ghost, spirit of recently deceased
dodo - dirt, polluting substances
domboki - stomach, middle
dombeniali - middle man, mediator
dugu - row (as of vines)
duguba - a cardinal orientation towards the south
Duguba - peoples of the Papuan Plateau
duna - a cardinal orientation towards the west and northwest
Duna - Duna-speaking people
e - swidden garden
e ma - swidden taro garden (ancestral)
ega - rite in the tege ritual sequence
emene - small
gabu - dry, dead
gabua - wild
gae - drought
gae timbuni - major drought
gamu - spell
gamuyi - spell-holder
gamugamit - spells
gana - ditch
gebe - ancestor (see also mama); also ancestor-focused ritual
gebe anduane - sponsor of gebe ritual performance
gebe hagama - rite performed at Gelote mimicking the lifestyle of the earliest ancestress
gebe nogo - pigs sacrificed for ancestors
gebeal - ancestor or ritual leader
gebeanda - ancestral ritual site
gewa - cane, component of dindi pongone
gomia - early ritual form and associated dance style
guruanda - long house associated with tege rituals
guruma igiri - young male initiates in tege rituals
habane - egg, core, centre
habe - life (contrasted with homa)
hama - public forum, open space
hameigini - agnostic clan or lineage, a descent construct
hameigini - parish territory, parish co-residents
hana - moon (see Hona Hana)
hane - front, facade, entrance end of house
hari - mountain, sky
hari or bambali hari - walkway, track
haroal - male bachelor cult member (see also ibagiya)
haroal tigi - bachelor cult grove
hege - swear word
Hela tene - origins of Hela people (Huli, Duna et al.)
hewa - non-Hela people (Foi, Fasu, Hewa); also a cardinal orientation towards the southeast
heyogone - youngest, junior
himu - rite in the tege ritual sequence
hina - sweet potato
hina angi - era of sweet potato, modern era
hina gari - famine, shortage of sweet potato
hina naga - era of sweet potato, modern era
homa - death (contrasted with habe)
homa haguene - rite performed for ancestral skulls
homama - cold, sickness
homogo - rich man or woman
Hona Hana - moon (see hana)
Hona Ni - sun (see ni)
honebi - light-hued, European
hugu - vaginal fluid
huli or hulihi - Huli-speaker, also a cardinal orientation towards the southern Tari basin
huli ore - the southern Tari basin, "real Huli"
iba - water
iba dama - severe rain
iba kuyama - deep pool, usually a ritual site
iba li - flood
iba puni - drainage ditch or channel
iba tiri - male water spirit; also rubbish man (of humans)
ibagiya - male bachelor cult member (see also haroalt)
ibane - grease
ilili - taboo, ritual proscription
ira - wood, tree, fire
ira dugu - rotten wood, buried swamp forest, associated with early dama
ira goba naga - era of the spirits (see also dama angi)
irabu - forest
kai - praise
kai mini - praise term
kamiana - ancestral ritual site (often a cave)
keba - digging stick
ko - bad
kuni - bone
liru - ritual stones
liruali - ritual leader associated with liru ritual; also senior officiant at tege ritual
liruanda - building containing liru ritual stones
ma - taro
ma angi - time or era of taro, preceding modern period of sweet potato
ma gari - taro famine, ancestral famine
ma hiraga - ritual performed for infants
ma lara - wetland taro garden (ancestral)
ma naga - time or era of taro, preceding modern period of sweet potato
ma uli - taro hole
mabu or mbabu - permanent garden
mabu anduane - garden owner
mabu tene - garden owner
mago - filthy, disabled
malu - genealogy
mama or mamali - ancestor
mana - custom, knowledge, lore
manayi - individual knowledgeable about mana
mane or maneme - headwaters; a cardinal orientation, generally towards the north and north-east
mbagua - mineral oil
mbagua yole - tigaso tree oil
mbi - darkness
mbi dindi - Tibito tephra ("darkness sand")
mbi mu - Tibito tephra ("darkness sand")
mbingi - time of darkness; refers specifically to the Tibito volcanic ash fall
moge - a boil, sickness
mondo - mound
mu - sand
muguni - trace, evidence, mark
nabaile - non-relative(s)
ngoe - earthworm
ngu - taint (of women)
ni - down there
ni - sun (see Hona Ni)
i doma - rainbow ("sun bridge")
i habane - rounded stone used in ritual ("egg of the sun")
i tangi - stone mortar used in ritual ("hat of the sun")
nogo - pig
nogoanda - pig hut
nogo dugudugu - pig droveway
nogo (bara) tambugua -
nu - string bag, placenta
oali - local, person of this place
obena - a cardinal orientation towards the north-east and east
Obena - Enga-speaking people
pabe - fence
panamondo - small mound
pibiya - frost
pindu - thing, stuff
pipini - breast milk
pobo - heat, female pollution
pugua - menstrual blood
pugua - swamp
puni - channel, stream
pureromo - adage, formal saying
puya - snake
tara - other, non-cognate
tayaanda - forest
tee - grove
tee (Enga) - major form of ceremonial exchange practiced by Enga-speakers
tegge or tegge pulu - recent ritual complex
tegge anduane - sponsor of tegge ritual
tegge bi - ritual speech appropriate for performances of tegge
tegge tene - sponsor of tegge ritual
tene - agnatic parish resident
tene hamene - cognatic parish resident with a long history of local residence by ancestors
tene te - origin myth
ti darama - dysentery ("shit blood")
timbuni - big, large
 timu - form of compensation payment
tolg - stone
tomia - poison
tomo - food
urtali - junior officiant at tegge ritual
uru wagia hale - torch employed in dindi gamu ritual
wabi or wabwabi - lowlands, generally a cardinal orientation towards the south and southeast
wahene - eldest
wai - war
wai biaga - war leader
wai tene - individual responsible for a war and for associated reparations ("war source")
wali - woman
wali haga - non-cognatic parish resident
walia - mark, trace, evidence
wandari - girl, young woman
wandia - woman's house
wane - daughter
wane labo - female water spirit
wariabu - brideprice
yabo - early form of ritual
yagibano - poor, worthless
yagogo - haze
yamuwini - non-agnatic parish resident ("placed by woman")
APPENDIX B3

HULI TERMS FOR GRASSES, SEDGES, MOSSES, FERNS AND SHRUBS

This list provides Huli terms and species identifications for some of the more common grasses, sedges, mosses, ferns and shrubs of the Tari region. Formal species identifications are based largely on the work of Powell, Wood and Haberle; the primary contribution of this list is an attempt to render the Huli terms according to the standard orthography (Appendix B2). Variations in the spelling of Huli terms given by different authors are provided, where these differ from the standard orthography. Individual Huli terms are often applied to a number of different scientific species; where known, these different species are listed, with the species most commonly identified by the Huli term listed first.

Conventions:

[bardu] synonyms
(POTO) alternative spellings from other sources

Source abbreviations:

d Huli Language Conference (1971)
f Frankel (1986)
g Goldman (1981a), (1983)
h Haberle (1991)
p Powell with Harrison (1982)
w Wood (1984)

Generic terms:

malingi - fern
tani / datani - grass / weed
gama - moss

Specific terms:

adiba gadiba - unidentified grass sp.
agibaba - Cyathea atrox (grassland tree fern) (d)
alibali - Echinochloa crus-galli / Eleusine indica
amolo - Marattia novoguineensis
andaguru / andagulu - unidentified grass sp.
andugubali - Hoya sp. (p/ANDUKUBALI)
angigali - Saccharum spontaneum
angugani - Saccharum robustum
aulai - Helichrysum bracteatum / Xyris capensis (w/AULEI)
ayambu - Flagellaria indica (d)
babeya - unidentified fern sp.
bandu - Coix gigantea; Hagen pitpit [hongo bandu]
baya - Holochlamys sp. (p/PATIA)
bodo - Merinthosorus hieronymii / Drynaria sp. / Microsorium commutatum / Aelaomorpha drynariodes (p.h/POTO)
bolange / bolage - Ischaemum polystachyum / I. timorenses (p/PORLAKE, h/PORLAGE)

var. mindibi
var. bebe
dabale - Xanthomyrus sp.
dagi - Gleichenia milnei
dambale giao - Plectranthus scutellarioides (p/TAMPALAKIAN, w/DAMBALEGEAO)
dambe - Euphorbia buxoides / Machaerina rubiginosa (p/TAMBE)
 dangi - Imperata cy.indica (p/TANGI)
debedebe - Polygonum spp. / Pouzolzia sp. / Altermanthera sessilis / Gonostegia hirta (w,p,h/TEBETEBE)
degware - Viola arcuata (g)
dibiribi - Dennstaedtia sp / Sphaerostephanos unitis / Cyclosurus unitis
didibali - Tephrosia sp. / Desmodium sequax (d) (p/TITIBALI)
dibugandu - Claoxyylon sp. (d)
diwi - Wikstroemia androsaemifolia (p/ITWI)
dombda - Piper sp. (d)
duguba aduba - Erechtites valerianifolia / Crassocephalum crepidioides [mbua mbua]
dunduyame - Leersia hexandra / Isachne globosa/arfakensis (h/TUNDIYAME, p/TUNDIYEMA)
elene - unidentified grass sp.
gabutugu / gabitugu - Cyathea sp. / Dicksonia hieronymi
gambali - Blumea a-nakidophora/lacera (p/KAMVARI)
gambe - Miscanthus floridulus
  var. angibali
  var. angiyali
  var. angundali
  var. igibali
  var. ingiyali
  var. kolo
  var. wabiale
ganga / kiangu - Elatostema blechnoides/beccarii / Procris sp. / Dichroa febrifuga / Pilea effusa/melastomoides (p/KANGA)
garegare - Impatiens hawkeri / Ophirhiza nervosa / Plectranthus scutellarioides / Pogostemon stellatus / Pilea sp. (p,h/KAREKARE, d/KARAKARA)
gebe tani - Paspalum conjugatum / Polygonum chinense / Drymaria cordata (p/KEBITANE, KAPITANE, w/KEBITANE)
gigibaya / gigipaya - Scleria ciliaris / Carex sp. / Schoenus sp. / Cyperus sp. / Dianella ensafolia / Ghania sieberiana / Fuirena umbellata (p/KIKIPATIA)
gilinapu / gilinaba - Geitonoplesium eymosum
giroallemame - Rhododendron macgregoriae (p/GIRINILAMA, w/GIRALEMAME)
gombabu - Kyllinga brevifolia/melanoperma (p/KOMBAPU)
  var. hende gombabu
gonalia puhaga - Sacciolepis myosuroides
gonalia tani - Setaria montana
gondale / goandale - Urena lobata (h/KONDALE)
gondo - Commelina paleata/diffusa / Floscopia scandens (d/GONDU, p/KONDO)
guoyubugunu - Alpinia sp (p/KWOYUBUKUNU, w/KUOYUBUKUNU)
gurubu - unidentified grass sp.
hamanoma / hamanoma - Eleusine indica
hangabo - Cyathoa senofilia / Phyllanthus flaviflorus [malingi?]
hawaiia - Schoenopectus mucronatus / Lipocarpha chinensis
hewaliabu - unidentified purple daisy sp.
hina pole - Siegesbeckia orientalis (p/HINAPALA)
hombre - unidentified grass sp.
hongo bandu - Coix gigantea [bandu]
hura - Eleocharis dulcis [tare]
ibendenge - unidentified moss sp.
igibu - Calamus sp.
kanekane - unidentified grass sp.
kuabu - Celastrus novoguineensis
kuheko? - Frecycinetia sp. (p)
kulina - unidentified vine sp. (d)
lobolobo / loboloba - Bidens pilosus / Dichrocephala bicolor / Siegesbeckia orientalis / Drymaria cordata (h/LOPALOA)
mabua - Schizomeria sp.
madai / madau - Ludwigia octavalvis (w/MADAI, p/MADAING, h/MATAU, MATANG)
malingi - Cyathea aenifolia / Phyllanthus flaviflorus [hangabo?]
mangara - Sauraulia sp. (d)
manunani - unidentified vine sp. (d)
magu - Solanum torvoideum (p/MARGU)
mbombera - unidentified grass sp. (d/BOMERA)
mbuambua - Erechtites valerianifolia / Crassocephalum crepidioides [duguba aduba] (w/BUAMBUA)
nabiyu - unidentified sp.
nengalo - Pycreus unioloides
ngolo - Miscanthus florumulus
nigi - Laportea sp. (p.w/NEGI)
nogo biniwa - Lycopodium sp. (p/NOKOBIWIA)
nogo hane - Sacciolepis indica (p/NOKOHANE)
nogo iba - Ageratum conyzoides / Adenostemma hirsutum / Eupatorium odoratum / Siegesbeckia orientalis / Orthosiphon sp / Plectranthus sp.
(t/NOGO IBA LOBA LOBA, p/NOGOIPA)
nogo pindu miaga - unidentified sp. [= nogo tau miaga?]
nogo tau miaga - Polygonum nepalense [= nogo pindu miaga?]
nogombi tani - Hediyotis lapevrousii / Lycopodium sp. (p/NOGOBITANA)
obena mandiyame - unidentified grass sp.
padu - unidentified sp.; Huli pitpit
palaway - Helianthus annuus?; Sunflower
palima - Melastoma sp. (d)
pani - unidentified vine sp. (d)
paula - Acorus calamus (p/PAWLA)
pimbí tani - Polygonum nepalense / Isachne brassii / Dimeria ciliata / Digitaria violascens / Setaria montana / Sacciolepis sp. (p/PIMBITANE)

var. mindibi - Sacciolepis myosuroides

piwa - Equisetum debile
poro - Dimorphanthera sp. / Rhododendron sp. (d)
pu - Medinilla sp. (p/PUU)
tabayia - Smithia sensitiva / Aeschinomone indica (p/TATATIA)
tare - Eleocharis dulcis [hura]
tere tani - Lactuca laevigata / Bidens pilosus (p/TERETANE)
tibu / tibunali - Alpinia sp.
tola - Phragmites karka
tongole - unidentified sp.
toro - Nephrolepis acuminata
tugubuli - Frecycinetia sp. (p/TUGBULLI)
wagamabu - Embelia sp. / Blumea sp. / Cissus aristata (p/WAKAMAPU, WAGAMAPU)
wandiyan? - Erigeron sumatrensis (w) [= obena mandiyame?]
wango/wangoli / wango - Sauraulia sp.?
yagua - Pteridium aquilinum / Diplopterygium sp. / Histiopteris incisa
yu - Cyclosorus sp.
APPENDIX B4

HULI TERMS FOR TREES

This list provides Huli terms and species identifications for some of the more common trees of the Tari region. Formal species identifications are based largely on the work of Powell, Wood and Haberle; the primary contribution of this list is an attempt to render the Huli terms according to the standard orthography (Appendix B2). Variations in the spelling of Huli terms given by different authors are provided, where these differ from the standard orthography. Individual Huli terms are often applied to a number of different scientific species; where known, these different species are listed, with the species most commonly identified by the Huli term listed first.

Conventions:

{bibi ayaga} kai mini praise term
[embo] synonyms
(p/AYEG) alternative spellings from other sources

Source abbreviations:

d Huli Language Conference (1971)
f Franke: (1986)
g Goldman (1981a), (1983)
h Haberle (1991)
hr Holdsworth and Rali (1989)
p Powell with Harrison (1982)
w Wood (1984)

Generic terms:

ira - tree
yuni / duni - leaf

Specific terms:

abare {mau walo} - Pandanus conoides; Marita pandanus
agarugua - Planchonella sp.
aia - Planchonella sp.
aiange - Ficus sp. / Streblus sp. (p/ALIENGE)
alulina - unidentified tree sp.
alugui - unidentified tree sp.
andir - Nothofagus sp.
ang a {doro wale} - Pandanus julianetti; Karuka pandanus
anona - unidentified tree sp (d)
apona? - Rapanca sp. (p)
ayaga / ayage (aidege in Koroba area) {bibi ayaga} - Areca sp.; Black palm
(p/AJAGA, g/AYEGE)
ayoba - Libocedrus papuana
bai - Castanopsis acuminatissima; Oak (p/PAI)
bai werira - Symplocos sp. (p/PAIWERIRIA, w/BAIBURIRI,
d/PAIWERIDPAUTIDI)
bailimu - Melastoma affine (w.f/BALIMA)
bara - Euodia latifolia / Evodiaella cauliflora (p/PARA)
bauwa / bauwa - Casuarina oligodon (p,h,w/PAWA,d/POAWA)
bebogo - Macaranga warburgiana (p/PEBEKO)
bogaboro - Astronia sp.
dagialo / dagilagu - Dicronopteris linearis (h/TAGILAGU)
dagiruba - Nothofagus sp.; Southern beech
dego / degua - Elaeocarpus sp.
deya - Trimenia papuan (p/DIJER,DIER,d/DANIA)
dobeya - Octamyrthus behmannii (d)
dombe - Octamyrthus sp. / Sapium sp.
dugu liwa - Dacrydium nidulum; Swamp pine
dumbi - Elaeocarpus sp.
egemaria - Timonius sp. / Guettardella sp. (p/EKAMARIA)
eli - Octamyrthus pleiotetala / Planchonella sp. (p/ERI)
embo - Homalanthus novoguineensis/nervosus (g) (d/IMBO) [momage]
emo - Gordonia papuan
eno - unidentified tree sp.
ere - Octamyrthus pleiotetala/fruticasum
gabi - unidentified tree sp. (g)
gaea - unidentified tree sp.
galoma - Alphitonia incana (p/KALOMA)
gambara - Syzygium sp. (p/KAMBARA)
gana - Phyllocadus hypophyllus
gato - unidentified tree sp.
gebo / gibi - Myristica sp. / Podocarpus sp. / Horsfieldia spicata (p/KEBO,KEPOKANA)

gedere - Pandanus sp.; Wild pandanus sp. (p/KETERE)
gendegende - Talauima oreadum / Magnolia candollii (leaf of this is gingali?)
gerebaya - Carpodeacus arboeaceus (p,h/KEBEUYA)
gibaro - Gardenia sp. / Ficus sp. (p/KIBARO)
gingali - Elaeocarpus sp. (w/KINGALI)
gore - Pandanus sp.; Wild pandanus sp.
gubaro - Saurauia congestiflora
gubi - Dysoxylum sp?
gugu - Pandanus sp.; Wild pandanus sp. (h/KUGU)
guhabia - Memecylon hepaticum (w/NGUABI)
gulina - unidentified sp.
gumu - Litsea sp. (d)
guraya / guriya {gubiraya} - Araucaria cunninghamii
habe - unidentified tree sp.
habeno - Conandrium polyanthum / Rapanca acuminatifolia
habia - Schefflera sp. (p/AVIA)
habono - Eurya sp. / Ardisia sp.
hagohago - Blumea riparia / Ficus sp.
hajo - Ficus pungens (p/HIYO)
harapira - unidentified tree sp.
hale - Elmerillia sp.
harege / hartiago - unidentified tree sp. (g)
haro - Lithocarpus nago-villosus (p/ARO)
hebare - Alstonia glabiflora (p/HEPALI)
hembolome - Prunus grisea var. grisea (p/HEMBOLEME)
hewe - Quintinia nutaniiflora / Memecylon torricellense (p/HEWA)
hiliwa - Macaranga pleiostomena/pleionura (p/HILUWE)
hiribi - Ficus adenosperma
hiwa - Metroxylon sagu; Sago tree
hql - unidentified tree sp.
homa - Polvosma sp.
homai - Timonius spp. (h/HOMIA)
homai {yuwi} - Pandanus brosimos; Wild pandanus [muniya]
hubi - Ficus calopilia (hr) (p/HUPI,d/UBI)
hungi - Piper gibbillum (p,h/HUGI)
var. *hungi haruli* - *Piper macropiper* (p/HUNGIHALULI)

*ibi gobe* - *Prunus pullei* (w/IBI KOBE)
*idama* - *Cyathea rigens*
*ingidi* - unidentified tree sp.
*kepopuni?* - *Riedelia monticola* (p)
*ketene* - unidentified tree sp.
*kiabu* - *Podocarpus bracteatus* (p/KEBU, d/KIBI)
*kuandi* - *Calcluvia brassii/celebica* (d/GONDI)
*kuangia* - *Sloanea* sp. (h/KWANGIA, w/KUONGIA)
*kueda* - unidentified tree sp.
*lai* - *Dodonaea viscosa*
*laulaul* - *Medinilla sp.* / *Eria sp.* / *Rhododendron* sp. (p/LAULO)
*lelenge* - *Pandanus* sp. (*brosimos*?); Wild pandanus sp. (p/ILINGE)
*londo* - *Pandanus* sp.
*mandalo* - *Cupaniopsis macropetala* / *Alectryon* sp. (p/MANDARO, w/MANDOLO)
*mandara* - *Graptophyllum pictum* / *Dichroa febrifuga*

var. *baoni* (p/MANDARA-BAU)
var. *deledele*

*mandi* - *Acalypha* sp. / *Macaranga* sp.
*maugu* - *Harmiopanax aculeata* (d)
*mbada* - *Euodia latifolia* / *Gunnera macrophylla* (p/BATU)
*mbuli* - *Glochidion poriferum* / *Ilex arnhemensis* (p,w,h/BULI)
*mehago* - *Primus piperita*
*meria* - *Cinnamomum eletmensii*
*mindira* - *Gymnostoma papuana* [formerly *Casuarina papuana*] (w,p/MINDIRIA, d/MINDIYA)
*momage* - *Homalanthus novoguineensis* [embo]
*mugu* - *Garcinia dulcis* (Roxb.) Kurz
*mundiya* (yuwi) - *Pandanus brosimos*; Wild pandanus (w/MUNDIA, h/HULIMUNDIA) [homa]
*nagira* - *Eurya* sp. (p/NAGIRI, d/NAGIA)
*nano* - *Ilex* sp.
*ngoatagiaagia* - unidentified tree sp.
*nguai mano* - unidentified tree sp. (g)
*ngubibi* - *Dysoxylum variable* (h/GUPIPI, p/GUPI-VI)
*ogobura* - *Schuurmansia henningssii* (d/OBBO, h/OKOBURA)
*pa* - *Maesa bismarckiana* (p/PAR)
*pagu* - unidentified tree sp.
*palamba* - unidentified fir sp. (d) [baraba / ayaba]
*pele / peleda* - *Vaccinium* sp. / *Styphelia suaveolens* (h,p/PELETE, d/PELA)
*pendene* - *Neuburgia* sp.
*perege* - *Pittosporum* sp.
*pilibu* - unidentified tree sp.
*pini* - *Dacrycarpus expansus*
*poge* - *Ficus copiosa*; Fig (p/POKE, FORKE, h/PORGE)

var. *dendene*
var. *manguni / maguni*

*pogepoge* - *Ficus wassa*; Wild fig (h/PORGEPORGE)
*puliwa* - unidentified tree sp.
*punguna tone?* - *Fagraea* sp. (p)
*tabayia* - *Albizia fulva/falcata*
*taja* - *Trimenia papuana* / *Debregeasia* sp. (p/TAER)
*tawa* - *Pandanus antaresensis*
*teletele* - *Breynia* sp. / *Phyllanthus* sp. (p/TELITELI)
tibabo - Platea excelsa / Cryptocarya sp.
tondo - Broussonetia papyrifera; Mulberry
tugu - Dacrydium nidulum
ubua - Solenospermum sp.
uruloba / urunu / uruwaba - Wendlandia paniculata (p/URUNA)
wabara - Flindersia sp.
wagara - Saurauia sp.
wali - Garcinia spp.
walu - Celtis sp. / Garcinia spp.
wangoma / wangama - Saurauia sp. / Psychotria sp.
yagombe dibu - unidentified tree sp.
yaluba - Araucaria hunsteinii
yulutima / yuludima - Amyema strongylophllum / Henslowia sp./ Decaisnina hollrungii (w,p/YURIDIMA, d/YULADIMA)
APPENDIX B5

DETAILS OF HULI SACRED GEOGRAPHY

This appendix expands upon the short account of the "root of the earth" (dindi pongone) given in B2.6. Details of the exact line of the two routes of dindi pongone between each of the major gebeanda are commonly known and said to be matched in each case by a sacred river which flows upstream from southwest to northeast. These rivers are known most commonly as Tade and Girabo. A short section of one of the sacred rivers, the Girabo, runs (mostly upstream) along the following route between the gebeanda sites at Bebealia Puni and Mbibi Baite, beginning as the Dogayu river, which flows through the vast natural tunnel that constitutes the site of Bebealia Puni; from there it becomes the rivers Bume and Deme in the Yaluba valley, then the Girabo river at the Gelote gebeanda, before plunging beneath Haeapugua swamp, surfacing briefly in the swamp's centre at Habodaya lake and then at the eastern margin of the swamp at Abago, where it enters under Lagali ridge and emerges again as the Wada river in the Tari basin.

The easternmost of the two routes of dindi pongone is initiated at a site known to Huli as Malayia (Frankel 1986:20) or Malea (Allen and Frankel 1991:97), which may correspond to the Onabasulu ritual site of Malayia. Malayia may be the site visited and mapped by Frankel (1986:20), though an ethnographer of the neighbouring Kaluli suggests that there are two sites of the same name, the more significant of which has not yet been located precisely (E.Schieffelin pers.comm.). The approximate location given on my map for Malayia reflects that plotted by Schieffelin (1991: Map 5).

This eastern root extends from Dangi Tene to Hari Hibira, amongst bilingual Onabasulu/Huli speakers south of Komo, and then under the Lower Tagali river to Bebenite in the southern part of the Tari basin, before ending at the Tuandaga site amongst bilingual Huli/Enga speakers. The western route has its origins at the spectacular site of Bebealia Puni, where the Dogayu or Baia river plunges into a natural tunnel. From here, the root runs beneath the Gigira range to Gelote, on the Pureni side of Haeapugua basin, and then through the Paijaka plateau to the high-altitude site of Tai Yundiga and on to its terminus amongst Paiela-speakers at Mbibi Baite.

There are alternative interpretations of this portion of dindi pongone amongst Huli as well as their ethnographers. Yet there have been other regenerative ritual projects also associated with dindi pongone but founded on totally different cosmogonic myths. The major alternative cosmogonies trace the origins of the universe to different margins of Huli territory, including the Bebealia Puni site to the south and the site known to Huli as Hewari Gambeyan, on the Pori river, amongst Duna-speakers. Other ritual networks are similarly available, including the nogo bara tambugua routes which link the gebeanda a: Irari and Gelote to ritual sites in Duna, and beyond to Oksapmin (N.Haley pers.comm. and N.Modjeska pers.comm.), and the baya horo track which runs from the Lebani valley towards Ambua (L.Goldman pers.comm.). These alternatives are not unrelated to dindi pongone, in intention or in symbolic detail, but none provides the apparent unity of purpose or geographic extent evident for dindi pongone, at least from the perspective of Huli. It is sufficient to note here, however, that Huli sacred geography comprised a multitude of strands and levels of understanding and that its presence was evident throughout the Huli landscape.
APPENDIX B6

HULI CLANS AND GENEALOGIES

The documentation of genealogies was perhaps the most time-consuming of field tasks, but it was an undertaking that was necessary in order to understand both Huli history, in its detail, and Huli historicity - the way that Huli conceive of and reproduce the past. Genealogies were documented for some 98 Huli clans; these varied in detail from single lines for a clan to attempts, as for Tani and Dobani clans at Haeapugua, to identify as many agnates (tene) and non-agnatic cognates (yamiiwini), living and dead, as possible. This appendix briefly describes the nature of Huli naming and genealogical practices in order to provide a background to the use of genealogies and clan names in reconstructing the history of land ownership and land use at Haeapugua (described in Part C) and the histories of migration (summarized in Chapter D1). Details of Huli kinship are provided by Frankel (1986) and Goldman (1983, 1988) and in Chapter B3 of this thesis.

Clan Names, Praise Terms, Patronymics and Matronymics

An understanding of the dispersed nature of Huli residence and the practice of multiresidence requires consideration of the ways in which Huli themselves identify clans and clan agnates. Table 2 of this appendix is a list of clans whose members speak Huli either as a first language or equally with another language. 244 clans are listed but, on the basis of the areas such as the Pajjaka plateau which I have not visited, I would estimate that there are as many as 300 Huli clans for which tene agnates are still recognised. The clans are listed alphabetically, with three other types of name which correspond to each clan: kai mini or nogo mini praise terms, agnatic patronyms and agnatic "matronymics". The list is incomplete and provisional and I would welcome any further corrections or corrections.

Kai mini ("praise name") or nogo mini ("pig name") terms are those employed in formal contexts and narratives to identify specific clans (and, in rare instances, all or both of the clans of smaller phratries); in Narratives C2, C3 and C4, for example, clans are referred to as often by their kai mini as by their clan names. Ideally kai mini terms are composed of two lexemes. In the simplest forms, the first of these is the clan patronym and the second the clan name; most kai mini, however, employ neither source and consist instead of terms whose origins are not immediately obvious but which often refer to historic individuals or events associated with the clan. There is no substitute for specific knowledge of the correspondence between clan and kai mini names. Most adult Huli men and women know the kai mini for most of the clans represented in their immediate area or basin.

Agnatic patronyms serve to distinguish the clan in which an individual is agnate, irrespective of his or her parish of residence. Both men and women are accorded patronyms, though there is an element of respect implicit in the use of a patronym and younger men and women are not generally acknowledged in this way. Patronyms are sometimes clan-specific, but are more often shared by all or most of the clans of a phratry (see Table B5). Following Frankel (1986), I have distinguished patronyms in the text by inserting a hyphen between the patronym and an individual's proper name; hence Hubi-Morali is an agnate from Bai clan (where the patronym is Hubi-) whose proper name is Morali.

Agnatic "matronymics" have not previously been described and are an obscure

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1. Glasse (1987) has previously published a list of 77 'parish agnate surnames' (patronymics); our lists differ on matters of orthography but are essentially in agreement. More fundamental differences of opinion with Glasse over the significance of patronyms and the nature of Huli social structure are discussed in Chapter B3.
category which I was able to distinguish only through comparison of a wide number of
genealogies. Strictly speaking, these terms are not matronymics though, in some
instances, they appear to function similarly to agnatic patronyms: for example, the
woman Nano, an agnate from Tani clan, is often referred to as Taya-Nano (see Gen.2
below), using the "matronym" associated with her agnatic clan. More commonly, a
consistent pattern emerges in genealogies whereby many of those female agnates of a
clan through whom significant consanguineal relationships are established with other
clans are identified by the same name. In Tani clan and in the other clans of Yari
phratry, most female agnates identified at more than five or six generations above the
present generation are known simply as "Taya"; specific examples of Taya are given in
Gen.1, where the sister of Doromo and Hewago is said to have been the first women
thus identified, and in the genealogies for Tani Doromo (Gen.2), Tani Hewago (Gen.3)
and Hiwa (another clan of Yari phratry) (Gen.5). Similarly, women who married into
Tani clan were formerly known not by name but by their agnatic "matronym"; a
woman from Dagabua clan married to a Tani man would thus be known to her Tani
descendants as "Buria". The process of uncovering and confirming these "matronymics"
requires detailed genealogical work within each clan and, as a consequence, only a few
of these "matronymics" are listed.

Genealogies

Huli genealogies (malu) are unusual, within a Highlands context, for their depth,
breadth and level of detail. Most genealogies that seek to describe the full depth of a
clan's history from the earliest dama ancestors through to living individuals range
between 12 and 20 generations (daba) in depth; in rare instances, I have recorded
genealogies of 21 or 22 generations and, in one exceptional instance, a genealogy of 30
generations. The public recitation of genealogies was formerly restricted to formal
occasions such as disputes where the senior man of a lineage would describe a single
line of descent, usually linking himself to a dama ancestor.

Genealogies are typically composed of two distinct types of being: dama spirits
and agali humans. The first three to five generations of most clan genealogies consist
of individuals described as dama, to whom the social sanctions in force in "modern"
Huli society did not apparently apply. In many, but by no means all clans, the first
dama took the form of an animal, such as a cassowary, pig or dog. Subsequently, a
named individual is usually identified as the first human in the genealogy; the boundary
between humans and dama is described as dama agalila tu ("spirit-human-together-
boundary"). In some clans (as for Yari phratry in Gen.1), one or two individuals are
described as being half human and half dama (dama agali).

The exceptional depth of Huli genealogies is matched by the ability of most Huli
to trace complex kin connections "laterally". The importance of consanguineal aba kin
and the significance of the principle of precedence, both described in Chapter B3,
render these connections, both amongst the living and in the deeper past, highly
important in daily Huli life. Consequently, there is a significant emphasis in Huli
genealogies on the ability to recall not just "vertical" sequences of descent but "lateral"
sequences of marriage, siblingship and birth order. In order to exploit the cognatic
possibilities of Huli residence, most Huli retain a keen sense of the genealogies not just
of their agnatic lineage but also of as many of the clans with which they are affinally
linked as they can remember or deem important. At any public dispute, therefore, the
recitation of a genealogy will be closely monitored by a wide range of individuals with
different agnatic identities.

2. Goldman (1983:62) suggests the following etymology for the term malu ("genealogy"): ma ("before,
ancestor") + lu ("long").
3. Goldman provides a transcript account of one such formal delivery of a genealogy (1983:133) and
Goldman (1988:89-90) has suggested that genealogies are subject to artificial lengthening, particularly in the context of disputes over land where precedence greatly strengthens claims to land. As he has earlier suggested (1983:121), however, this form of invention of tradition is largely restricted to the *dama* section of genealogies where, as he and Frankel (1986:48) have both pointed out, there is greater scope for inconsistency of recall. *Dama* sections of genealogies are critical in asserting claims to land and in establishing the nature of relationships with other clans in the present; they do not generally display the degree of "lateral" elaboration which is demonstrated for the human sections.

**Genealogical Estimation (GE)**

My assumption is that the laterally elaborated human sections of Huli genealogies are, if not entirely accurate reconstructions of the past, at least sufficiently consistent internally to allow the generation of a form of relative chronology. The key to this chronology is the identification of specific individuals from different clans or lineages in narratives about historic wars (*wai tene*). Estimates of the dates of birth of a range of individuals named in association with a particular historical event almost invariably tally closely enough for them to have been contemporaries as adults.

It is necessary to make a number of assumptions, specific to Huli society, about the ages of men and women at significant moments, such as first marriage or the birth of a first child. These lifespan models are set out in Table 1 of this appendix. Huli men formerly married later in life than men of many other Highlands societies, reflecting the degree to which men's anxiety about female pollution was inculcated through the *haroali* bachelor cult. The comment is frequently made that it was a matter of pride and appropriate behaviour for a man not to marry until he had observed the first white hairs in his beard. Birth spacing, through the observance of post-partum tabus, appears to have been in the order of four to five years for a woman.

The considerably less elaborate model of the lifespan of a historical Huli woman reflects the limited role played by women in male conceptions of society, both now and in the past. As in the genealogies which these lifespan models address, women feature in corporate historical narratives largely as wives, mothers and daughters, and are seldom identified by their individual names. Indeed, the emergence of the form of "matronym" describe above reflects the practice of referring to married women not by their proper names but through the use of teknonyms, as "mother-of-X".

Estimates of the age of a historical individual proceed from an estimate of the date of birth of a living descendant, usually the narrator; where birth dates are given for living people, they are distinguished by the prefix "B" (e.g. B: 1954). By cross-referencing a number of different stages of an individual's lifespan with the dates listed in Appendix B1, it usually possible to estimate the date of birth of a living individual to within two or three years; these Estimated Birthdates are given as "EB: 1930". If a man, born in 1930, is the first-born son of a first wife, his father's age in 1930 is assumed to be 35 and this father's birthdate is then estimated to be 1895: where the estimate of the date of birth of a deceased person is made indirectly through a living relative, it is given as a Genealogically Estimated Birthdate (GEB). In some cases, where there is little scope for cross-checking with other genealogical lines of access, a range of possibility is expressed that allows for the birth of a first-born child when the father is between 30 and 40; with each generation, this range of possibility expands by a further five years in each direction. The prefixes "B", "EB" and "GEB" thus denote a scale of decreasing confidence in the date thus identified. Specific dates for events such as wars that have been derived through the process of genealogical estimation are prefixed by a question mark (e.g. ?1855).

Where the level of detail in the genealogical material permits, this Genealogical Estimate (GE) can be narrowed down. Knowledge of birth-order (including dead
infants and childless siblings) is often held and allows for adjustments to be made where an individual is known, for example, to be the second-born child of a first wife. A gross assumption that men were unlikely to amass sufficient bridewealth after a first marriage to take a second wife within five years allows for further estimates to be made, for example, for the third-born child of a man's second wife.

This process of genealogical estimation is necessarily crude, but it does allow for an independent test of the internal consistency of Huli genealogies, either where several individuals identified as protagonists in the same war are traced from different sources, or where the same individual is traced through a number of different lines of genealogical access. The results of this form of testing are encouraging, as the attempts to date specific wars and wetland reclamation events suggest (see Appendices C3, C4 and C6). The chronological accuracy of the method is obviously debatable, and susceptible to increasing error with increasing temporal depth, but it is considerably more accurate, at least over the last two centuries, than radiocarbon results, which carry a minimal range of 100 years at a single standard deviation.
APPENDIX B6, TABLE 1

GENEALOGICAL LIFESPAN MODELS FOR HULI MEN AND WOMEN

Male:

0-7  Living with female relative in *wandia*

7+  Living with male relative in *balamanda*

16  Starts to grow hair for wig

18  Enters *karoali* bachelor cult

20  Attains *karoali* status

25-30  First marriage

30-35  First child

  Second marriage

35-40  Second child from first wife

  First child from second wife

  Third marriage

40-45  Third child from first wife

  Second child from second wife

  First child from third wife

  Fourth marriage, etc.

60  Last possible child

70-75  Maximum possible age (rare)

Female:

0-20  Living with female relatives in *wandia*

15  First marriage

20  First child

25  Second child

30  Third child, etc

45  Last possible child

70-75  Maximum possible age (rare)
### APPENDIX B6, TABLE 2

**PRAISE NAMES, PATRONYMCS AND MATRONYMCS FOR HULI CLANS**

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<tr>
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<th>Patronym</th>
<th>Matronym</th>
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<td>HARI</td>
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<td>BAI URA</td>
<td>PIWA</td>
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<td>DABURA</td>
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<tr>
<td>Clan</td>
<td>Kai mini</td>
<td>Patronym</td>
<td>Matronym</td>
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<td>HULU WANDU</td>
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<td>GAU WANGA</td>
<td>PALI</td>
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<td>OBA WARA</td>
<td>GABIA</td>
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<td>PALI WAWI?</td>
<td>LAGI</td>
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<td>WENANI</td>
<td>KAI BELE</td>
<td>ABU</td>
<td>WENA</td>
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<td>BAU WAYA</td>
<td>BARU</td>
<td>PAWAPURI</td>
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<td>TUGU GEWAI</td>
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<td>UNGU YABE</td>
<td>BARU</td>
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<td>MAIYA</td>
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<td>YUMU</td>
<td>PIRI PINDU</td>
<td>BARI</td>
<td>GILIBU</td>
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Gen.2  Tani Doromo genealogy
Gen. 3  Tani Hewagc genealogy
Gen.4  Dobani clan genealogy
Gen 5  Hiwa clan genealogy
APPENDIX B7

CROP SPECIES AND CULTIVARS OF THE TARI REGION

This list provides Huli terms and species identifications for the more common crops found in the Tari region. Formal species identifications are based largely on the work of Powell, Wood, Rose and Haberle. The primary goals of this list are to extend the range of cultivar terms and to attempt to render the Huli terms according to the standard orthography (Appendix B2). The compilation of ethnobotanic terms by Haberle (1991), which incorporates an earlier field draft of this list, illustrates the extent of duplication of Huli terms through difference in orthography: variations in the spelling of Huli terms given by different authors are provided here, where these differ from the standard orthography. Species or cultivar terms not confirmed by my own enquiries are denoted by a question mark.

Conventions:

{kundu aluba} kai mini praise term
{mogia} synonyms
(p/ARUWA) alternative spellings as per above source

Source abbreviations:

d Huli Language Conference (1971)
f Frankel (1986)
h Haberle (1991)
p Powell with Harrison (1982)
r Rose (1982)
w Wood (1984)

Abare {mau walo} - Pandanus conoides - Marita pandanus

andaya
gabr (p/KABU)
gandumia / gandum (p/KADOMEA)
gogoba (p/KOKOPA)
kende (p/KENDI)
kuyu
mundu hagua (p/MUNDU) [tuabo]
nagua
nguimu
piyu (p/PIYU)
tili? (p)
tuabo [mundu hagua]
yubi (p/TUBI)

Aluba {hundu aluba} - Amaranthus spp. - Amaranth spinach (p/ARUWA)

giliaba
hundu bulua
lai (p/LAILUBA)
mbudugu (p/BUTAIJA,BUTUKU)

var. hoseni
var. mindini
uruloba (p/LOBLOB-BA) - *Amaranthus ?bidentata*

**Amolo** - *Marattia novoguineensis* - Fern

**Anga {doro wale}** - *Pandanus julianettii* - Karuka pandanus

Locations where variety term is recognised:

- [h] - Haeapugua
- [p] - Paiyaka
- [l] - Lebani

- *andirerai* (d)
- *ayugualu* (d)
- *dabali / debali* (d)
- *dagura? [l] (h)*
- *dejo [p,l] (r/TENYON, h/DAIO)*
- *gebeali [h,p,l] (p/KEPALI, r/KEBALI)*
- *gebo*
- *giliigi (d)*
- *guru / gurugu / guru / nenege [h,p,l] (d/KURUGU, h/KURUKU) (wild species?)*

- *habanda*
- *hagalia? [l] (h)*
- *hagirara [h,p,l] (p/HAGIRARE)*
- *hagua [h]*
- *henga [h,p,l] (p/HENGE)*
- *herega? [l] (h)*
- *hinanana [l] (h)*
- *hiru [h,l] (p/HERU)*
- *homagalibe [p]*
- *honde [p]*
- *hungua? [l] (h)*
- *kai [p,l]*
- *kakanabe [h,l] (p,h/KAKANAPE)*
- *kane (h/KARNE)*
- *kaule (d)*
- *kauru [l] (d) (h/KARUA)*
- *kerage (d)*
- *mabu [p,l]*
- *mandalo*
- *marako? [l] (h)*
- *mimu [l]*
- *ngaoi [h,p,l] (d/NGUELI)*
- *nguale [h,p,l] (= ngaoi?) (h/UNGUALI)*
- *padua [h,p,l] (p/PÁTUA)*
- *pari*
- *tabuna / tabuwa hende [h,p,l]*
- *tolo [p]*
- *tumbi [p]*
- *ugitiigibi? [l] (h) (possibly ugu tigibi - *Oenanthe javanica)*
- *urira [l] (h/URIDIA, UURI)*
- *walia? [l] (h)*
- *yagada (d)*

**Aniani** - *Allium ceca* - Onion

**Aniani** - *Allium ceca var. aggregatum* - Shallot
Auwa \{gaya auwa / auwa ogoea\} - *Rorippa* spp. - Crucifer spinach

`auwa auwa` (p/AWA)
`auwa ibitira` (p/AWA IBILIDIA, w/AWA ABALIDIA) - *Cardamine hirsuta*

*Babeya* - Unidentified fern (p/PAPEYA)

*Bambo* - *Cucumis sativus* - Cucumber

*Bambuli / Bambogini* - *Cucurbita moschata* - Pumpkin

karoyali

*Be* - *Bambusa vulgaris* - Bamboo (w/PE, p/PER)

`bene` (p/PENA)
`bindi` (w/PINDI)
gobi? (p)
haraya
kayamba
male
pongone
tegelabo (p/TAGALAPO)
tiribi? (p)
tola (p/TORA)
wala dogo (p/WALATOGO)

*Dalo / Lamba* - *Xanthosoma sagittifolium* - Chinese taro

*Damado* - *Lycopersicon esculentum* - Tomato

*Du \{hiwa tege\}* - *Saccharum officinarum* - Sugarcane

`angabone`
`awa / awawa` (w/AWA NEIO)
danda
daramabi
igibu
kerere? (g)
pabea
pili? (g)
tagobe (w/TAROBE)
tiambu
wabena (w/WABENA NEPO)
yole (p/YURE, w/YORE)

kiabi? (p) - *Saccharum* sp. var.
hai? (p) - *Saccharum* sp. var.
gambagua - wild black sugarcane

*Egagiba* - *Phaseolus lunatus* - Lima bean (p/EKAKIPA)

*Gabidi* - *Brassica oleracea* - Head cabbage

*Gaugau / Pateta* - *Solanum tuberosum* - Irish potato

*Gereba \{uru gereba\}* - *Rungia klossii* - Acanth spinach

`da`
degondo
emola / emolo / lemola
giligilibi
hayama (p/HAJAMA) [mbalapaya]
laï
mbalapaya (p/BALAPAJA, w/BALFIA) [hayama]
mindibi
nogombi (p/NOKOMBI)
togayu (p/TCKAJU)

Gobi - Coffea arabica - Coffee

Gora - Brassica chinensis - Chinese cabbage

Habia - Abelmoschus manihot - Aibika (p/HAPIA)

honebi
mbalape
mindini
pele
tokatoka? (p)
tunitibi

Hai {habi waya} - Musa cvs. - Banana

Variants:

h  koneni
m  mindini
a  abai
b  tambone

abuma (short-fruited variety of tili aluya)
agali kope
"banana"

  var. tunagi (short fruit)

dagobe
dagua (p/DUGU)
dalima
dongoma (p/TOGOMA)
dugu
emolo? (d)
giabi (m,h,b) (p/KIABU)
gundubu
"hagen"
hagua
hangi
hogolo (m,h) (p/HOKOLO)
hohola? (p)
honda / hondo / hondoa (m,h)
iba wane / iba wati (p/IBUWARI)
lemoko? (p)
lemola [tidall]
maremare / miaramara (p/MARAMARA)
miago (a,m) (p/MIAKO)
"rabaul"
tarima (m,h)
tidali [lemola]
tigua / tigo (m,h)
tilli aluya
waya
wero

Wild species:

garo / garoa (p/KAROA)

**Hima - *Saccharum edule* - Lowland pipit**

**Hina (atu muguba) - *Ipomoea batatas* - Sweet potato**

abu hege (p/APUEKE)
adini / dere adini
aliga (p/ALIYA,OLIKA, w/ALEGE,ARIGA)
alugua / aroguai (p/AROKOI)
ambua / ambuapoya (d) (h/ABUAPORE)
angibu
auweri / aguari (h/AWUARI)
bagai / bagaya (p/PAKAI) [barabia, magaya, mogai]
barabia (p/PARABIA) [mogia, magaya, bagai]
bawa? (h)
beleya / biliraya (p/PELEYA)
benalia (h/PENALIA)
biyawe (h/PIYAYE)
biyu / bigu / piyu (h/PIU) [padua]
bo
dabero / daberedo (p/TAPORO)
dabura (w/DABUDA, p/TAPORO) [tigibi?, tugulu?]
dama hina (p/TAMAHINA) [gebe, mane]
dambali (h/TAMBALI)
dambera (h/TABERA)
dandayi (p/TANDAJE, w/TANDAYE)
daria / dalia (p/TARIA)
dudimani / dirimane [IBA]
digi / digima [MUGUBA]
dugi? (d)
dumbi / dunbi (p/TUNBI)
egahaba
gabutugu (p/KAPUTUKU) [= kabutuya?]
galobe
gangade (p/KAGATE)
gauve? (d)
gawe / gawa (p/KAWA, w/KAU)
gebe [dama, mane]
gewai igiri
giambu / gimbu (p/KIABU, h/KIEMBU)
gondoma / gondoma / gunduma (p,w/KUNDUMA)
gonimi / komini [= "okinawa"]
gonoma (h/KONOMA)
gora aqwa (p/GORO(WA)) [parima, mole]
habare? (w)
habia (p/HAFIA)[mara]
hagapuk? (p)
hai
halari? (d)
hangabo (p/HAGAPO)
harima
heme [kenekene?]
hene (p/HINI)
hewa? (w)
higi
hoyabia
huru nigidi (h/HURU)
tba [didiman]
irali / iba irai (p/IRALI)
tri
iri
iriwake
kabi / kabituya [= gabutugu?]
kaburng? (p)
kage? (h)
kalugo (h/KALUKU)
kandugu (p/KADUKA)
kauwa / kau
kayani / kayali (h/KAYENI)
kebuku? (h)
kenekene? (p)
kuli {gayawi kuli} (p/AKURI,KULI)
limbawi
lini
ma hina
maga (not magaya)
magai
magaya (h/MAKAYA, p/MAKAJIA) [bagai, mogia]
mame / mami (p/MEME) [mid, dama, gebe]
mamun
mandiyame / mandiyanda / mandigame / mandiyane (p/MUNDIGRAMAN)
mara / marai [habia]
mau / mauwe
nbala
redi [gebe, dama, mame]
minalu? (h)
mindi
mogia (p/MUKIA, h/MORKIA) [magaya, bagai]
mole (h/MORLE) [parima, gora awa]
muguba (p/MUKUPA) [digi]
munima? (w)
padar (p/PATARI?)
padua (p, w/PATUA) [biyu]
pango / pangu
parima [gora awa, mole]
pe
pitin? (p)
poro
putiri (p/PATARI,PUTIRI)
tebolopaia (p/TEPOLOPAYA)
tele
ir? (p)
tianobi / tenavi / tanibi
tigibi [dabura?, tugulu?] (p/TEKIP) 
tigoli
triri
tolo
tugulu [dabura?, tigibi?] (p/TUKULU)
ulula
undiaba / undiyabe / windiaba (p/UNDIAPA)
undubi
wamnun / waamuni
waralibagabua
windu? (p)
yangali
yapiya? (h)

Hiwa - Metroxylon sagu - Sago

Homa - Pueraria lobata - Kudzu

Homa bawi - Dioscorea sp.? / Pueraria sp.? (p/HOMA PAWI)

Homai / Mundiya {yuwi} - Pandanus brosimos (w/MUNDIA, h/HULIMUNDIA)

Hongo - Coix lachryma-jobi - Job's tears

dumbi / tumbi - dried and wrapped tobacco leaf
bambone
munduni
yuluba (p/TULUBA)

Ira Damado - Cyphomandra betacea - Tree tomato

Ira Hina - Manihot esculenta - Cassava

Ira Lumbi - generic term for wood fungus; species include:

ade - wood fungus sp.
alungi - wood fungus sp.
gobangia - brown wood fungus sp.
hororo - wood fungus sp.
hoia - wood fungus sp.
irigiyidi - wood fungus sp.
manda budi - wood fungus sp.
mandalu - wood fungus sp.

Karot - Daucus carota - Carrot

Kuni anga / Gunu anga / Dama anga - Zea mays - Corn

Ma {hubi gaea} - Colocasia esculenta - Taro

Colour variances:

[h] honeni
[m] mindini

abarapu [h,m] [kanekane?, gedere, belebele]
audua / ardua (p/ARTUA) [lamba?]
belbele [gedere, kanekane?]
belema [ira pungama]
bialgo (p/PIANGO)
bogaya
dabagua
dandayi [simbu]
dangalina (p/TANGALINA) [parambagua?, hubikundu?]
gaea (p/KAeya, h/KIAUA)
gedere (p/KETERE) [abarapu, belebele, kanekane?]
gihagua [gihe]
gihe / yia [h,m] (p/KIYE) [gihagua]
hewe [honagahiwa]
honagahiwa [hewe]
hubikundu (p/HUPIKUNDU) [parambagua?, dangalina?]
ira pungama [belema]
kanekane / keneke (p/KENAKENA) [abarapu?, gedere?, belebele?]
kindia? (h)
lagabe [h,m] (p/LAKAPA)
lamba [audua?]
mallama / maliam (not milima) (p/MALEMA)
mamalema
midi
milima / minima [h,m] (not maliama)
minima (not minima)
paike? (h)
parambagua [hubikundu?, dangalina?]
pimbi
simbu [dandayi]
tirima [h,m]
waliwali
uguabo
yade (found only in Duguba)

Wild taro species - ?Alocasia spp.:

andaguru
dale / tale (f/TALEMBARIA)
tumbu

Malingi / Hangabo? - Cyathea aeneifolia / Phyllanthus flaviflorus - Fern

Mamunali - Rubus rosifolius - Edible raspberry

Mamunani - Rubus moluccanus - Inedible raspberry

Mbada - Persea americana - Avocado

Mbagua / Mbaguai {mbagua ugumi} - Lagenaria siceraria - Gourd
(p/BAGWA,BAGWABE)

Cultivar terms refer to differences in gourd shape:

geruni
hewamu (p/HEWEMU)
nguimu
timuande (p/TIMUANDI)

Mburoyi - Passiflora edulis - Purple passionfruit

Muli - Citrus limon - Lemon

Muli - Citrus aurantifolia - Lime

Mundu {uru lumuni / uru mundu} - Nicotiana tabacum - Tobacco

Nandi {nandi gae} - Dioscorea alata - Yam

dequ (p/TEIA'U)
hade
gge (p/KAE)
gambepi (p/KAMBEPI)
gangade
pi habe
piyu (p/PIJU)
puya
tabi / tabayame

Nano - generic term for fungus; species include:

adai - edible fungus sp.
andidime - edible fungus sp.
andobe - fungus sp.
aredeme - edible fungus sp.
budi - mushroom sp.
dayabu - fungus sp.
hagaba - fungus sp.
heberolo - Polyporus arcularius; mushroom sp. (g)
kuabe - fungus sp.
malipungu - fungus sp.
mbalupe - fungus sp.
mgonani - mushroom sp.
ngoedali - Russula ?emetica; mushroom sp. (f)
umbe - mushroom sp.

Narabile - Nasturtium officinale - Watercress

Orens - Citrus sinensis - Orange tree

Paboro - ?Psophocarpus tetragonolobus - Winged bean

Paboro / Honebi paboro - Phaseolus vulgaris - Common bean

Painabo - Ananas comosus - Pineapple

Palena {palena garo / pongo wabe} - Zingiber officinale - Ginger (p/PARANA)

palena
pongorali (p/PONGARALI)

Payabu - Cordyline fruticosa - Cordyline (p/PAJEBU, w/PAYEBU)

beberaya
dago
daro
dawolene
demogo
denge
gayumba
gondoba
gulu
hagare
mbiyame
megu
piru
pongone
ruhiba
yogora
Pinat / Ngaludi - *Arachis hypogaea* - Peanut

Pisum sativum - Pea

Podama - *Acorus calamus* - Bog iris

Poge - *Ficus copiosa* - Fig (h/PORGE, p/FORKE, POKE)

   dendene
   maguni / manguni

Sili - *Capsicum frutescens* - Chili

Tiabu {goloba anguma} - *Setaria palmifolia* - Highland pitpit

   ayage (p/AJAKE)
   banguma (p/PANGUMA)

   var. honeni
   var. mindini

   bebohe [iriri?]
   domboga
   emberali (p/ENVALALI, EMBELALI)
   "hagen"
   huluanda (w/HURUANDA)
   iriri [bebohe?]
   mbu (w/BU) [ngui pongo?]
   ngui pongo (p/GUPONGO) [mbu?]
   pongone? (w)
   walena (p/WALENO, w/WELINA)

Tiama - *Artocarpus communis* - Breadfruit

Tigibi / Dabura {ugu tigibi} - *Oenanthe javanica* - Water dropwort / Javanese dropwort

   dugubaya (p/TUGPAJIA) [gurugayane]
   gurugayane [dugubaya]
   poroporo (wild variety, not planted)
   tei

Togo - *Sechium edule* - Choko

Wiru - *Lablab purpureus* - Hyacinth bean

Yu {mali wango} - *Cyclosorus* spp. / *Cyathea* spp. - Fern (p/JU)

   bere
   dibiribi?
   erebe
   nogo
   poregedu
   tambu
   tuma

   yu wango / wangoli / wangoma - *Sauraulia* sp.?
Glycine max - Soya bean
Solanum melongena - Eggplant
APPENDIX B8

FAUNA OF THE TARI REGION

This list provides a summary of identifications and possible identifications for the more common species of fauna in and around the Tari region. A particular debt is owed to Peter Dwyer for providing me with a copy of his unpublished list of Huli mammal terms collected at Komo (Dwyer 1992).

Conventions:

{wai puya} - kai mini (praise term)
{yanegali} - tayaanda tuha - "forest talk" term (L. and H.Goldman 1977)

Super-generic terms:

angibuni - all female animals and birds
ega {pudupudu} - birds

Class Mammalia:

Generic terms:

gabua - large wild animals
huru - (small?) rodents
hali - wallabies (including Macropus spp. and Thylagale spp., but probably not Dorcopsis spp.)
nogo - large domesticated animals
tia - possums, cuscus, maybe also large rats (Mallomys spp. and Hyomys goliath)

Domesticated animals:

biango / honebi biango {yanegali} - Canis familiaris; domestic dog
biango dudu - Canis familiaris; New Guinea wild dog
busi - Felis catus; cat
nogo {gu} - Sus scrofa vittatus x Sus celebensis; pig
    nogo angibuni {gu angini} - sow
    nogo tau - bcar
nogo gabua / nogo dangani - Sus scrofa vittatus x Sus celebensis; wild pig
honebi nogo - Sus scrofa; introduced pig breeds
(nogo) bulamakau - Bos taurus; cattle
(nogo) meme - Capra sp.; goat
(nogo) sibisibi - Ovis aries; sheep
(ega) kagaruk (also honebi ega / ega masin) - Gallus domesticus; chicken

Specific terms:

abai {urulumu aba' / gulu wabe} - Spilocuscus maculatus; Spotted Cuscus
andaya / tia andaya / humai {poboanda} - Dendrolagus dorianus notatus; Doria's Tree Kangaroo
angamariabe {hulu angamariabe} - unidentified rodent sp.
balana / balena - probably Pseudochirus forbesi; Painted Ringtail
bayawe - unidentified cuscus / possum / giant rat sp.
borere - Dasypurus albobruchus; Marsupial Cat / New Guinea Quoll
buri - probably Rattus virecundus; Slender Rat
daboru - unidentified bat sp., possibly Dobsonia moluccensis
dindi borage / dindi: pubu {yugumi porombe} - Zaglossus bruijini; Long-Beaked
Echidna
du maia / ugu maia (ugurmania) {nduindui} - unidentified bat sp., possibly also a
generic label for bats
ega gamia / dala gamia - unidentified bat sp., possibly Dobsonia moluccensis; Bare-Backed Fruit Bat, or Pteropus sp.
gumbani - unidentified bat sp.
haguanda {kenda} - Phalanger sericeus; Silky Cuscus, or possibly Phalanger
carmelitae; Mountain Cuscus
homage - unidentified possum sp.
horia {wabele} - Phalanger gymnotis / Strigocuscus gymnotis; Ground Cuscus
huru (huli huru) - large pre-contact mouse sp.
huru hingidi {pigi pogo} - Rattus exulans / Rattus steini; Small Spiny Rat
ibaria - unidentified mammal sp.
limbu - unidentified mammal sp.
lubendele - unidentified mammal sp. (= dele / ndele?)
luni - Echymipera kalubu; Spiny Echimipera (bandicoot)
nambya huru - small house mouse, recently introduced
ndele / dele - Petaurus sp.; Sugar Glider
pagane / pagana {ngaragali} - Uromys caudimaculatus; Mottle-Tailed Tree Rat
palena {hangarine kani} - unidentified possum sp.
pongorali - Dactylolsa trivirgata; Striped Possum, or possibly Dactylolosa palpator?; Long-Fingered Triok
poreya - unidentified mammal sp.
tanduia - unidentified mammal sp.
tegani - unidentified mammal sp.
tinago / tinage {momonagua} - possum sp.
toya - unidentified mammal sp.
tulubaya - unidentified mammal sp.

[Huli term not known] - Synconvecsteris / Macroglossus sp. - bat
[Huli term not known] - Nyctophilus sp. - bat
[Huli term not known] - Miniopterus sp. - bat

Class Insecta:

Generic terms:

{amiano} - generic forest talk term for all insects
damane / timanu / timanu - caterpillars, grubs and bugs
gamuni - spiders
gangade / gagate - snails
fone {diya mone} - wasps and bees
tede {pigi pogo} - fleas
uguruli / ugarili / uburili - ants

Specific terms:

alibi biaga - centipede sp.
alibi habo - centipede sp.
amua - grub
andabilo - beetle sp.
badaru - horse fly sp.
biri pabua - butterfly / moth sp.
bombo - cricket sp.
bungane - butterfly sp.
bunguna - house fly sp.
danilina - blue bottle fly sp.
dereparia / derebara dere - grasshopper sp.
diahorogere - cockroach sp.
dingi donge - sandfly sp. / mosquito sp.
emo - louse sp.
giligalo - waterbug sp.
gindi - leech sp.
gonalia - cricket sp. or beetle sp.
gonania - scorpion sp.
gowamana - stag beetle sp.
gulu hayare - snail sp.
gununu - humming beetle sp.
himi - maggot sp.
hinabibi {yagalogua} - mosquito sp.
hinagigi - mosquito sp.
ira mbombara - termite sp.
ira pubu - sago grub
karayake - cicada sp.
karayano - cicada sp.
kari yala - cicada sp.
kuia / kua - flea / louse sp.
manda pibiypibiyu / mando logayallogayu - cockroach spp.
nero - small beetle sp.
pagaya / pagohaya - grasshopper sp.
perange - beetle sp.
pupudira - wood bug sp.
tani / tamia / tania / teni - white ant sp.
tibugende - Mantodea sp.; praying mantis
tonge - grub sp.
wage - cicada sp.
wagumbi - dragonfly sp.
wayumbi - crab-shell spider sp.
yabo - wood borer sp.
yagiyari - stick insect sp.
yakundi - firefly sp.
yangora / yawadiri - large-winged green insect

Class Reptilia:

abagua / habagua - very large lizard / crocodile
dalaga - unspecified snake sp.
dalapari - unspecified snake sp.
daria {dawene daria} - unspecified snake sp.
diwa - death adder sp.
gau - unspecified snake sp.
guru ibia / guribia - crocodile sp. [also eel]
guru walt - unspecified lizard sp.
hingini {ara hingini} - unspecified snake sp.
lebage {guriya lebage} - unspecified snake sp.
nogombi {guriya nogombi} - unspecified snake sp.
puya {wai puya} - unspecified python sp.

[Huli term not known] - Lobulia elegans - skink sp.
[Huli term not known] - Lobulia stantiana - skink sp.
Class Amphibia:

Generic terms:

wayabu - eels
wena / iba wena - fish
yago - frogs

Specific terms:

aio - frog sp.
angalamu - crab/crayfish sp.
engo - frog sp.
gare / gara - frog sp. (brown)
gigiya - frog sp.
haia / haiya / haea - tadpole / frog
ibia {guru ibia} - eel sp.; probably Anguilla marmorata
kurara / guarere - frog sp.
luabi - frog sp.
mbola - frog sp. (small green frog)
mbu - frog sp.
mburumbara - tadpole
nge - frog sp.
payali - large fish sp. (either carp or rainbow trout?)
pereliba - frog sp.
tengode / tengoda - frog sp.
ya - green tree frog sp.

(huli) wena - Glossogobius Species 6 (G.Allen 1991:184-5); Twinspot goby
honeyb wena - Cyprinus carpio; Cantonese carp
wena harehe - scaled fish sp.

[Huli term not known] - Litoria angiana - frog
[Huli term not known] - Cophixalus cryptotympanum - frog
[Huli term not known] - Phrynomantis wilhelmi(?) - frog

Worms (Annelida, Platyhelminthes):

ngoe - generic term for worms

guriya - pre-contact worm sp.
hagoli - pre-contact: worm sp.
kau ngoe - Pontoscolex corethrurus - introduced worm sp.
pedere / pedera - Amynthas corticus - pre-contact (but not indigenous) worm sp.
("wriggler")

[Huli term not known] - large white pre-contact worm sp. fed to pigs

Sources:

G.Allen 1991, pers.comm.1993; Ballard fieldnotes; Dwyer 1992; Flannery 1990;
Conference 1971; Smith 1980.
APPENDIX B9

BIRDS OF THE TARI REGION

The generic Huli term for all birds is *ega* (including *ega yari* for cassowaries). Species without Huli terms include some of those species that have been identified by ornithologists as living in the Tari area (M.Laska pers.comm., Frith and Frith 1992). This list has been compiled partly on the basis of field identifications, but largely through the use of the illustrations in Beehler et al. (1986); though all birds listed here have been identified in the Tari region (Frith and Frith 1992), this list should thus be regarded as only a preliminary attempt at matching Huli terms with scientific species.

Conventions:

*yari* - Huli term  
(hono gaga) - kai mini praise term  
*Casuaris bennetti* - scientific term  
Dwarf cassowary - common term

Source abbreviations:

@ - Goldman (1981a)  
d - Huli Language Conference (1971)

A. Generic Huli terms for birds:

*bai*: generic term for parrots  
*gope alua*: generic term for honeyeaters, sittellas and treecreepers  
*habo*: generic term for ducks  
*ndi ndu / ndi ndulu*: generic term for swiftlets  
*ngoe pengeda*: generic term for honeyeaters?  
*urubu*: generic term for parrots  
*yagua / nene*: generic terms for hawks, goshawks and buzzards

B. Bird species of the Tari region, listed by Huli term:

*abua hege / abua haga* (d) / *abuage* (@): *Cacatua galerita*; Sulphur-crested cockatoo  
*abua yale / wabula* (@) / *buale* (@): *Rhyticerous plicatus*; Blyth’s hornbill  
*alu mala*: *Ninox theromacha*; Papuan boobook  
*alu*: *Melidectes befordi*; Belford’s melidectes  
*anduya*: *Rallus pectoralis*; Lewin’s rail  
*aro gogebe*: *Tanysiptera nympha*; Red-breasted paradise-kingfisher  
*aro gogebe / aragoabe* (@): *Paradisaea rudolphi*; Blue bird of paradise  
*bai mope*: unidentified parrot sp.  
*bai nana / bai hinana / bai hinini / hinayaga* (d): *Alisterus chloropterus*; Papuan king-parrot  
*biyakuya*: *Phylloscopus trivirgatus*; Island leaf-warbler  
*booyate*: *Lanius schach*; Long-tailed shrike  
*buruni*: unidentified bird sp.  
*demogo*: *Mino dumentii*; Yellow-faced myna  
*demogo*: *Melipotes* sp.; Common smokey honeyeater  
*demogo*: *Melidectes torquatus*; Omate melidectes  
*denge denge*: *Arenaria interpres*; Ruddy turnstone  
*dongedgware*: *Coturnix australis*; Brown quail  
*egehab*: *Anhinga melanogaster*; Darter  
*ewa tia*: *Tyto tenebricosa*; Sooty owl  
*ewa tia*: *Tyto capensis*; Grass owl
gambegoba: Clytomyias insignis; Orange-crowned fairy-wren
gangade (@) (timangagade): Pteridophora alberti; King of Saxony bird of paradise
gapiago / gobi hagua (d): Egretta ibis; Cattle egret
gihende: Erythura papuana; Papuan parrot-finch
guinda: unidentified parrot sp.
gomia / komia (@) (gulu gomia / gulu wambia): Paradisaea minor; Lesser bird of paradise
gula / gula gula: Epimachus meyeri; Brown sicklebill
gula / gula gula: Epimachus fastuosus; Black sicklebill
habo: Anas waigiuensis; Salvadori's teal
hai nqe: Melidectes princeps; Long-bearded melidectes
hajo: Rallus philippensis; Buff-banded rail
halangai / dagia / halengu: Ninox connivens; Barking owl
hariawe / hari tawe (@) / hariyawa (d): Harpyopsis novaeguineae; New Guinea harpy-eagle
hengedo (@): Trichoglossus goldiei; Goldie's lorikeet
hombedaguia (@) / homabaragaua (d): Amblyornis macgregoriae; Macgregor's bowerbird
kabale: Astrapia stephaniae; Stephanie's astrapia
kandi (@) (kandi ayul/guru kandi): Parotia sp.; generic term for Parotia spp.
kele kele (@): Trichoglossus haematodus; Rainbow lorikeet
kibi: Gallinula tenebrosa; Dusky moorhen
kudaqa: Philemon buceroides; Helmeted friarbird
kugu: unidentified shrike-thrush sp.? 
kui ega: Lonchura spectabilis; Hooded mannikin
kulya ale: Porphyro porphyrio; Purple swamphen
kurega: Charmosyna josefinae; Josephine's lorikeet
kurega: Charmosyna pulchella; Little red lorikeet
lilau: Gerygone palpebrosa; Fairy gerygone
malibu: unidentified bird sp.
nid ndau / n'di ndulu: Collocalia sp.
nedau / nedai (d): Halisaur indus; Brahminy kite
ngoi pengeda: Iffria kowaldi; Blue-capped ifrita
ngoe pengeda: Halcyon macleayii; Forest kingfisher
obedobe: Peneothello sigillatus; White-winged robin
padarembo: Oreocharis arfaki; Tit berrypecker
parige: Falco peregrinus; Peregrine falcon
piagoli: Rhipidura albomarginata; Friendly fantail
piagoli: Rhipidura leucophrys; Wille wagtail
piagoli: Petroica bistortata; Mountain robin
ponge: Lophornis superba (female only; male: yagama); Superb bird of paradise
ponge: Rallina forbesi; Forbes' forest-rail
tapaya yuwi: unidentified bird sp.
tegele: Malurus alboscapulatus; White-shouldered fairy-wren.
tendebo / tendabine (d): Rhipidura brachyrhyncha; Dimorphic fantail
tengetenge: Sericornis nouhuysi; Large scrub-wren
timbiluli: Peltops montanus; Mountain peltops
tolagili?: Sericornis perspicillatus; Buff-faced scrub-wren
tuba: unidentified bird sp.
ubiya: Paradisaea raggiana; Raggiana bird of paradise
umi: Podargus sp.; Frogmouths
undia (@): Neosittacus muschenbroekii; Yellow-billed lorikeet
uru kama: Probosciger aterrimus; Palm cockatoo
urubu gela: unidentified parrot sp.
urubu hegele: unidentified parrot sp.
urubu ngawe: Charmosyna papou; Papuan lorikeet
yagama: Lophornis superba (male only; female: pongo); Superb bird of paradise
yagombe / yatagobe (d) / yagobe (d): Mearnsia novaeguineae; Papuan spine-tailed swift
yagua: Hemicopermis longicauda; Long-tailed buzzard
yagua?: *Eudynamys taitensis*: Long-tailed koel
yamama / yamoma / timuhumbi?: *Coracina caeruleogrisea*: Stout-billed cuckoo-shrike
yamama / yamoma: *Coracina melaena*: Black cuckoo-shrike
yame / yami / yari mindi {bebe yame / bebe alu}: *Casuaris casuaris*: Southern cassowary
yange {elabe yange (@)}: *Astrapia mayeri*: Ribbon-tailed astrapia
yari {hono gaga / habo yari / habo lima / ugura (@)}: *Casuaris bennetti*: Dwarf cassowary
APPENDIX B10

MBINGI GENEALOGICAL PROOFS

MBINGI PROOF 1 (Dagima clan; source: Dabale Timuria)

- Mbi b. ?1810 ?1770 ?1740 Born during mbingi
- Tumbira b. ?1840 ?1805 ?1780
- Wagoya b. ?1900 ?1875 ?1860

MBINGI PROOF 2 (Tari Dindiago; sources: Pudaya, Mabira Hege, Tumbo)

- Ngoari-Gaea b. ?1842 ?1822 ?1782 Born on first day after mbingi
- Ngoari-Pabe b. ?1902 ?1892 ?1882
- Ngoari-Tamiteli b. 1962

MBINGI PROOF 3 (Hubi clan; source: Dimbabu)

- Maiya-Dalibe b. ?1840 ?1815 ?1810 Said to have lost crops due to mbingi
- Maiya-Tawa b. ?1900 ?1895 ?1890
- Maiya-Yanabe b. ?1930
**MBINGI PROOF 4** (Pi clan; source: Pudaya)

- Pari | b. 1814 | 1794 | 1774 | Alive during *mbingi*
- Gelaya | b. 1844 | 1829 | 1814 | Born after *mbingi*
- Ayu | b. 1874 | 1864 | 1854 |
- Aio | b. 1904 | 1899 | 1894 |
- Pudaya | b. 1934 |

**MBINGI PROOF 5** (Tani Hebaria; sources: Pudaya, Tumbu)

- Mbiyago | b 1868 | 1853 | 1838 | Born during *mbingi*
- Andail | b 1898 | 1888 | 1878 |
- Bareggu | b 1928 | 1923 | 1918 |
- Mogai | b 1958 |

**MBINGI PROOF 6** (Bai Yabe; source: Hubi-Morali)

- Hubi-Yabe | b 1796 | 1776 | 1756 | Provoked *mbingi*
- Hubi-Pindu | b 1826 | 1811 | 1796 | Named after *da pindu*
- Hubi-Kuliya | b 1856 | 1846 | 1836 |
- Hubi-Mabi | b 1886 | 1881 | 1876 |
- Hubi-Morali | b 1916 |
APPENDIX B11

CROP GAMU SPELLS

HAI GAMU (gamu for bananas), Gomengi, 28.8.91, 91/19A:145-151

This gamu would be said when the hole to plant a banana had been dug:

Hela Obena mbaliya
Let us go to Enga
Dugu Yawini mbaliya
Let us go to Duguba
Mirila mbaliya
Let us go to Duna
Ngui dara dabe
So bear 15 rows [of bananas]
Pi dara dabe
Or bear 10 rows
Hombe dara dabe
Or bear 12 rows
Danda habe
And bear them facing inside [towards the house where they can be seen, and away from others who might be tempted to steal them]

MA GAMU (gamu for taro), Gomengi, 28.8.91, 91/19A:151-155

This gamu would be said when the hole had been dug to plant a taro sett:

Hulta tole wibe
Alua tole wibe
Ayana tole wibe
Angalia tole wibe
Is this a boulder from the banks of the Hulia, Alua, Ayana and Angalia rivers that I am planting?

[An exhortation to the taro to grow to the size of the large boulders found in the named rivers]

HINA GAMU (gamu for sweet potato), Gomengi, 28.8.91, 91/19A:164-169

'When we wanted to plant the heme, hangabo, mandiyame and kuli varieties of sweet potato, to ensure that they grew firm tubers, we would say:

Giri gere labe
When you bear, may they hang, hang
Bingi bungu labe.
When you bear, may they fill, fill [the mound].'
APPENDIX C1

AERIAL PHOTOGRAPHIC COVERAGE OF THE TARI REGION

This Appendix lists and briefly describes all of the aerial photographic coverage of the Tari region available for this study. The coverage is described in terms of the different photographic "series" arising from daily aerial "sorties", the sequences and directions of the "runs" which comprise each sortie and the individual "frames" shot along each run.

Although the earliest flights over the Tari region included brief sorties over Margarima in October 1934 and over the southern ends of the Tari and Haeapugua basins in February 1936 (Appendix B1), neither these nor any later pre-war flights appear to have taken aerial photographs of the region. Tari was not a field of military operations during the Second World War, when much of the rest of the country was mapped from the first intensive aerial photographic coverage. The first known aerial photographs of the Tari region are a short oblique black and white sequence from a Trimetrogon sortie flown on 1 November 1948, running directly over the high altitude Andabare basin to the east of Tari along a roughly north to south route1. Although the quality of prints from this run is high, they provide only a tantalizing glimpse at a low angle of the eastern Tari basin, with the Haeapugua, Dalipugua and Mogoropugua basins visible just beneath the horizon. Further prints from either this or associated sorties may be extant, but have not been traced.

The first nationwide coverage, initiated in 1954 and commonly referred to as the "CAJ" series, provided an excellent aerial photographic baseline at an altitude of 25 000' for the entire Tari region in 1959. A second national coverage was undertaken by the RAAF between 1972 and 1975 in its "Operation Skai Piksa" (also identified by the "CAJ" prefix but distinguished here as the "Skai Piksa" series). This yielded a much less satisfactory quality of print, shot at an altitude of 36 000' and often with a high incidence of cloud coverage. One set of two 1972 sorties over the Tari region was presumably undertaken as an early part of the "Skai Piksa" exercise, but shot along similar lines to the earlier "CAJ" series at altitudes of slightly over 25 000'; unfortunately neither sortie covers the Haeapugua area.

The most recent extensive coverage of the Tari region was commissioned by the World Bank-funded Southern Highlands Rural Development Project in 1978 and provided the basis for the maps of parish boundaries and land use produced by Allen and Wood (Allen, Wood and Vail 1990, Wood and Allen 1982). The coverage of this series was restricted to the Tari, Haeapugua and Dalipugua basin areas, but the high quality of the frames, shot at an altitude of only 9950', renders this the best material for my purposes. Since 1978 there has been only sporadic aerial coverage of the Tari region for specific projects, the Department of Works 1990 "Tagari River" series being one example.

Other than these fixed photographic sorties, there have also been a number of manual or hand-held oblique sorties undertaken independently by researchers working in or visiting the Tari region. The authors and dates of those manual sorties that I have been able to locate that cover Haeapugua include R.J.Lampert and J.Golson, in 1972, B.J.Allen in 1981, and myself in October 1992.

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1. Trimetrogon photography, commonly employed during and immediately after the war, consisted of three cameras, one mounted vertically and two obliquely to either side.
1948 TRIMETROGON SORTIE
[b/w, oblique]

RT - 5RGL - M - 1087 - 338RS - 1 NOV 48 - L 6 [63 - 68]

From north to south over the Andabare Basin, view over eastern Tari basin, Haeapugua, Dalipugua and Mogoropugua just visible beneath the horizon.

1959 ADASTRAPHOTO "CAJ" SERIES
[b/w, vertical]

Good resolution but small-scale print size.

DAGIA RIVER - RUN 1 - 24.5.59 - 25 000' - [CAJ 120/5110-5119]

From west to east, over N.Wabupugua, N.Haeapugua to the Paijaka Plateau.

DAGIA RIVER - RUN 2 - 24.5.59 - 25 000' - [CAJ 116/5110-5119; 5120-5135]

From east to west over the central Tari basin, Haeapugua and Wabupugua.

DAGIA RIVER - RUN 3 - 17.6.59 - 25 000' - [CAJ 120/5095-5109]

From east to west, picking up from Doma Peaks Run 3 in the central Tari basin: across S.Haeapugua basin and the Lower Tagali and Hanimu valleys.

DAGIA RIVER - RUN 4 - 17.6.59 - 25 000' - [CAJ 120/5001-5007]

From west to east, starting over Nogoli in the Lower Tagali valley crossing the Dagia River and the S.Tari basin to Mt.Ambua.

DAGIA RIVER - RUN 5 - 17.6.59 - 25 000' - [CAJ 119/5051-5055]

From east to west, crossing over the Lower Dagia river and the Dagia-Tagali junction.

DOMA PEAKS - RUN 3 - 17.6.59 - 25 000' - [CAJ 120/5080-5094]

From east to west following the Alua river across the Tari basin from its headwaters as far as Urupupugua; CAJ 120-5094 links to Dagia River Run 3 CAJ 120-5095.

Also:

CAJ SORTIE 122 - 18.6.59 - 25 000'

Covers Paijaka Plateau, Mogoropugua and Dalipugua basins.

1972 R.J.LAMPERT AND J.GOLSON
[b/w and col, manual low oblique]

An undated and unnumbered set of 11 colour slides and 21 black and white prints shot from a fixed-wing aircraft, covering Wabupugua and Haeapugua.
1972 COMMONWEALTH OF AUSTRALIA "CAJ" SERIES (EARLY "SKAI PIKSA")
[b/w, vertical]

DAGIA RIVER - RUN A1 - 28.7.72 - 25 400' - [CAJ 1483/1719-1744]

From west to east, over southern parts of E Mama, Lebani, Mogoropugua and Dalipugua basins to the Upper Tagali river and Pajjaka plateau.

DAGIA RIVER - RUN 5 - 7.9.72 - 25 800' - [CAJ 1479/5249-5258]

From east to west, starting over Dauli (S.Tari Basin) and proceeding across the Dagia, over Nogoli and the Gigira (Hides) range.

1973 "SKAI PIKSA" SORTIE
[b/w, vertical]

WABAG SORTIE 17, RUN 24 [169-187], 24.4.73, 36 000'

Full coverage of the Tari, Haeapugua and Wabupugua basins and the Lower Tagali and Hanimu valleys. Fair resolution but original prints at too small a scale for detailed ground work.

1975 "SKAI PIKSA" SORTIE
[b/w, vertical]

WABAG SORTIE 241, RUN 23A [26-46], 8.7.75, 36 000'

Full coverage of the Wabupugua, Mogoropugua, Dalipugua, Haeapugua and Tari basins and the Pajjaka plateau. Fair resolution but original prints at too small a scale for detailed ground work.

1978 MAPMAKERS SERIES
[col, vertical]

RUNS 1-27, 4.9.78 - 15.11.78, 9950'

Full, low-level coverage in a series of parallel runs along a NW - SE axis, of the Tari, Haeapugua and Dalipugua basins. Excellent resolution.

1981 B.J.ALEN
[col, manual low oblique]

4 colour slides of Haeapugua shot at a low oblique angle in February 1981 from a helicopter.

1990 DEPARTMENT OF WORKS "TAGARI RIVER" SORTIE
[b/w, vertical]

RUN 1, 1:6,000, 20.11.90, [1-5]

From SE to NW over the Tagali River bridge along the route of the Highlands Highway for the Department of Works. Poor resolution and very limited coverage, but comparable in scale to, and thus complementing, the 1978 Mapmakers series.
1992  C.BALLARD
[b/w, manual low oblique]

23 handheld low and high oblique black and white prints of Haeapugua shot from a helicopter in October 1992.
APPENDIX C2

A SUMMARY OF CLAN ORIGIN (DINDI MALU) NARRATIVES FOR SOME OF THE HAEAPUGUA CLANS

Multiple versions of narratives of clan origins (dindi malu) were recorded for most of the clans of the Haeapugua basin. Brief summaries of some of these narratives from those clans in the vicinity of the Haeapugua wetlands are given here, together with basic genealogical structures.

1. YAMI AND YARI PHRATRIES

Narratives relating to the cassowary brothers, Yari and Yami, are acknowledged as dindi malu for most of the clans now resident in the Haeapugua area. The significance of this narrative complex extends far more widely than this, however, and versions of the Yari and Yami narrative have been documented amongst Duna (where the narratives are situated in Haeapugua) and as dindi malu amongst some of the Huli clans at Margaririma who trace their ultimate origins to Haeapugua. The abbreviated version given here comments upon and summarizes elements from some fifteen different versions of the narrative given at Haeapugua:

The dama Huriba Hui and Huriba Ui find a cassowary egg in the bush at Bebealia Punu in Duguba (the dindi pongone gebeanda ritual site in Bedamini territory to the south of Huli) and carry it back to Halianda, the residence of Hali-Tulubi (ancestor of Haliali clan at Puren on the western side of the Haeapugua basin). The egg hatches, revealing two boys, Yari (vari - Casuaris bennetti; Dwarf cassowary) and Yami (yami - Casuaris casuarus: Southern cassowary). Hali-Tulubi crafts a bow, Danda Gegeano, and gives it to the brothers. They fight over it, and the bow leaps from their hands and flies off into the air making a noise, "gununu, gununu". They follow it until it lands at the dindi pongone gebeanda at Gelote. There, as they prepare to seize it, it flies off again, landing this time at the gebeanda at Ira. Each time it lands, they attempt to grasp it, but each time the bow eludes them and flies off to another ritual site. The bow crosses the current path of the Tagali river (the river was not there at this time) and lands at Birimanda, then at Iba Habodaya on Dobani land in the centre of Haeapugua swamp, Waloanda, Tere Kamianda, Egaanda, Taibaanda, Yabira, Dibinipu (in the Tari basin), Garaleanda, Daburaanda, Bebenite and ultimately back to Lambarepugua in the Haeapugua basin, where it sticks fast in the upper branches of a tree. A woman, Dangi Beleme, reaches up and hands them the bow before giving them new names: Yari is to be Dandali, Yami's name is now Dambali. Dandali stays at Taibaanda, but Dambali crosses Haeapugua to the Puren on side and the Tagali flows into its current course behind him, separating the two brothers.

The descendants of Yari/Dandali include the clans of Tani, Dagima, Dabo, Mbuda, Telabo and Hiwa; those of Yami/Dambali are the clans Poru and Yumu (Appendix B6: Gen.1).

1. In some versions when the bow landed at Daburaanda it was seized by the dama spirit, Dabura Yale (the ancestor of Yamama). The bow was then kept in a hut within the ritual site at Daburaanda where it was a focus for ritual until some point after contact when it was lost in a fire. Ngari-Manriga, a dindi gamuyi ritual leader for Tani clan, recalls visiting the hut at Daburaanda and being shown the "bow" which he described as a flat strip of wood about 30 cm long, rotted through. A Gobiya clan ritual leader also saw the Danda Gegeano bow, and described it as a short stick with a hole in the centre through which a rope had been threaded; this "bow", he said, was then swung around on the end of the rope, producing the sound "gununu, gununu". Evidently, Danda Gegeano was actually a bull-roarer, an artefact employed in cults in the Papuan Gulf and occasionally on the Papuan Plateau (T.Emst pers.comm.).
2. DOBANI

Dobani were resident at Haepapuga initially as *yamuwini* to Goya subclan of Poro clan, when Poro were still *tene* there. After Poro Goya and Poro Gu retreated from Haepapuga to land belonging to the Poro Ango and Poro Pebe subclans in the vicinity of Lake Alibu, Dobani continued to reside at Haepapuga, initially holding the land as *yamuwini* in anticipation of Poro Goya's return, but subsequently assuming *tene* status to the land in their own right. Dobani origins lie ultimately in Duguba, though the route to Haepapuga has been circuitous, and there are Dobani clan members resident as *tene* in two other parishes, to the south in the Komo basin and at Yangome in the southern Tari basin, and as *yamuwini* in the eastern Tari basin, in the Lower Tagali valley, at Mogoropugua and at Yaluba (where Goldman (1983) identifies them as “Tobani”). The much abbreviated account below summarizes Dobani *dindi malu*, drawing on narratives documented at Komo, Yangome and Haepapuga.

Dobani are ultimately descended from Gebeali, whose descendants lived in Duguba, to the south of Komo. Ira was the first to come to Komo, living at Wongoba, Tumbabalu, Dange Iba and Maloba. He and his son, Narali, both married women from Duguba Muguli. Narali then crossed the lower Tagali river and bore Walubu-Pone or Poli at Yangome, in the southern Tari basin. While at Yangome, Pone encountered the *dama* Gayabi Tililigo at Gayabi *gebeanda*, now the central *gebeanda* for Dobani. Gayabi Tililigo performed the *uru kamia* ritual for Dobani, and they prospered and proceeded to marry and settle widely.

The Dobani lineages now resident at Haepapuga came from Yangome some eight generations before the present adult generation, after they were routed in a major war with clans from the Hoyaba area. As they had been fighting in the cause of their *aba* from Poro clan, they sought refuge with Poro. Poro hid them from their pursuing Hoyaba enemies on the Abagopugua portion of Poro's Haepapuga land, on the far side of Lagale Mandi ridge; Dobani have been resident there since, with many individuals maintaining dual residence between Yangome and Haepapuga prior to contact.  

Haea-Yoge provides a Poro perspective on the process of land assumption that followed the flight of Poro, incidentally illustrating the category roles of *yamuwini* and *dombentali*:

*Iraga heeda ogo ni dindu walu ibini.*
It was at this time that we left our land.
*Dobani amu bereago, i ini biraabo henego, Dobani mo minigo beda laro.*
Where Dobani sit over there, I sat before, and I told them to stay there.
*O dai buwa unu heagoni wandari urume wini, bi bai uru, Tani baile uru, dai bu dindi wu hai hene, ka, purogo lene ndo.*
Those who were born of [Tani] women [i.e. Tani *yamuwini*], those who were in between (*bi bai*) [i.e. *dombentali* related to both Tani and Poro], those who resided (*balle*) with Tani, they returned and stayed there.

Haea-Yoge, 25.6.91, 91/7A: 427-451

A skeletal genealogy for Dobani clan that seeks to demonstrate the nature of the relationship between the widely scattered sub-clans and lineages is provided in Appendix B6: Gen.4.
3. BOGORALI

Bogorali, who were evicted from Haeapugua by Tani in the 1890s, trace their origins in myth to the Ipili/Paiela-speaking groups of Mt Kare and the Porgera area; the name Bogorali literally means "men-of-Porgera" (Bogora (Porgera)-ali).

The Bogorali ancestor, Layuni, was chased by his brothers from Porgera in disgust at his habit of biting the heads off possums. They pursued him to Hawa and Daburaanda in the Tari basin and then to Poro land at Haeapugua. When Layuni crossed the Tagali river to the dindi pongone gebeanda of Irari on the Pureni side, Poro blocked the brothers' passage and they turned back to Porgera. Layuni married a woman from Dabu clan, the owners of the Irari site, and returned across the Tagali to settle on Poro land.

4. MUNIMA

Munima claim ultimate origins at Lake Kutubu to the southeast of Huli territory. Their land in the Haeapugua basin was held initially as yamuwini to Bogorali, though they have assumed unee status there since the flight of Bogorali in the 1890s. The following summary of Munima dindi malu traces their movement from Kutubu to Haeapugua.

The dama, Gurubu, lived at Iba Gurubu [Lake Kutubu], where he bore Pogono. Pogono and his wife Duta left their home at Malibu in the Kutubu area and walked to Hari Mbagua, then to Yula in the Irawi area, to Ayagele and then to Homare in the centre of Haeapugua where the Tagali now flows. There Duta bore their son, Yula, who continued to travel to Irari, then to Lamta Irabu and Ega in what is now Munima parish and on over Lagale Mandi ridge to the Munima valley. Yula's son Lande married a Bogorali woman, and it is presumably through this connection that Munima came to be resident in Haeapugua as Bogorali yamuwini.

5. TAMBARUMA / LUGUNI / TIGUA

Tambaruma, Luguni and Tigua are all member clans of a single phratry which claims Duguba origins. All three formerly resided in massive parallel parishes running from the Tereba river in the Haeapugua basin south as far as the Tagali river in the lower Tagali valley. The link between the three clans is slightly obscure but also unusual in that it consists of an illicit congress between one or more ancestral dama and two sisters. The following composite account briefly describes the major features of dindi malu for the three clans.

The original Tambaruma ancestor, Hamani, was a dama spirit living at Hari Abaga [Mount Bosavi?] in Duguba. His son, known as Buluanda Diwa or Diwa Hamani, travelled from Abaga to Iba Maliana, Behibirila, Tabayale Kuyama, Dalihuni, Daguali and ultimately to Yalegambe, the gebeanda for Tambaruma clan, which lies in the southern portion of Dumbiali parish. He travelled on to Dumbiali clan in Obena to acquire a wife. She bore a son, Daburaya or Lemola. Daburaya then slept with two sisters, Yoleme and Dereme, both from Dabu clan in the Pureni area of Haeapugua, but paid no brideprice. Luguni narratives identify a different heritage in the male line from an Obena dama, Beanda Bai, whose son Beandali travelled through Hambuali to Duguba. Beandali's son Haganuali then returned from Duguba to Haeapugua, where he also slept with the sisters Yoleme and Dereme. From these unlawful unions
came the immediate ancestors of Tambaruma, Tigua and Luguni, who settled around Haepugua.

Interestingly, the critical connection established through marriage or illicit sex between the immigrant ancestors of Bogorali, Tambaruma, Tigua and Luguni, and women from Dabu clan possibly indicates that Dabu clan, former owners of the Irari dindi pongone gebeanda on the Puren side of the Haepugua basin, may once have been principal landowners on both sides of the Tagali river.
APPENDIX C3

DATING THE TANI-TAMBARUMA WAR

A number of individuals are commonly named in narratives from a wide range of clans as having played a part in the war between Tani and Tambaruma that led to the eviction of Tambaruma from their Haecapugua lands:

1. Hebaria, the Tani Hewago agali haguene (Appendix B6: Gen.3), was killed an unspecified period of time before the war, providing Tani with the initial motive for revenge against Tambaruma. A GEB of ?1765 AD for Hebaria places him as approximately 55 when his last child was born in ?1820 AD. This provides a terminus post quem for Hebaria’s death, which is also unlikely to have been much later, given his GEB, than about ?1840 AD.

2. Abiya (Tani Doromo; GEB: ?1799 AD) is said to have instructed his ally Ari-Magola (Dcmbe tene, Hiwa He yamuwini; GEB: ?1788 AD) to collect rope vine from an area adjacent to Tambaruma territory. Magola was killed by Tambaruma and this led immediately to the Tani-Tambaruma war. As Magola fathered just three children from his only wife before he died, a normative male age of 35 at the birth of the first child and birth-spacing of 5 years thereafter would imply a GE date soon after ?1833 AD for his death.

3. At an undetermined point after the war had ended, Agiabu (Tani Doromo; GEB: ?1818 AD) is said to have called upon his aba kin amongst Tambaruma to return to live at the newly named parish of Dumbiali. Agiabu’s sister’s husband, Dabura-Hargube (Tambaruma; GEB: ?1770 AD), is said still to have been alive during the war. Hargube’s sons, Gurubu (GEB: ?1805 AD) and Pago (GEB: ?1812 AD) are the individuals who led their Tambaruma lineages back to settle at Dumbiali (Appendix B6: Gen.2). Presuming that Agiabu, Gurubu and Pago are identified in the narrative because they were adult leaders at the time of this rapprochement, it is unlikely to have occurred much before ?1838.

Given these different strands of evidence, the following grounds are proposed for a date for the Tani-Tambaruma war: the GEB of Ari-Magola’s last child at ?1833 AD is the most precise genealogical reference to the onset of the war. This accords well with a date for Hebaria’s death after ?1820 AD and with the GEBs for the prominent individuals identified in narratives of the war and its aftermath. On this basis, a GE date of around ?1835 AD is proposed for the Tani-Tambaruma war.

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1. The conventions employed in generating Estimated Birth (EB) and Genealogically Estimated Birth (GEB) dates are described in Appendix B6.
APPENDIX C4

DATING THE TANI-BOGORALI WAR

Due to the relative recency of this event, large numbers of individual ancestors are identified as having participated in the war between Tani and Bogorali that led to the eviction of Bogorali from their Haeapugua parish territory. The identities of many of these individuals are confirmed in narratives from a wide range of different clans. Some of the key grounds for nominating a date for the war are as follows:

1. The most secure Bogorali genealogy that I recorded was that of Ninumali sub-clan. Within this sub-clan, Ngoari-Mala (GEB: ?1813 AD) and his first son (and first child) Ngoari-Hege (GEB ?1848 AD) are both said to have been alive during the war, only shortly before the marriage of Hege to his second wife and the birth of her first son, Ngoari-Homogo (GEB: ?1893 AD).

2. One of the wives of Ngoari-Gobe (GEB: ?1860 AD), a Bogorali leader during the war, is said to have given birth to their son Ngoari-Kulu (GEB: ?1895 AD) during the flight of Bogorali from Haeapugua.

3. The second phase of the Tani-Bogorali war opened with the death during an attempted rescue of an old Tani man, Ngoari-Luni. Luni was born within the GE range of ?1805 - ?1820 - ?1835 (where the middle estimate is that employing an average generational length between first sons of 35 years). Assuming a maximum possible age of 75 years for adult men, the war could not thus have occurred much later than the range ?1880 - ?1895 - ?1910.

4. The major fight leaders on the Tani side included Ngoari-Pomia (Tani Yanga; GEB: ?1865 AD), Maiya-Toneya (Hubi tene, Tani Lebe yamuwini; GEB: ?1860 AD), Ngoari-Buah (Tani Boroba; GEB: ?1863 AD) and Ngoari-Agihe (Tani Fangane; GEB: ?1845 AD). Assuming that these men were all adults of at least 25 years by the time of the war, this suggests that the war could not have taken place much earlier than the range ?1870 AD - ?1890 AD.

On the basis of the above evidence, a date for the Tani-Bogorali war during the early 1890s is proposed. This allows for the births of Ngoari-Kulu (?1895) and Ngoari-Homogo (?1893) while straddling the period of overlap between the possible lifespan of Ngoari-Luni, given his GEB of ?1820, and the attainment of adulthood by the Tani fight leaders listed.

1. The conventions employed in generating Estimated Birth (EB) and Genealogically Estimated Birth (GEB) dates are described in Appendix B6.
APPENDIX C5

CENSUS FIGURES FROM HAEAPUGUA

The most reliable guides to the size and distribution of the population of the Tari region are the figures maintained on a regular basis by the Tari Research Unit of the Papua New Guinea Institute of Medical Research, which has monitored population size, health and mortality for the Tari basin, parts of the Patjaka plateau and the eastern half of the Haepugua basin since 1970. Patrol officers conducting early censuses in the 1950s and 1960s were clearly aware of the limits to their comprehension of the complexities of Huli social structure and residential practices and were in no doubt that their figures were generally underestimated, often attempting to estimate that proportion of the population which they thought they had not seen. Census figures fluctuated initially, generally increasing dramatically and then stabilizing as the local population became familiar with census proceedings. The 1980 National Census is widely held to have been the most accurate nationwide survey since Independence in 1975, with comparison of the 1980 and 1990 census results below supporting the contention that the latter census was, in places such as the Haibuga-Munima Census Division which takes in the Haepugua basin, wildly inaccurate. Possibly more accurate for the Tari region are the Provincial Census surveys of 1979 and 1983 (Crittenden and Puruno 1984).

Haibuga-Munima Census Division

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Map study area parish populations:

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Sources:

1958: Jensen-Muir 1958
1962: Foreman 1962
1985: John Vail pers.comm. (for figures from the Tari Research Unit Clan-Residence Survey, 1985)
1991: Ballard field notes

Notes:

- Populations for both Tani parishes (Taibaanda and Walete) included together.
APPENDIX C6

WETLAND GARDEN CASE HISTORIES

The following case histories provide details of the oral history of wetland drainage and garden use within four areas of the southern part of Haapugua swamp, identifying individual drain-diggers and locating them genealogically. The named areas of the swamp are to be found in Figures C3 and C4. The conventions employed in generating Estimated Birth (EB) and Genealogically Estimated Birth (GEB) dates are described in Appendix B6. The chronological conclusions at the end of each of the case histories are summarized in Figure C24.

CASE HISTORY 1. Iba Hagia / Iba Haawe area (Dobani).

Dobani, who were resident in Haapugua initially as Poro yamuwinini, have lived on the dryland margins of Haapugua at their current location for at least 10 or 11 generations; ironically (given their initial yamuwinini status), together with those few Tani lineages who have maintained continuous residence at Taibaanda, Dobani thus boast the longest tradition of continuous residence along the margins of Haapugua swamp. The first Dobani resident to garden in the swamp was Walubu-Habolo (Dobani tene; GEB not determined), who cut drains around the first row of gardens along the original margins of the swamp. The Haawei iba puni channel, which drains from the resurgence of the Haawei river at the base of Lagale Mandi ridge, is said to have been dug to the Tagali river in a single event by Walubu-Bayale (Dobani tene; GEB not determined), who began the drain at the Tagali and worked upstream to capture the Haawei flow. The Hagia river was extended in stages into the swamp from the margins, initially by Ngoari-Awe (GEB: ?1860 AD), Ngoari-Holi (GEB: ?1860 AD) and Ngoari-Hiraya, all Tani Tabuya tene and Dobani yamuwinini, and Walubu-Layawe (Dobani tene; GEB: ?1850 AD). The generation of their sons, who included Ngoari-Waigo (GEB: ?1900 AD) and Ngoari-Andagwa, are said to have completed the task of linking the Hagia iba puni to the Haawei channel. Part of the central stretch of the Hagia iba puni was apparently dug by Walubu-Alima (GEB: ?1875 AD). Though the Haawei channel was apparently initiated before the Hagia channel, this event cannot yet be dated. The initiation of the Hagia iba puni probably took place no earlier than about ?1880 AD; Alima's extension of the Hagia occurred no earlier than about ?1895 AD; and the final link between the Hagia and Haawei channels was effected no earlier than about ?1920 AD.

The first Dobani residents then to exploit the iba puni and dig gardens in the swamp centre (and not simply as marginal extensions from dry land) were Walubu-Bolangaya (GEB: ?1893 AD), Walubu-Pogoli and Walubu-Ngibe (GEB: ?1908 AD). This phase of use could thus have begun as early as about ?1913. Certainly there was active extension of the drain network and use of the drained blocks for gardens during the early 1920s, when Dobani and Hagu fought a bitter war over contested swamp land along the southern side of the Haawei iba puni (see Case History 2 below). The bulk of the wetland Dobani gardens appear to have been abandoned in about 1932, for unspecified reasons. Thereafter, there has been only sporadic drainage and use of individual or adjacent wetland blocks and the wetland centre has reverted to full swamp with a surface cover of water.

Two such wetland cultivation events are visible in the 1959 and 1978 AP coverages; both required the initial reclearance of the Hagia or Haawei iba puni channels, followed by drainage of the block perimeters. The 1959 shows two adjacent blocks in use alongside the Haawei channel; this brief phase of use was undertaken jointly by Walubu-Mabira and Walubu-Wangiyu (both Dobani tene), Dali-Gangoea (Gobiya tene, Dobani yamuwinini), Hubi-italia (Tigua tene, Dobani yamuwinini), Egabaga and Ngoari-Dimbabu (Egago tene) (all Dobani residents at the time), who divided the drained blocks into plots for use by their individual families. The 1978 AP coverage
shows a single large block in use midway between the Hagia and Haeawi channels, on the Tagali side of the Iba Habodaya lake (Figure C12); this was another case of brief drainage and use of an isolated area, in this instance by Ngoari-Handawi (Tani Lebe tene, Dobani yamuwini; EB: 1932 AD). Throughout this period, the first two to three rows of blocks along the dryland/wetland margin were being brought continuously into and out of use.

The most recent phase of wetland activity has been the reclearance of the Haeawi and Hagia iba puni channels in 1991. This event, which involved a total of 32 men working in daily groups of 10 to 12 each Tuesday, Thursday and Saturday for eight weeks, was organized by three young men from Dobani parish, Walubu-Aluya (Dobani Buruli tene; B: 1963), Hulu-Undialu (Honaga tene, Dobani and Tani Tabayia yamuwini; B: 1964) and Dayarda Hayabe (Tani Egago and Dobani Buruli yamuwini; B: 1958); the volunteer work crew was "recruited" largely amongst aba relations and through ties of friendship from amongst residents of Dobani and both the Tani (Taibaanda and Balete) parishes. By organizing this project and committing themselves personally to the bulk of the labour, the leaders have acquired a position from which they can dispose of rights to garden owners wishing to link their garden drains to the Haeawi channel; any garden owner who proceeded to drain a block into the Haeawi or Hagia rivers would be expected to provide some form of compensation to the channel-clearers or run the risk of having the crops pillaged from their new wetland gardens. Interestingly, the initial act of drain reclearance was not immediately followed by block drainage; instead, the project leaders suggest, they will leave the water table of the swamp area within the catchments of the Haeawi and Hagia to lower for a number of years and then proceed, as needs and the circumstances of climate dictate, with block drainage and gardening.

Mention should be made here of the curious set of small, irregular blocks closest to the Tagali river, on the northern side of the Hagia iba puni. These are drained directly to the Tagali river by a small channel, Nano Puni. Nano Puni, and the perimeter drains for the blocks, were initially dug by Dali-Dara (Tani Agiabu and Layila yamuwini) with the assistance of Walubu-Bolangaya (Dobani tene; GEB: ?1893 AD), at an unspecified time during the phase of extensive Dobani wetland use in the late 1910s and 1920s. Their intention was apparently to establish gardens for their extensive pig herds and to build a house in the swamp from which to watch over both the gardens and pigs; so near to the Tagali river, people lived in constant fear of pig-rustling raids from the Puren side of the Tagali. Later, the blocks were re-drained and used by Ngoari-Mawi (Tani Agiabu tene; GEB: ?1911 AD), who also lived there to tend his pigs. Alembo, Mawi's son (EB: 1951), remembers living in the swamp house as a small child, but the Nano Puni blocks were certainly abandoned by 1959, when they appear as such in the AP coverage of that year, and have not been re-used since.

In summary, the use of wetland blocks along the dryland margins of what is now Dobani parish appears to date to at least the mid-1800s. Drainage of the Haeawi and Hagia channels followed two quite distinct strategies, the Hagia channel being initiated in about ?1880 AD, at an undetermined period of time after the initiation of the Haeawi channel; in either case, Dobani residents co-operated with the residents of the adjacent Tani parishes of Taibaanda and Balete. The gradual extension of the Hagia was not completed until about 1920, when it was linked to the Haeawi channel. Use of the wetland gardens can be presumed to have begun in tandem with the drainage of these two channels, but there was a definite expansion of activity within the wetland centre between ?1913 and about 1932 when large-scale drainage of the Dobani wetlands appears to have been abandoned. Since the 1950s there has been a series of sporadic wetland garden projects, with individual or adjacent blocks in use in 1959 and 1978. A major re-clearance of the Haeawi and Hagia channels in 1991 presages a return to use of parts of the Dobani wetlands.
CASE HISTORY 2. Iba Haeawi area (Tani Hagu).

The mythic origins of Hagu clan lie to the west in the Lebani basin and, ultimately, amongst Tsimali-speakers of the Lower Strickland river area. Within the Haeapugua basin, most Hagu clan agnates are resident at Waolaanda as yamuwini to Tani and are descended from Pali-Hogoyawi, whose father, then residing with Bogorali at Haeapugua, married Ngari-Hewago’s daughter and eldest child, Taya. Hogoyawi (GEB: 1825) is held to have begun the process of swamp drainage at Waolaanda, presumably after at least 1845 AD, though his gardens were restricted to the immediate dryland margins of the swamp. Of his many sons, Pali-Giwa, Pali-Ambua, Pali-Pama, Pali-Pari, Pali-Hiwaligo, Pali-Nganego and Pali-Waigo, all born (though of different mothers) within the GE range 1860 AD - 1885 AD, are identified as having dug most of the drain network in the wetlands between Waolaanda and the Tagali river, assisted by Dali-Pelego (Gobiya tene, married to a Tani Hebaria woman; GEB: 1863 AD), from 1880 at the earliest and more probably after 1890; their crucial role in the excavation of the Haeawi iba puni secured for them control over the wetland area on the Tani side of the drain. The next three generations of Hagu, including individuals such as Pelego’s son Demindi (GEB: 1898 AD), Pama’s son Damintimu (GEB: 1898 AD) and Damintimu’s sister’s husband, Palari (Haro tene, Hagu yamuwini GEB: 1883 AD) in the first generation, Palari’s son Tumbu (EB: 1929 AD) in the second, and Tumbu’s sons in the third, have all gardened in the strip of wetland blocks along the southern side of the Haeawi iba puni.

Use of the Hagu wetlands appears to have been virtually uninterrupted from the initial phase of drainage after 1880 until the 1940s, with continuous "infilling" or "tightening" of the ditch network and re-clearance of existing drains. In about 1922, Dali-Demindi (GEB: 1898), who was married to a Dobani woman, Lebai, set about draining a series of garden blocks, in an area known as "Tola", along the centre stretch of the Haeawi channel, just above its junction with the Hagia. Dobani disputed Demindi’s right to garden the Tola land, claiming that Walubu-Mara (Dobani Palia tene; GEB: 1853 AD) had earlier dug drains in the Tola area. A Dobani tene recalls the origins of the war:

Ani biyagola, o wai tene, o mbabu unu tola mbaria ayu unu ti pirimiyaogo.
The cause of the war was Tola garden down there which you went down to just now.

Pirimiyaogo iba Haeaa o domarimiyaago anu, Ngolo iba puni wia yagi,
Tola obago garere, tiqua Demindi Tola layagola.
Tola lies over there between the Haeawi river and Ngolo’s iba puni drain; Demindi Tola they [Hagu and Hebaria] called it [i.e. belonging to Demindi].
O Hebaria tinaga, tiqua Mara Tola lowa.
Hebaria said it was theirs, but we called it Mara Tola [i.e. belonging to Walubu-Mara].
Obagoriani keba yalu yu Dobani puwa gana walu hearia.
Dobani had taken digging sticks over there and were digging a gana ditch.
Tanime wai bopene...
Tani shot [first] and started the fight...

Walubu-Mabira, 9.1.91, 90/2A:170-226

After heavy casualties had been sustained, on the Dobani side in particular, the war ended in truce, with Hagu retaining the disputed land.

1. Note that it is not Taya’s status as the oldest (haguene) of the Tani siblings that accounts for Hagu’s presence along Tani’s external boundary, but rather her status with respect to her full brother, Hebaria, the eldest of Hewago’s sons, who thus stood in an aba relationship with Hogoyawi’s children.
Tumbu recalls the abandonment after the 1941/42 famine of those blocks farthest into the swamp, adjacent to the Haeawi-Hagia junction, an area that has not since been reharvested for gardens. At some point after the 1959 AP coverage, which shows only two reclaimed wetland Hagu blocks close to the dryland at Waloanda, there was a further phase of wetland drainage and gardening in the Hagu area, which terminated in 1975. This was co-ordinated jointly by Tumbu and his aba, Demindii's son Gangoee (Gobiya tene, Tani Hebaria and Dobani yamuwinii; EB: ?1938). The 1972 oblique AP coverage confirms Tumbu's recollection, clearly showing three of the Hagu swamp centre blocks in use. A further round of drain clearance and gardening was initiated early in 1978; a single block is shown in use on the 1978 AP coverage, shot later that year, illustrating the sequential process in which garden blocks, usually lying in series alongside an iba puni, are drained together and then brought into use one after the other. There were no wetland blocks in use in the Hagu area between 1989 and 1992.

In summary, the drainage of the Hagu wetlands appears to have taken the following course: drainage of the wetland margins as an extension of the dryland network from a date no earlier than ?1845; major wetland drainage from a date no earlier than ?1880 but lasting, probably sporadically, until about 1942; and finally, two recent phases of wetland centre drainage and use from the mid-1960s until 1975 and again from 1978 until about 1985.

CASE HISTORY 3. Torogopugua / Iba Bombowi / Ngolo Punii area (Tani).

The large swamp area between the Hagu gardens along Haeawi iba puni and the Herebe Punii channel is owned jointly by several Tani sub-clans, including Lebe, Eli, Tabayia and Abiya, and a lineage of Hubi clan (resident in Tani parish as Lebe yamuwinii); that part of the swamp closest to the Tereba and Tagali, which is almost permanently inundated, is known as Torogopugua. Ngoari-Laya (Tani Lebe; GEB: ?1814), Ngoari-Habolima (Tani Lebe; GEB: ?1834), Darama-Gelaya (Pi tene, Tani Lebe yamuwinii; GEB: ?1815), Abu-Tiga (Wenani tene, Tani Lebe yamuwinii; GEB: ?1815) and Uguma-Pali (Yangali tene, Tani Lebe yamuwinii; GEB: ?1834) are identified as amongst the first individuals to drain gardens along the immediate edge of the swamp in the area around the Bombo source. There is general agreement that the central wetland area was first gardened by Uguma-Pali's son, Uguma-Ngolo (GEB: ?1869 AD). Ngolo excavated an iba puni channel (now known as "Ngolo Punii") for the Bombowi river, starting from its junction with the Tereba and working up towards the Iba Bombo stream resurgence at the base of Lagale Mandi ridge. Other named wetland gardeners of this period in the Ngolo Punii and Embo Punii areas include Abu-Payabu (Wenani tene, Tani Lebe yamuwinii; GEB: ?1850 AD), Darama-Ayu (Pi tene, Tani Lebe yamuwinii; GEB: ?1849 AD), Ngoari-Gugubaga (GEB: ?1860 AD) and Ngoari-Erele (both Tani Tabayia tene), Ngoari-Yomo (GEB: ?1853 AD) and Ngoari-Bagju (GEB: ?1860 AD) (both of Tani Wangane), Ngoari-Giya (Tani Abiya) and Pi-Mandiga (Tani Abiya yamuwinii; GEB: ?1859 AD). The range of GEBs for these individuals suggests that this phase of wetland gardening could not have been much earlier than the late 1880s or early 1890s.

Ngoari-Paiaba (Tani Lebe; EB: 1907 AD) claims that he was about 8 years old when he saw Uguma-Ngolo digging Ngolo Punii, which would date that event at about 1915. This could be taken to indicate that Ngolo is remembered as a senior man co-ordinating this first drainage event in 1915 or, more probably, that the event witnessed by Paiaba in 1915 was a second or later phase of drain clearance and reuse by Ngolo of the same area. Walubu-Bolangaya (Dobani Palia tene, Tani Eli yamuwinii; GEB: ?1893 AD), Darama-Aio (Pi tene, Tani Lebe yamuwinii; GEB: ?1884 AD), Abu-Arogo (Wangane tene, Tani Lebe yamuwinii; GEB: ?1885 AD), Ngoari-Buruli (Tani Lebe; GEB: ?1889) and Ngoari-Obara (Tani Lebe; GEB: ?1884), all of a later age cohort than the first group of drain-diggers above, are identified as some of the individuals who took part in this post-1915 phase of drainage and gardening in the Ngolo Punii area.
Almost two decades of continuous gardening around the Ngolo Puni area followed the 1915 drainage until the swamp centre gardens were abandoned in the mid-1930s. Paiaba claims that the wetland garden drains were destroyed during a war between Walaba (Tani and Hiwa) and Telabo during the early 1930s; he is adamant that there were no gardens in the area from this time until the most recent phase of major wetland gardening which is clearly visible in both the 1972 and 1978 APs as a set of some 20 adjacent reclaimed blocks. Since the ?1915-?1930 wetland gardening phase in the area, the water had returned to neck-high levels in the blocks around Ngolo Puni. This latest phase was initiated by Paiaba's son, Ngori-Dagiabu (EB: 1942 AD) who, with the assistance of some 30 men from Hebaria and Lebe, cleared Ngolo Puni in about 1970. The swamp centre gardens in this drainage phase were also maintained for approximately a decade before they were finally abandoned; certainly, only three years after the 1978 AP series, by the time of the 1981 oblique AP series, the Ngolo Puni area blocks had been abandoned. They have not been reused since.

Brief mention must be made of the use of an isolated set of three blocks in the Torogopuagiu swamp centre area during the late 1950s, visible in the 1959 AP coverage (Figure C10). While most of the drainage projects described in this Appendix involved labour groups of 20 or more and usually resulted in the drainage and use in series of between about 5 to 20 blocks, individuals and their families were also capable of staging the reclamation of quite small areas, which they drained and maintained without wider assistance. The three swamp centre blocks in use in the 1959 APs are widely acknowledged to have been the work of Ngori-Mandiga (Tani Boroba; EB: 1918). In interview, Mandiga confirmed this, adding that his father, Ngori-Hiraya (GEB: 1883), had previously maintained gardens in the same blocks; also that his grandfather, Ngori-Yumogo (GEB: 1838-1843-1848), had been the first of his ancestors to have gardens anywhere in the swamp.

In conclusion, the following chronology is proposed for wetland use in the Iba Bombo / Ngolo Puni area of Haepuagiu: partial drainage and use of the wetland margins from no earlier than ?1854, followed by a major initial phase of drainage of the wetland centre after about ?1890. Use of the wetland blocks drained by Ngolo Puni may have been virtually continuous from this point until their abandonment after war in the early 1930s, with two distinct age cohorts involved in gardening in the area. There followed a long period of disuse until about 1970, when blocks were drained and maintained until approximately 1980; since then, there has been no wetland reclamation in the Iba Bombowi / Ngolo Puni area.

CASE HISTORY 4. Mabu Gobe and the Iba Gobe area (Dumbiali and Telabo).

Leaders of the clans of Luguni and Tambaruma, the former residents of the current parishes of Telabo and Dumbiali respectively, claim that there was no drainage or garden use of the wetland areas of these parishes prior to the Tani-Tambaruma war. Dabura-Pago (GEB: 1812 AD) and Dabura-Gurubu (GEB: 1805 AD), the leaders of the Tambaruma lineages that returned after the war to live at Dumbiali with their Tani aba, are held to have dug the first channel for the Gobe river that extended beyond the dryland margins; this presumably took place some time after they had both attained adulthood, by about ?1832, and after the GE date for the Tani-Tambaruma war of ?1835 (Appendix C3). Even then, the river channel, which marked the boundary between Telabo and Dumbiali parishes, went only as far as the width of one or two blocks before diffusing into the swamp. From this point, subsequent generations of their descendants co-operated with Telabo residents in extending the Gobe iba puni, block by block, increasing their garden area in strips the width of a block each time.

I do not have the means to attempt a general review of wetland use in this area, but can describe in some detail the history of use for one particular block, known as Mabu Gobe (located in Figure C4). In the late 1920s or early 1930s, a work group that
included Ngoari-Gcjama (Tani Dindiago tene; GEB: ?1894 AD), Baru-Irari (Yobiya tene, Tani Hebaria yamuwinin; GEB: ?1895 AD), Ngoari-Haeawigo (Tani Tabayia tene; GEB: ?1885 AD), Hulugu (Tani Tabayia yamuwinin; GEB: ?1889 AD), Galube (Tani yamuwinin; GEB: ?1905 AD) and Ngoari-Gula (Tani Dindiago tene; GEB: ?1890 AD) extended the Gobe Puni channel beyond the point of its current junction with Iba Diriba as far as the Mabu Gobe garden, which they then drained and used for the first time. Mabu Gobe was certainly in use during 1934, when the Fox brothers passed through the southern part of Telabo parish, but was abandoned in approximately 1938 during a major earthquake. In 1954 or 1955, shortly after the establishment of Tari station in 1952, some of the sons of this first work group, led by Kamiali Gojama (EB: 1929), Abiale Hulugu (EB: 1924) and Nigiba Galube (EB: 1940) cleared out the old drains at Mabu Gobe and gardened there for several years. Finally, in 1989, Kamiali again organised the redrawing of Mabu Gobe. At the time, Mabu Gobe was the garden farthest into the swamp on the southern side of the Tereba river; the block was still being used in October 1992, though its crops had been pillaged and destroyed during the war between Telabo and Tani earlier that year.

The Gobe channel was not finally linked to the Tereba channel until the late 1950s, in an event co-ordinated by a group of young Telabo and Dumbiali men, including Tabayia-Togoli (Dabamu tene, Telabo Hogobia yamuwinin; EB: 1931) and Dabura-Endeli (Tambaruma Gurubu tene, Tani yamuwinin; EB: 1936); certainly the channel was completed by the time of the 1959 AP coverage.

In summary, the first attempts to channel the Gobe river appear to have taken place shortly after the Tani-Tambaruma war, in about ?1840. Further extension of the Gobe channel seems to have been a very gradual process, in which the channel was lengthened only as far as was necessary to bring a further strip of blocks into use along the existing wetland/dryland margin. The Gobe channel reached the Mabu Gobe area in the late 1920s or early 1930s, but was not finally joined to the Tereba river until the late 1950s.
APPENDIX C7

A SURVEY OF ARCHAEOLOGY IN THE TARI REGION

This appendix briefly reviews the available archaeological material from the Tari region and its immediate surrounds. A summary of the history of archaeological research in Southern Highlands Province is given in Section A3.1. Most of the archaeological sites of the Tari region, together with details of their locations, are listed in Appendix C8, and the artefacts collected from these sites are listed in Appendix C9. Locations for most of the sites are shown in Figures A4, C28 and C31. Further details of the excavated sites and of the radiocarbon results from these excavations are given in Appendices C10 and C11, respectively.

Megafauna

The Tari region is currently the richest source of megafaunal remains in New Guinea. An earlier discovery of the holotype of the zygomaturine diprotodontid *Hulitherium tomasetii* at the Pureni mission airstrip (LAC) in the Haapugua basin (Williams et al. 1972, Flannery and Plane 1986) was matched on the eastern side of the basin by the discovery in 1987 of a *Hulitherium* mandible at the LOB site. In the course of my fieldwork, the LOB site was excavated without further remains being uncovered, but specimens of *Protemnodon tumbuga*, previously known only from fragments at the Nombe rock-shelter site in Simbu Province (Flannery, Mountain and Aplin 1983), were excavated from the nearby LOG and LOK sites (Appendix C10); further *Protemnodon* material was also recovered from a road cutting near Koroba (LLA) and similar discoveries of large bones have been reported in the course of garden activity along the Dalipugua and Mogoropugua swamp margins (LOR, LOS). Together with material recovered recently from the spoil of alluvial mining operations at Mt Kare (QGC), these new finds have all been formally described by James Menzies (Menzies and Ballard 1994). Although the Pureni megafaunal material is credited with an age of 38 000 BP on the basis of a radiocarbon date (Williams et al. 1972), this now appears to be a considerable underestimate (Haberle 1993; see Chapter C3); as yet no reliable dates have been determined for any of these finds, nor is there any suggestion of human association, though this has been demonstrated elsewhere in the Highlands region at Nombe rock-shelter (Flannery, Mountain and Aplin 1983).

Rock-shelters

Archaeological survey in the Highlands region has traditionally focused upon the identification of potential cave and rock-shelter sites as a means of establishing preliminary chronological "control" over a region (e.g. White 1972). The limited value of such an approach in the reconstruction of broader patterns of land use and their social contexts is discussed in Section A2.3; there is a role, however, for the deeper chronological frameworks supplied by cave deposits, and potential sites were recorded and, in some cases, briefly tested. As the Tari region limestones are relatively young and well-protected, cave development is not particularly advanced. However, cave formation is progressively more pronounced towards the west of the region, with more caves found in the Koroba and Lebani areas than around Tari (Dyke n.d.), including spectacular multilevel phreatic caves along the southern fall of the Muller Range (James 1974, ATEA 78 1980). Thus, the most promising cave sites all lie to the west of Haapugua, including the Lake Kopiago sites (LAJ, LAK, LAL, LAM, LAN, LAO) explored by White (1974), the Waiya Egeanda cave (LKP) in the Nagia river gorge (Landsberg and Gillieson 1979, Dyke n.d.) and Yurika Egeanda (LSS) in the headwaters of the Nagia river catchment (Dyke n.d.).

White tested the deposits of most of the Kopiago area caves that he visited but the deepest of his test pits yielded only 50 cm of deposit and no samples were submitted for
dating. The only western cave site tested in the course of my fieldwork was the site of Waya Egeanda (LCQ) at 2360 m in the Lebani basin. A pit dug at the cave entrance exposed an apparently shallow cultural deposit of only 35 cm, though the possibility that the basal sterile yellow soil caps further cultural deposit needs to be explored. Samples from the test pit returned two radiocarbon dates that were apparently inverted (Appendix C10); I suggest that the older date of 1230 ± 180 BP (1420 (1160) 770 cal BP) (ANU-8808) is valid for the lowest unit of the known cultural deposit. As occupation as early as 5440 BP (ANU-1015) has been demonstrated for cave sites at altitudes of up to 4000 m elsewhere in New Guinea (Hope and Hope 1976), the Waya Egeanda date is unlikely to represent early use or occupation, even of the high altitude Lebani basin, though it is currently the earliest archaeological date for occupation of the western Huli and Dana areas.

At Haapaugua, marginal overhangs along the length of Lagale Mandi ridge serve occasionally as sleeping spots for hunters and watchful pig owners, or as refuges for family groups and pigs during wars or police raids. They are also favoured as repositories for both cranial and post-cranial remains of ancestors which are coated in red ochre and, in the case of skulls, painted with specific designs. The most promising of these overhangs, the shelter of Embo Egeanda (LOL) in Wangane sub-clan land in Tani Taibaanda parish, provides a 14 m² floor area and is still used as a night shelter but also served, until very recently, as an ossuary. A small trench, 135 cm in length and 50 cm wide, was excavated to a maximum depth of 40 cm, but yielded only 25 cm of cultural deposit, of which only the lower 10 cm was fully consolidated. An ash sample from the upper layer of this consolidated unit returned a date of 610 ± 130 BP (780 (630,610,560) 420 cal BP) (ANU-8307), implying a date earlier than this for initial use of the shelter. Fragmentary human remains, largely cranial, mandibular and dental, and fragments of red ochre and cowrie shell were found through the full depth of the site, suggesting continuity both in the function of the shelter as an ossuary and also in the nature of the materials, ochre and cowrie, used in association with mortuary rituals at contact. The promise of much deeper deposits in the vicinity of Haapaugua, though not immediately bordering or overlooking the basin floor, is contained in the limestone hills between the Haapaugua and Yaluba basins and at the cave of Tamoli Egeanda (LNH), situated in a small doline in the hills in the southeastern corner of Tani Taibaanda parish, which was visited by Haberle but not by myself.

Rock Art

None of the figurative rock art common to most areas of the Highlands has been identified in the Tari region. Figurative rock art has been recorded in the Kopiago basin (LAJ), the Strickland river valley (LEZ, LFA, LFB, LOW, LOX, LOY), the Porgera valley (QCB) and in numerous sites to the east and southeast of Tari. Elsewhere in the Highlands region a close relationship between the distribution of barkcloth and figurative rock art is evident and it is interesting, in this light, to note that barkcloth was produced within or traded into each of these areas, but not within or to the Tari region1. Despite fairly intensive surveys in the Tari region of cave, shelter and cliff locations by myself and others, the only painted rock art known is that associated with ritual performances, which consists of the heavy application of red ochre to large surfaces of cave walls and roofs and to cliff faces. The interior surfaces of the cave that constitutes the inner sanctum at the dindi pongone gebeanda site of Gelote (LDQ) are almost entirely coated in red ochre; other sites with this form of rock art include Guana Egeanda (LNG) in Munima parish in the Haapaugua basin and Embo Egeanda (LOL), where there are patches of red ochre smeared across the rear wall of the shelter.

Another form of rock art is currently unique in New Guinea to the Tari region.

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1. Thus barkcloth caps worn by Tinali-speakers of the lower Strickland gorge are decorated with designs similar to those recorded at the Strickland valley rock art sites (Peter Dwyer and Monica Minnegal pers.comm.; see Appendix C10: sites LOW, LOX, LOY).
Digital fluting in what was formerly soft montmilch deposited on the walls of two cave sites, Kalate Egeanda (LOT) at Haapugiua and Waya Egeanda (LOQ) in the Lebani basin, is very similar in form to the parietal art described from cave sites in South Australia (Bednarik 1986). The panel of parietal art of Waya Egeanda is only 7.6 m from the mouth of the cave, but the larger panel at Kalate Egeanda is approximately 200 m from the entrance and was discovered only in the course of a recreational caving trip in 1989. A more detailed description of both art panels is provided in Appendix C10; the more immediate relevance of these sites is the interesting possibility, based on purely formal similarities alone, that this art may match the Pleistocene antiquity proposed by Bednarik for the South Australian sites. The floor beneath the Kalate art panel had been undercut and there was no scope for excavation; the older date from the test pit at Waya Egeanda of 1420 (1160) 770 cal BP (ANU-8808) may provide a terminus post quem for the art there, but further excavation would be required to extinguish the possibility that deeper deposits at the site might contain earlier cultural levels.

Stone Artefacts

Collections of stone artefacts from the Tari region made both in the course of my fieldwork and previously by other researchers have revealed a range of material forms common across much of the Central Highlands region of Papua New Guinea. From amongst this range, five principal categories of stone artefact can be distinguished: large core tools (conventionally described as "waisted" and "tanged" blades), ground axe blades, stone carvings, other flaked stone artefacts and cooking stones. The nature of these five categories in the Tari region and their occurrence in collections deriving from surface surveys are briefly reviewed here.

Waisted and tanged blades

Waisted and tanged blades are a significant element in the stone tool industry described for New Guinea, with waisted blades constituting the bulk of the artefactual evidence at the earliest occupation site on the island, at Bobongara on the Huon Peninsula (Groube et al. 1986), and associated at numerous other sites with Pleistocene levels (White, Crook and Ruxton 1970, Bulmer 1977); a review by Bulmer (1977) of the form and distribution of these artefacts suggests that their use extended from the Pleistocene until approximately 6000 BP. Although no large core tools have been recovered from securely dated archaeological contexts in the Tari and adjacent regions, the presence of a number of large core tools, including a waisted blade retrieved from the disturbed Tongoma site (LAI) near Lake Kopia, a tanged blade acquired in the Tari area (LL1) and another tanged blade recovered in the course of a surface survey at Waloanda (LSH) in the Haapugiua basin (see Appendix C10: LSH site, for a fuller description of this artefact), is suggestive of a late Pleistocene or early Holocene antiquity for human occupation of the Tari-Kopiago region.

Ground axe blades

6000 BP is also the earliest date cited for ground axe or adze blades in New Guinea (White with O'Connell 1982:190), suggesting that the earlier core tool technology employed to produce large chopping tools was comprehensively replaced by a ground-blade technology. Stone axe blades were still widely employed in the Tari region until the late 1950s, when access to steel tools through the government station at Tari saw the rapid and near-complete abandonment of all stone tool use in the area. As the abandonment of stone tools essentially followed after the local establishment of a colonial presence, large numbers of stone axe blades were sold to administration officers, missionaries and tourists, rather than being discarded or retained. The stone blades employed by Huli fall into two broad categories: poor-quality blades produced

2. This claim is further strengthened by recent finds of large core tools at a number of sites along the southern fall of the Highlands immediately to the southwest of the Tari region (Minnegal 1991, Swadling and Hope 1992).
from local stream sources and much finer, though often smaller blades imported from quarry sources to the east and north-west (Ballard 1994). Table C4 lists the different types of blade recognised by Huli, illustrating the significance for Huli of source, rather than physical form or size, in identifying blades; of particular interest is the fact that abandoned blades uncovered while digging gardens are reworked and identified as blades of "local origin" (dindi ayu), irrespective of their true origin.

**Stone mortars and pestles and ritual stones**

Stone mortars and pestles and stone carvings are almost ubiquitous within Highland New Guinea east of the Strickland river and are present in great numbers within the Tari region. Huli regard all of these artefacts as ritual items, classing them together with a wide variety of forms of natural stone as liru ritual stones. Table C5 lists the categories employed by Huli to identify different forms of ritual stone. The technological complex of stone mortars and pestles and other forms of carved stone is a persistent archaeological mystery in the New Guinea region, with no indication to date of a likely centre or centres for their manufacture and few finds from securely dated contexts with which to establish a chronology for their production and use. Certainly the date of their production within or transfer into the Tari region exceeds the reach of Huli history, as Huli deny their status as human artefacts and have no sense of the presumed prior functions of such artefacts as mortars and pestles; in fact mortars (as ni tangi: "hats of the sun") are linked not to pestles but rather to naturally occurring rounded cobbles (ni habane: "eggs of the sun") traded from the Kopiago region.

Until the 1950s, liru were held largely within sacred liruanda or gebeanda enclosures, where they were focus of a wide range of performances in which the stones would be coated with red ochre and covered with pig grease or blood. The modern recovery of liru in the course of gardening activity almost invariably serves to identify the presence of former ritual sites; the numbers of liru in these sites can be gauged from a recent incident at Halere, a former gebeanda site in Dobani parish at Haeapugua, where the landowner filled three large coffee sacks with liru cleared from a single garden block, which he then proceeded to reduce to rubble for use as cooking stones.

**Flaked stone tools**

Huli flaked stone tool technology is similar to that described for the neighbouring Duna (White and Dibble 1986, White, Modjeska and Hipuya 1977, White and Thomas 1972) and western Mendi-speakers (Bartlett 1964, Sillitoe 1988), reflected in the regional homogeneity of the terms for stone flake scrapers (Huli, Duna: are; west Mendi: are or aeray). The functions of are appear to have been limited principally to the production of arrow shafts, axe hafts and bow staves, the shredding of cane fibre, finer decorative carving on such objects as arrow shafts, the paring of bone and the drilling of shell. Like stone axes, flaked stone tools were largely abandoned during the 1950s, their functions assumed by glass and steel implements, though during my fieldwork period a number of men persisted in making and using flake scrapers which they preferred over steel or glass for the manufacture of bow staves and arrow shafts.

Raw material for the production of flaked stone artefacts is widely available in the form of chert cobbles. Certain stream beds with particularly high quantities of chert cobbles, identified as " quarry" sources, are present in each of the major basins. Modjeska (n.d.) and White (1974) have identified four such quarries amongst Duna-speakers in the Yawinena valley and a further two in the Upper Tumbudu valley. The highest of these, at Iba Yokona on Garua clan land, is also used by Huli-speakers. The

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3. White (White with C'Connell 1982:190-192) notes that mortar fragments have been recovered from levels dating between 3000 BP and 5000 BP at Waftek and NFV sites, and that their apparent absence from sites above 2000 m further implies a pre-Ipomoean antiquity.

4. A collection of liru donated to Father Paul Farkas at Dauli High School contains an illuminating sample of the sorts of materials deemed to be liru: an uncounted total collection includes 23 stone clubheads, 5 fossils, 37 ni habane and 10 stone carvings of various types, together with a large number of naturally occurring but unusually formed stones.
Huli sources, five of which I visited, generally lie along the uplifted eastern margins of the basins where deeply incised stream channels provide a regular source of cobbles; this is certainly the case in the Lebani, Mogoropugua, Dalipugua and Haepugua basins where, in broad terms, the larger the channel, the deeper its incision into the ridgeline and the greater the supply of cobbles. Little value is placed on these sources, and access to cobbles is and was formerly freely available to or through any individuals with ties of kinship or friendship to residents of the parish in which the sources are located. On the eastern side of the Haepugua basin, the major sources are both located in Dobani parish at Hundubalua, in the upper reaches of the Hagia stream and at Iba Arugu; the garden blocks on the fans at the bases of these streams are themselves important secondary sources of raw material.

Cooking stones
The fifth category of stone artefact, cooking stones (*tole*), reflects the Huli practice of cooking larger meals in steam ovens lined with pre-heated stones. A preference for certain types of stone and a particular size range is exercised. Though suitable material is widely available, the best cooking stones in the Haepugua basin are said to come from Iba Darama in Hiwanda parish; like chert cobbles, these are made freely available to anyone prepared to carry them away.
APPENDIX C8

A REGISTER OF ARCHAEOLOGICAL SITES OF THE TARI, LAKE KOPIAGO AND PORGERA REGIONS OF SOUTHERN HIGHLANDS AND ENGA PROVINCES

This Register lists some of the sites in the Tari, Lake Kopiago and Porgera regions of Southern Highlands and Enga provinces that are documented on the National Site Register (NSR) maintained at the National Museum of Papua New Guinea; the list given here excludes most of the ethnographic artefact collection sites, concentrating largely on archaeological sites (LAB-LLI, QEB-QGC) and those sites initially recorded in the course of my doctoral fieldwork in the Tari region (LLA, LMA-LSX).

Codes:

NSR code: Three letter site code documented on the National Site Register (NSR).
Field code: Codes used by fieldworkers to distinguish sites in the field.
Grid reference: Refers to the 1:100 000 topographic map series for Papua New Guinea.
Location name: Refers to the local name for the site, or the immediate area.
Basin: Refers to the general basin or valley location of the site (Ur: Upper; Lr: Lower).
Site 1: Refers to the type of site, under the following codes:
    C - Cave or rock-shelter site
    O - Open site
Site 2: Refers to the type of site, under the following codes:
    A - Rock art site
    B - Burial site
    C - Artefacts or other material noted or collected
    E - Excavation
    F - Chert flake source
    M - Megafauna site
    R - Ritual site
    S - Surface site
Comment: Provides details of related reference works and site contents.
<table>
<thead>
<tr>
<th>NSR code</th>
<th>Field code</th>
<th>Grid reference</th>
<th>Location name</th>
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<th>Site 1</th>
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<th>Comment</th>
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<tbody>
<tr>
<td>LAB</td>
<td>-</td>
<td>YU0529</td>
<td>Hambuali</td>
<td>Komo</td>
<td>-</td>
<td>c</td>
<td>Stone mortar collected at Hambuali parish, Komo.</td>
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<tr>
<td>LAC</td>
<td>-</td>
<td>YU024534</td>
<td>Pureni</td>
<td>Haepapua</td>
<td>O</td>
<td>MEc</td>
<td>Hulitherium type site (Flannery and Plane 1986).</td>
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<tr>
<td>LAF</td>
<td>-</td>
<td>XV650950</td>
<td>Arekana</td>
<td>Ur.Tumbudu</td>
<td>O</td>
<td>F</td>
<td>Chert source in Hareke parish (White 1974:7).</td>
</tr>
<tr>
<td>LAH</td>
<td>-</td>
<td>XV661035</td>
<td>Lane</td>
<td>Kopiago</td>
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<td>ESc</td>
<td>Ditch fill dated to 430+/−110 BP (NSW 100) (White 1974:3).</td>
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<tr>
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<td>Waisted blade collected (White 1974:5).</td>
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<td>Tage</td>
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<td>BE</td>
<td>Shelter with &gt; 15cm deposit containing carbon (White 1974:6).</td>
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<td>Shelter with &gt; 50cm deposit containing carbon (White 1974:6).</td>
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<td>Shelter with 20-30cm deposit (White 1974:4).</td>
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<td>AR</td>
<td>Dindi pongone gebeanda site in Dagabua parish, including the painted inner sanctum cave (Goldman 1979, Frankel 1986:21, Figure 5). Gebeanda ritual site (Hondobe clan).</td>
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<td>R</td>
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<td>&quot;Human footprint&quot; in rock in Kelabo area.</td>
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<td>R</td>
<td>(Hook 1963; White 1969)</td>
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<td>-</td>
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<td>C</td>
<td>A</td>
<td>(Hook 1963; White 1969)</td>
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<td>B</td>
<td>Burial cave in Dilini parish (Hook 1963)</td>
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<td>Waiya</td>
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<td>-</td>
<td>Large dry cave site with apparently substantial but untested deposit (Landsberg and Gillieson 1979).</td>
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<td>Haepugua</td>
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<td>-</td>
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<td><em>Gebeanda</em> of Aroma and Pi Tungube clans.</td>
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APPENDIX C9

ARTEFACTS COLLECTED DURING 1988-1992 FROM ARCHAEOLOGICAL
SITES OF THE TARI REGION, SOUTHERN HIGHLANDS PROVINCE

This Appendix lists the artefacts recovered from archaeological sites in the Tari region of Southern Highlands Province between 1988 and 1992; also listed are those artefacts of megafaunal remains collected by others but discussed in this thesis (LAB - LAM, LLI). The artefacts are listed by site, following the site code system documented on the National Site Register (NSR) maintained at the National Museum of Papua New Guinea; the list given here excludes the ethnographic artefacts collected during this period, concentrating largely on those collections made during the course of my doctoral fieldwork in the Tari region.

Codes:

NSR code: Three letter site code documented on the National Site Register (NSR).

Field code: Codes used by fieldworkers to distinguish sites in the field.

Artefact codes - refer to the numbers of artefacts of each the following artefact types seen or collected at the site (* = more than 10 items of this category collected at the site):

AXES - ground stone axe blades and axe blade fragments

FLAKES - flaked stone material of all types

LIRU - sacred stones of various types

MISC - miscellaneous materials, including megafaunal remains, cooking stones, shell, ochre and whetstones

Comment: Provides details of related reference works and site contents.
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APPENDIX C10

ARCHAEOLOGICAL SITE DESCRIPTIONS

This appendix provides details of the principal sites located during the course of my fieldwork. The individual site records are listed alphabetically by their three-letter National Museum Site Register codes, from LOA to LSH. A full listing of these and other sites of the Tari region is provided in Appendix C8. Further analysis and comparison of the results from the different sites are provided in Part C. Locations for the sites of the Haepugua basin are mapped in Figure C28; locations for those sites in the Dobani/Waloanda area of Haepugua are shown in Figure C31. Soil colours refer to the Munsell colour chart series; pH values were obtained with a Raupach Indicator set.

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<td>Figure LOY/1 Rock art designs, Strickland site 3</td>
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<td>Figure LSH/1 Tanged blade, Waloanda Garden 10 (LSH site)</td>
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Excavation of this site in October 1989 was undertaken in an attempt to explore reports of buried hearths and modified stakes uncovered during recutting of a *gana* ditch at the base of the Munima hills along the northern margins of the Haeapugua swamp. The landowner, Alua Tiya, recalled having earlier seen this material as a young boy in the 1940s when he first cleared the ditch and suggested that the wood fragments and charcoal were evidence for the presence of an early house. After clearance and draining of the site, a 10 m² area, consisting of five 2 x 1 m² trenches with intervening baulks, was opened up from the edge of the modern ditch. This quickly established that the stakes were supports along the wall of a former ditch feature, running along the same course as the modern *gana*.

A sequence of two distinct layers of slumped, reworked clays falling in towards this feature overlay a layer of white clay, capping a basal dark brown organic unit containing massive woody material in the form of buried tree trunks, leaves and seeds (Figure LOA/1); these were identified by Alua as *ayaga* (*Areca* sp.) and *anga mundiya* (*Pandanus brosimos*). A single successful 14C result, on a sample of charcoal from the lower of the two layers of reworked clay, was as follows:

ANU-7623  LOA/c  10980 ± 590 BP
           14250 (12900) 10980 cal BP (100%Pr.)

A further outcome of this excavation was the auger and level transect extended from the site down towards the swamp, which established the presence of a buried clay fan extending into the swamp from the Munima hills. A depth for this clay of 3 m at a point 55 m upslope from the LOA site thinned down to about 1 m at the LOA site, before tapering out entirely a further 71 m into the swamp (Figure LOA/2). Viewed in this light, the ANU-7623 14C result may be taken to date part of the process of formation of this white clay fan.
Figure LOA/1: Section, west wall, squares G6 and G7, LOA site.
Figure LOA2: Auger transect from Munina hills towards swamp centre.
LOB(i)
ITALIA'S SITE, DOBANI PARISH, HAEAPUGUA
YU058546

The LOB site, situated in the wetland margins of Dobani parish, consists of an extensive section exposed in the wall of a gana ditch and two excavations of garden features (LOB(i) and LOB(ii)). The discovery in 1987 of the mandible of an extinct Huliherium diprotodon by Hubi-Iralia (Tigua tene, Dobani yamuvini), in the course of recutting a gana ditch, led me to attempt to identify the fossil layer and to recover further fossil material through excavation of the LOB(i) site in November 1989. A 9 m² area was opened along the northern side of the ditch and excavated by spade and trowel to a depth of 90 cm; no further fossil material was recovered but the fossiliferous bed was tentatively identified by Italiia. During this initial excavation, both walls of the ditch were cleaned back, exposing a basal sequence of white clay and black organic layers, referred to collectively as the "white clay unit", over a 31 m distance. A pronounced dip in the beds towards the swamp, varying in angle from 10 to 15 degrees, considerably extended the "depth" of this sequence. The exposed sequence, 5.29 m in depth after correction for the effects of the dipping, was recorded along the south wall by me and then extended by Haberle to a maximum corrected depth of 9.13 m with the aid of an auger! Figure LOB(i)/1 is a schematic illustration of the basal white clay unit sequence at the LOB site.

A series of features cut into the uppermost surface of these ditching beds was mapped in profile in 1989 and it was to examine these in plan that a small 2 x 1.5 m area immediately adjacent to the 1989 fossil LOB(i) excavation was opened in January 1991. In the ditch wall, these features were distinguished on the basis of the colour and texture of their respective fills. The two basic fill types common to most of the sites of the Dobani/Waloarada area were first recognised here: an upper dark grey clay infilling features that cut into both a lower light grey clay and the basal white clay layers. The light grey clay infilled features which were cut exclusively into the basal white clays. Further description and discussion of the significance of these different clay units is contained in the account of the LOB(ii) site below and in Part C.

The 1991 site was excavated following the apparent sequence of fills. Below a 5-10 cm topsoil, the surface of the dark grey clay appeared uneven but otherwise featureless. No features were identified within the dark grey clay, which was removed to reveal a level surface composed of light grey clay infilling a partially exposed basal white clay topography. A single feature (Feature A), a straight trench, 150 cm long and 20 cm deep, excavated through the surface of the light grey clay and into the white clay, was infilled with dark grey clay; this ran from NE to SW, sloping downwards in the direction of the swamp. A single flaked stone artefact (LOB(i)/1) was recovered from the dark grey clay fill of Feature A. Removal of the light grey clay exposed a complex white clay surface (Figure LOB(ii)/2), consisting of shallow, interconnected runnels lying between large, deeper pits. One of these pits emptied out via a tunnel, also infilled with light grey clay, running within the white clay. The highest surfaces of the white clay contained a number of small, round pits, typically 5 cm in diameter and 6-9 cm in depth and infilled with light grey clay, which were interpreted in the field as the bases of crop holes dug from within the light grey clay.

1. These corrected depths (b) were calculated assuming a constant 12 degree dip (A) for 5.41 m of exposed section and a further 3.93 m of augered section (c) (where b = c cos A).
Figure LOBi/1: Schematic section of white clay unit, LOB ditch.
Figure LOBi/2: Plan of white clay surface, LOBi excavation.
The LOB(ii) site consists of an excavation extending inwards from the northern wall of the LOB gausa ditch, some 130 m to the south of the LOB(i) excavation; it is named after the owner of the garden in which the excavation was located, Baya Domabe (Tani Ta'byia tene, Dobani yamwini). The LOB(ii) excavation was opened in January 1991 and further extended on two separate occasions, in February 1991 and October 1992, in order to examine the relationship between the dark grey clay- and light grey clay-filled features and one of the tephra bands contained within the basal white clays; a total area of 6 m² was opened over this period.

The basic sequence at LOB(ii) was familiar from LOB(i): a 5-15 cm topsoil overlying a dark grey clay layer infilling features cut into both the basal white clays and an intermediate light grey clay layer, with the light grey clay infilling features cut into the white clay alone. An unusual element in the stratigraphy observed in the ditch wall is the behaviour of a distinct tephra band, 1-2 cm in thickness and cemented to form a hard "pavement", which appeared to form part of the basal white clay unit (as Layer 12 in Figure LOB(i)/1). This tephra band rises at an angle of 12 degrees from the southern end of the site, running parallel to the other layers of the white clay unit. However it then breaks the surface of the white clay, entering the light grey clay virtually intact as a continuous cemented pavement. Only on contact with the base of the dark grey clay is the form of the tephra pavement substantially disrupted, though fragments of the pavement appear in the dark grey fill of features cut into the light grey clay. It was obviously important for the status of the features filled with light grey clay to observe the behaviour of this "transgressive" tephra in plan and successive phases of excavation thus pursued the tephra to the west as it dipped down into the white clay unit.

Removal of the topsoil exposed a lightly undulating dark grey clay surface. No differentiation was observed within the dark grey clay, which was excavated to the even surface of the light grey clay. A number of features infilled with dark grey clay were cut into the light grey surface, including rounded pits, 9-12 cm in depth, a more sinuous, bifurcating channel (Feature B) and a straight channel (Feature A) (Figure LOB(ii)/1). The abrupt intersection of Feature B by the straight Feature A channel suggests that the dark grey clay infills features from at least two distinct phases.

When the light grey clay was removed, a complex topography similar to that observed at LOB(i) was exposed, with deep rounded pits linked by sinuous runnel features (Figure LOB(ii)/2). As at LOB(i), tunnels running within the white clay unit, infilled with light grey clay, appeared to connect some of the pit and runnel features. The exceptional features here were two straight channels, Features Y and Z, running parallel to one another along an orientation similar to that of the dark grey clay-filled Feature A; unlike the channel features infilled with dark grey clay both here and at LOB(i), which maintained a regularly formed flat or slightly curved base along their full extent, the bases of Features Y and Z tapered to a crack and fluctuated dramatically in height. At least one of the tunnels appeared to feed directly into Feature Z. At the conclusion of the February phase of excavation, the tephra had been traced to a point in the western corner of the excavation where it lay at the base of Feature A and within the light grey clay fills of Features Y and Z, but appeared set to enter the white clay beneath the light grey features (Figure LOB(ii)/3). However, in the opposite eastern corner of the excavation, the tephra lay a clear 15 cm above the base of Feature Z.

The 1992 extension, undertaken with the assistance of Jack Golson, sought to track the dipping tephra in order to confirm whether or not it disappeared entirely into the white clay unit beneath the light grey clay. This was found to be the case. Removal of the white clay layer overlying the dipping tephra also confirmed that the tephra subsequently conformed to the general angle of dip of the other components of the white clay unit. Significantly, Feature Z tapered out to nothing shortly after the tephra
dipped beneath the feature's base into the white clay.

The only attempt to date features at LOB(ii) was a sample of charcoal taken from the base of Feature A, which returned the following result:

ANU-7807  LOB(ii)/a  410 ± 170 BP  
           660 (490) 240 cal BP (83% Pr.)

This result is taken to date the broad period of use and the event of infilling with dark grey clay of Feature A.
Figure LOBii/1: Plan, light grey clay surface, LOBii excavation.
Figure LOBii/2: Plan, white clay surface, LOBii excavation.
Figure LOBii/3: Section of north-west and south-east walls, squares E5, E6 and E7, LOBii excavation.
The LOC site, like the LOB site 130 m to the north, consists of an excavation of buried garden features associated with an extensive ditch exposure; the site is named after the block's owner, Hulu-Tumbu (Tani Hagu yamuwini, Haro tene).

A tilted basal sequence of organics, tephas and white clays exposed over a 146 m length of gana ditch walls was identified in the course of work at LOB in 1989 and was recorded after the face of the southern wall had been cleaned back. At LOC, this basal sequence extends into the swamp from the 2-3 m high face of the bench scarp that runs along parts of the eastern margin of Haeapugua. A pronounced dip in the beds near the top of about 12 degrees downwards in the direction of the swamp gradually corrects before proceeding to tilt back upwards, correcting again to become level at the end of the recorded section. The most likely origin for the bench scarp, which runs parallel to the limestone ridgeline of Lagale Mandi, is deformation following tectonic uplift; possible causes for the dipping in the basal white clay beds, discussed in further detail in C3.3, include deformation associated either with uplift activity, differential pressure loading under clay and peat, or a combination of the two.

The basal sequence at LOC, illustrated schematically in Figure LOC/1, is almost identical to the sequence recorded at LOB (see Figure C32 for a direct comparison), adding an extra white clay layer beneath the organic woody layer at the base of the LOB sequence but lacking the uppermost tephra/white clay pair at the top of the LOB sequence. A detailed description of this basal sequence is given in Figure LOC/1. As at LOB, the basal white clay unit is truncated along a level roughly parallel to the current soil surface. The relative positions of the light grey and dark grey clay units, and the unusual behaviour of the tephas of the basal unit, are similar to those observed at LOB, as the following discussion of the excavation illustrates.

The excavation was positioned 2 m to the south of the LOC ditch wall, initially to examine in more detail the most promising of the features exposed in the ditch wall section. This feature consisted of an apparent channel in cross-section, infilled with light grey clay grading to a darker grey/brown clay towards the base of the channel. Fragments of cemented tephra appeared dispersed within the light grey clay fill, but in a narrowed slot at the base of Feature 3, a distinct and level band of uncemented tephra was observed; interestingly, though this lower tephra appeared "fresh" and loosely structured in 1989, by the following year it had hardened to a cemented pavement where exposed. A 7 m² trench was opened by spade in December 1990 in order to locate this channel feature; unfortunately, once exposed, the base of the channel proved to be only slightly higher than that of the modern gana ditch and the garden's owners expressed their unwillingness for work on this scale and at this depth to continue and required that the channel be immediately refilled.

Attention was then focused on the dark and light grey clay-filled features nearer the soil surface and a further 9 m² area was excavated by trowel in January 1991 to examine these features. From a level surface, a variable depth of topsoil, ranging from 8 cm to 22 cm, was removed, exposing a dark grey clay surface with a prominent linear depression running from north to south across the site. Two flaked stone pieces were recovered from the topsoil layer, one each from Squares E5 and E7.

In the course of removing the dark grey fill, two channels (Features A and B) and two round holes (Features C and D), all infilled with dark grey clay, were revealed (Figure LOC/2). It is possible that the two channels represent contemporaneous features, as Feature B lies at a conventional right-angle to Feature A; no difference in the fills of the two features could be discerned. A sample of charcoal from the basal fill of Feature A returned the following result:
ANU-7808  LOC/a  540 ± 90 BP
           670 (540) 430 cal BP (95%Pr.)

The light grey clay was then excavated; although distinct features infilled with light grey clay could be seen in the walls of Feature A, there was nothing to distinguish between the fill material of these features and the overlying light grey clay. The light grey clay-filled features could thus be documented in plan only as they appeared on the surface of the basal white clay. This offered a complex topography, with an interconnected net of thin, shallow runnel features (Feature Y) positioned parallel and at right angles to one another and seemingly draining into a deeper, sinuous channel feature (Feature Z), partly obscured by Features A and B; Figure LOC/2 illustrates this topography for Squares E7, F7 and F8. A sample of charcoal from the base of Feature Z in Square D5 produced the following result:

ANU-7809  LOC/b  15210 ± 370 BP
           18840 (18130) 17340 cal BP (100%Pr.)

The lower of the two tephras seen in the section of the large light grey clay-filled Feature 3 in the wall of the LOC gana ditch was not identified in the initial trench or the subsequent excavation. The upper, cemented tephra, which had been visible in the centre of the Feature 3 fill, was also present in the excavation; here it appeared both in a highly disturbed and fragmentary form within the dark grey clay fills of Features A and B, largely as slump material from the adjacent light grey clay walls of these features, and as a slightly more coherent band within the light grey clay. In areas where the light grey clay was thinnest and the basal white clay unit at its highest points, the tephra formed an intact cemented pavement, positioned within the light grey clay, 0.5-1 cm above the white clay surface (Figure LOC/3). Away from these white clay crests, the tephra band dipped and fragmented over the light grey clay-filled features in the white clay surface.
Figure LOC/1: Schematic section of white clay unit, LOC ditch.
Figure LOC/2: Plan of white clay surface, squares E7, F7 and F8, LOC excavation.
Figure LOC/3: North-east wall section, squares E7 and F7, LOC excavation.
LOD
MUNDIYA'S SITE, TELABO PARISH, HAAEAPUGUA
YU054515

The LOD site consists of an extended section exposed in the wall of a newly
cleaned dryland gana ditch on the dryland slopes of Telabu parish, approximately 8 m
above the western margins of Haapugua swamp; it is named after the owner of the
garden and digger of the gana. A record was made of the section as the basis for a
comparison with the basal white clay stratigraphy of the LOB and LOC sites on the
eastern side of Haapugua. Figure LOD/1 is a schematic illustration of the stratigraphy
at LOD.

Briefly, the LOD sequence matches quite closely the sequences from LOB and
LOC, with which it is compared in Figure C32: two woody organic layers at the base of
the sequence, separated from one another by a plastic clay unit composed of layers that
vary in colour from white to a dark brown, are in turn overlain by a sequence of
alternating thick layers of white clay and thin bands of oxidised tephra. The lowest of
these tephra bands immediately caps the uppermost of the woody organic layers; a thin
carbonised crust along the contact surface between the organic layer and the tephra
band suggests that carbonisation of the organic surface may have been a consequence of
the tephra fall. No significant artificial features were noted in the section.
Figure LOD/1: Schematic section, LOD site.
LOE
MANGOBE'S SITE, TELABO PARISH, HAEAPUGUA
YU050515

The LOE site, named after the landowner, consisted of a testpit dug in November 1989 to trace evidence of a hearth and of sharpened posts emerging in the spoil of a recut gana ditch (reported rather optimistically by the landowner, as evidence for an early house). The site was located in a swampy hollow perched on the dryland slopes of Telabo parish and proved too wet, even after drainage around the planned excavation area, for anything larger than a testpit. A 1 x 1.2 m area was opened along the existing ditch wall and excavated to a depth of 1.3 m.

A single cooking stone fragment was recovered within the top 32 cm of the disturbed upcast, but no further cultural material was identified. An underlying layer of upcast white clay mixed with peat, gravel and woody fragments capped a 67 cm unit of peat, composed of a uniform finely rooted, felted light brown peat at the top, an intermediate layer of peat containing distinct banding with fewer roots, and then an increasingly sticky dense black peat at the base (Figure LOE/1). Beneath the peat unit, and presumably contributing to the sticky quality of the lowest peat layer, a basal white clay, partly gleyed, extended to the base of the testpit at 130 cm. The base of the site was augered, producing a further 85 cm of white clay, beneath which a dark brown organic layer with a massive woody content extended another 125 cm, up to and presumably beyond the full reach of the auger.

A dense band of charcoal at 94 cm, near the base of the peat unit, gave the following result:

ANU-7625 LOE/b 1400 ± 70 BP
1420 (1300) 1160 cal BP (99%Pr.)

This provides a date shortly after the initial onset of peat development at this particular location; given Haberle's (1993) observations on the rarity of evidence for fire events in non-anthropogenic contexts (prior to 30 000 BP) in the Tari region, the charcoal band presumably reflects anthropogenic firing at this location at a date of about 1300 BP.

On the far side of the swampy block containing the LOE testpit, another newly recut gana ditch had exposed a channel feature in section, notable for the presence of what was identified in the field as a continuous band of Tibito ash within the brown peat into which the channel feature was cut, the ash thus predating the channel feature; a basal white clay unit immediately underlying the peat was observed dipping downwards in the direction of the swamp.
Figure LOE/1: Schematic section, LOE excavation.
Between 1989 and 1990, a new L-shaped gana drain was dug into Urupupugua swamp in the Tari basin, enclosing an area of Dobani clan land identified as Mabu Yangome for cattle pasture. Owners of the land are Ibale and Heba and Ibale's sons Mulungu and Agilu. Twenty men, amongst them Ginagago, a Dobani tene whom I met in 1989, worked on the drain and were paid between 400 and 500 kina altogether for their labour. When I returned in 1990, the drain was completed, extending through onto the dryland slopes.

Unusually, for so long and fresh an exposure, no earlier drains or other features were visible anywhere along the full extent of the drain, which was over 400 m in length. Figure LOF/1 illustrates the stratigraphy exposed in the drain walls. From the base of the drain, at a depth of about 2 m, a black organic layer, with a rich massive woody content, extends upwards to 53 cm beneath the surface. This basal black organic layer is capped by a light brown clay unit, at the base of which occasional purnaceous stones were observed. Above the light brown clay is a thin 1.5 cm-thick layer of light tan clay. At certain points along the drain, another discontinuous, light tan clay layer is positioned within the light brown clay. The top 46 cm of the profile, extending above the uppermost light tan clay layer, consists of a dark brown silty/clayey peat. At the base of this peat, immediately above the uppermost light tan clay layer, there is a thin but distinct band of charcoal fragments. Within the peat, at depths of between 37 cm and 40 cm, there is a discontinuous band of olive green tephra nodules. The tephra nodules and the charcoal band were both sampled, with the latter returning the following result:

ANU-7624    LOF/a    1240 ± 60 BP
            1280 (1170) 1060 cal BP (95%Pr.)

The tephra, which was tentatively identified in the field as Tibito (on the basis of texture and colour), has not yet been characterised. The result on the charcoal band suggests that the tephra could be either Tibito or Olgaboli, though the absence of a second tephra within the peat suggests that Tibito, which is generally the thicker of the two deposits and the only one visible in the Tari region, is the more likely identification; the charcoal band, which lies very close to the date for Olgaboli tephra (Appendix A3), conceivably represents the effects of fire initiated by hot ash.

Allen and Wood (1980:344) had previously proposed that Urupupugua had been formed (and the forest represented by the basal woody organic unit destroyed) by a massive mudflow along the Alua river, emanating from Mt Ambua. On the basis of oral accounts of a mudflow on the Alua river that occurred well within genealogical recall, they dated this event to between 1860 AD and 1880 AD. Insofar as it relates to the formation of Urupupugua, this date must now be discounted, given both the 14C result reported here and the presence above the woody organic unit of a tephra that must be either Tibito or Olgaboli. But the model for the formation of Urupupugua may still hold: Allen and Wood note that the fan deposits on the western slopes of Ambua are composed of a series of overlapping mudflows, some of which are overlain by Tomba tephra which is dated to >50 000 BP. Urupupugua may well have been formed by one of these mudflow events, but it must date to before at least 1200 BP.

The absence of any evidence for drainage at Yangome is intriguing, given its location in the centres of the densely populated Tari basin and its extremely limited catchment area, factors which might both be expected to promote wetland reclamation and use. The light brown clay unit and light tan clay layers, presumably inwashed sediments from the surrounding hills, probably reflect a series of dryland clearance events dating shortly before about 1200 BP. Why a swamp that is evidently easy to drain had not apparently been drained prior to contact is problematic; certainly there is
no evidence on the various aerial photographic coverages of Urupupugua for abandoned drainage networks in the swamp, comparable to those evident at most other Tari region swamps. At present, other than the possibility that the Yangome drain represents an insufficient sample and that peat development may have obscured all surface traces of earlier drains, the only explanation that comes to mind is that Urupupugua was formerly regarded in much the same way as the minor swamps at Haeapugua: as a central locus of fertility and focus for ritual and not, therefore, as potential agricultural land.
Figure LOF/1: Schematic section, LOF site, Urupupugua swamp.
LOG
MABIRA'S SITE, DOBANI PARISH, HAEAPUGUA
YU055551

The LOG excavation was undertaken primarily to retrieve fossil megafaunal remains after their discovery by local landowners and to train a team of students from the University of Papua New Guinea; observations were also made on the nature of the basal clay stratigraphy and, incidentally, on drain features within the peat overlaying the fossiliferous clays.

The LOG site is located in Kobumabu garden of Dobani parish in the Haepugua Basin; Figures LOG/1 and LOG/2 illustrate the plan and profile of the site, the layout of the excavation and the relationships between the modern and archaeological drain features. The site was first located in the late 1920s by Walubu-Mabira (Dobani tene) when, as a boy of about 15 or 16, he recut a small gana drain (Drain A) prior to constructing his first house and pig hut. He dislodged a number of bones from the wall of the ditch, amongst which he recognised pelvis and longbone fragments; he remembers breaking a longbone with his hewe digging stick. At the time, he assumed them to be the remains of a Bogorali clansman, killed and thrown into the ditch during the Tani-Bogarali war of the 1890s (Appendix C4, Narratives C2 and C3). Anxious to avoid any dispute, Mabira pushed the remains back into the wall of the ditch and recut the ditch along a slightly altered angle (Drain B).

In 1989, the garden was brought back into use, the area that includes the site being gardened by Tone, a non-agnicatic cognate of Dobani clan, resident in Dobani parish. In re-excavating the gana, Mabira and Tone deliberately altered its course before reaching the 1920s findspot so as to avoid further disturbing the bones (Drain D); nevertheless, they struck numerous other bones, some of which (bones of the hand or foot, said Mabira) they threw over into the adjacent garden (these could not subsequently be located). They kept one fragment [LOG/1] and later, in the course of constructing mounds for sweet potato in September 1990, recovered a second fragment from the surface of the fill of the 1920s gana [LOG/2]. Mabira retained both fragments and offered them to me in October 1990, showing me the precise location of the site.

During December 1990, a 10 m² area of the site was excavated, with a further 2.25 m² excavated in February 1991 during a visit to Tari by James Menzies. An initial metre square test pit located the 1920s gana and three fragments of a single vertebral bone [LOG/3] were recovered from the gana fill. The excavation was then extended over an area sufficient to recover the bulk of the remains, without destroying too much of an actively producing garden. Initially, some problems were experienced with drainage of the site, but an exceptional spell of fine weather and re-cutting of the 1989 gana and the larger iba puni drain into which it flowed improved conditions to the extent that rapid removal of uncovered fossils became necessary to prevent them drying out. The fill of the stretch of the 1920s gana exposed by the excavation was removed and sieved through a 1 cm mesh. All finds were given an individual site number, and photographed in situ; locations were noted in three dimensions and the finds were then removed in batches of between three and twelve and bagged in water from the site before excavation proceeded.

The basic stratigraphy at LOG is illustrated in Figure LOG/3 and consists of a garden topsoil, 13 cm to 31 cm deep, developed on between 13 cm and 45 cm of friable, black peat. At the base of this peat layer, two thin bands of soft, highly plastic olive grey clay bracket a much more dense peat cap; the possibility that these bands represent the light grey and dark grey clays known from the other sites of the Dobani / Waloanda area was not considered in the field. The white, or more accurately pale yellow, clay unit that extends from directly beneath the lower olive grey clay band to the base of the site is minimally 20 cm deep and is composed of a complex series of very finely stratified bands of reworked ash, freshwater shell, and organic material. Individual bands vary in thickness from less than 0.2 cm to a maximum of
approximately 5 cm. Although the topsoil and peat layers are essentially level, this white clay unit dips down towards the southwest at an angle which increases from 9 to 14 degrees (the dip is not shown in Figure LOG/3, which is schematic). Comparable dips have been recorded elsewhere along the margins of Haepapugua for this white clay unit.

pH values for the site profile range from 7 for the topsoil to 7.5 for the peats and 8.5 for the white clay, reflecting the continuous percolation of water from the adjacent limestone ridge through the site and probably accounting for the fine preservation of both bone and organic material in the site. Roots extend through the full profile and were apparently responsible for some of the post-depositional damage to a number of the larger bones.

The disposition of the fossils appears to conform to the dip in the white clay unit, as a distribution of the vertical plots for each bone reveals a dip of between 10 and 12 degrees. Though some of the larger fossils traversed a number of different bands, the vast majority lay within a single white clay band; a common observation, on removing fossils, was that a thin and discontinuous organic mat was located at a depth of 0.5 cm to 1 cm beneath the fossils. Intact leaves and a number of seeds were recovered from some of the larger organic bands and may prove identifiable.

Artificial features in the site, none of which were associated with the fossils, consisted of three drains, shown in Figure LOG/2. Though drain A apparently predates drain B, the lapse of time between the two is not likely to be great as the fills were essentially identical. It is probable that drain B represents the re-excavation of drain A within the same gardening phase, and this can readily be identified as Mabira’s second 1920s gana. Drain C appears to be intersected by drains A and B, though it may have articulated with an earlier, thinner and shallower gana subsequently enlarged by these more recent drains. In size and form, drain C matches closely the shallow de gana ditches which serve more as boundary markers than actual drains in contemporary Haepapugua gardens. Given the abundance of carbonised organic material in both the topsoil and peat which are the sources for the ditch fill material, carbon dating of the fills was not considered worthwhile.

It is worth noting here that there was no evidence at LOG for the earliest phase of features known for Haepapugua, present at sites LOB, LOC, LOI and LOJ, which is typically infilled with a light grey clay and excavated into the basal white clay common to all of these sites.

A list of the fossil finds is given in Menzies and Ballard (1994: Appendix), giving tentative identifications made by James Menzies. At present, all but three of the identifiable bones appear to derive from the same individual, currently described as a large, but primitive, extinct Protemnodon species, tentatively assigned to Protemnodon tumbuna (Menzies and Ballard 1994). Bones [5], [72] and [97] are probably bird remains.

Assuming the presence of only one individual, it would appear that the carcass is more or less in situ. Post-depositional disturbance has served to dismember the skeleton: only the component parts of bone [18] were found in a state of articulation. There is little pattern to the distribution of the body parts: the two mandibles ([31] and [70]) lie at opposite ends of the exposed area, and the various ribs are equally scattered. It is not yet clear why this should be the case. No obvious evidence was noted, either during excavation or in the process of initial description, for scavenging marks on the bones. The lack of uniformity, in the orientation of the long bones in particular, and the fact that the bones generally appear entirely unsorted by either size or weight suggests that although the presumed depositional environment was fluvial or lacustrine, no water current of any significance can have influenced the distribution of the body parts.

Other than the drainage features, the only artefacts identified or retrieved from
LOG were a single flake (LOG/101) found in the spoil of the topsoil from square 0S1W, and an unusual conical ground stone fragment (LOG/102), snapped at one end, from the fill of the 1920s gana in square 0S0W.

No samples for dating were recovered from the LOG site, but the grounds for asserting an antiquity in excess of 50 000 BP for all of the basal white clays are discussed in Chapter C3.
Figure LOG/1: Plan of LOG and LOK megafauna fossil sites.
Figure LOG/2: Plan and profile of ditch features, LOG site.
Figure LOG/3: Schematic section, LOG site. (bedding dip not shown)
LOH
BIRIMANDA, MUNIMA PARISH, HAEAPUGUA
YU032548

Birimanda is a major *gebeanda* ritual site, jointly owned by the clans of the Yari and Yami pluralitys (Appendix B6: Gen.1). The site is located on the highest and widest section of the levee that has developed along the Tagali river between the swamps of Haepugua and Emepeugua (Figure C1). Figure LOH/1 illustrates a plan of the extent of the site and the former disposition of some of the ritual features of the ritual centre, and a profile of the levee. The site was formerly divided into two sections, with Yari phratry performances contained between the streams Iba Ulumo and Iba Tenagua, and those of Yami phratry between Iba Tenagua and Iba Gelomi. Three huts constituted the ritual centre. These included:

i) the *liruanda*, a small, fully enclosed hut in which the sacred *liru* stones were housed between performances,

ii) the *kamianda*, a rectangular house with doors at either end, where officiants ate and discussed the identity of appropriate *dama* spirits for each performance, and

iii) the *mboluanda*, a small *andira* shelter with a hearth upon which pork oblations were cooked.

All three constructions were dismantled or allowed to disintegrate after the last ritual performance at Birimanda, which took place late in the 1950s, when ECP missionaries newly established at Waleté forbade the performance of further rituals. Of the large grove of *guraya* hoop pines (*Araucaria cunninghamii*) that formerly covered the site, some of which are visible in a 1961 photo (Hoad 1961), only two mature trees remain, the rest having been logged.

No test pits or excavations were attempted at the site, but examination in January 1991 of a natural exposure along the banks of the Gelomi stream, which intersects the levee immediately to the north of the Birimanda ritual site, provided access to the levee stratigraphy. Figure LOH/2 illustrates this section. As might be expected of a levee section along a river which floods in most years, soil boundaries are indistinct except in the uppermost 20 cm where finely interlay layers of soil, silt and sand mark the most recent flood events. The most significant break beneath this appears at about 94 cm, where an indistinct boundary marks the transition from overlying silty sand to a silty/sandy clay.

Scattered charcoal is evident throughout the section to a depth of 125 cm, but particularly abundant in two bands between 60 and 66 cm, and 103 and 122 cm. In cleaning back the face of the section, a hearth containing several cooking stones was exposed between 23 and 39 cm: no boundary corresponding to this event was visible in the profile. The fire-blackened stones were heavily marked with traces of red ochre, suggesting to those Huli present with me that the hearth was associated with ritual performances in which ochre, mineral oil and cooked pig fat are applied to ritual stone artefacts and other stone objects. Samples of ash and charcoal were collected from the hearth and from the two dense charcoal bands and submitted for radiocarbon dating. All three samples (ANU-7803, ANU-7804, ANU-7805) returned results which extend to the modern, presumably reflecting contamination by the movement of floodwaters through the full depth of the levee profile; only one of the samples, from the uppermost charcoal band, returned a result which can be calibrated:

ANU-7804 LOH/b 190 ± 80 BP
320 (280, 170, 150, 10, 0) m cal BP (96% Pr.)

Although the intercepts extend to the modern period, the result is of some value for my
purposes, in that it suggests that the upper 60 cm of the Tagali levee at this point of the river have been deposited during the last 320 years.
Figure LOH/1: Plan, Birimanda ritual site (LOH).
Figure LOH/2: Schematic section, Birimanda levee.
LOI
WALOBI, TANI (TAIBAANDA) PARISH, HAEAPUGUA
YU058544

The Walobi site is located in Tani (Taibaanda) parish, on ground owned by Hagu subelan. When it was excavated in January 1991, the Walobi site was in the first swamp block beyond the existing boundary between reclaimed garden blocks and the wetlands. My intention in excavating this site was to test the degree to which the stratigraphic units and the relationships between them identified in the LOB and LOC sites extended into the swamp.

A 2 x 1 m test pit was opened some 15 m into the swamp from the nearest garden block drain. After removal of a 15-20 cm topsoil, a light grey clay was immediately exposed (Figure LOI/1); the dark grey clay known from the LOB and LOC sites closer to dry land was evident here only as thin (1-2 cm), discontinuous patches in the hollows of the white clay surface topography. A sample of charcoal from one of these patches was collected, returning the following result:

ANU-7806 LOI/a        2050 ± 210 BP
                  2500 (1990) 1520 cal BP (98%Pr.)

The light grey surface, which was essentially level, was broken only by a single dark grey clay-filled feature, an oval hole 9 x 12 cm in area, sloping at the base from a depth of 2 cm below the white clay surface to a maximum depth of 6 cm. Removal of the light grey clay revealed no further penetration by dark grey clay. A scattered pattern of orange staining or discoloration evident on the light grey clay surface may represent traces of a weathered tephra.

The light grey clay unit consisted of two separate layers of light grey clay intersected by an undulating 1-2 cm band of cemented tephra pavement, dipping slightly towards the swamp. The tephra was broken at six points by hole features infilled with light grey clay (Figure LOI/2). This clay fill darkened noticeably towards the base of each feature, a characteristic of the light grey clay fill in features noted at both the LOB and LOC sites; this was certainly not intrusive material from the dark grey clay unit, but more probably the result of some form of organic staining or sorting of elements of the feature fill.

Removal of the tephra pavement revealed a second, thinner layer of light grey clay overlying a basal white clay unit. The surface topography of the white clay consisted of irregular, sinuous channels no longer than a metre in length, terminating in deep oval or circular pits (Figure LOI/3). None of the conformity in orientation of the white clay features witnessed at the LOB(ii) or LOC sites was evident here. There was also no correspondence between the positioning of the light grey features intersecting the tephra pavement and the white clay features below.

The relative simplicity of the LOI test pit offers an interesting perspective on the more complex problems of the LOB, LOC and LOJ sites. The dark grey clay unit associated with the clearest channel features at the other sites is largely absent at LOI, suggesting that gardening activity in the dark grey clay phase did not extend far into the swamp beyond the current limits of established reclamation. Although the limited area exposed at the LOI site does not extend sufficiently to trace the stratigraphic origins of the tephra pavement, I am inclined to identify this tephra as one of the four tephras known from the basal white clay unit, and to interpret its presence within the light grey clay at LOI as the result of a process of gradual replacement of white clay by light grey clay similar to that interpreted for the LOB and LOC sites.
Figure LOI/1: East wall section, LOI site.
Figure LOI/2: Plan of tephra pavement surface, LOI site.
Figure LOI/3: Surface of white clay unit, LOI site.
The LOJ site in the Hiritibite locale is situated on a former pig droveway (*nogo duguduguy*) in Hagu subclan land in Tani (Taibaanda) parish; the block which constituted the droveway is currently the location of a pig-hut (*nogoanda*) but no longer serves its former function of moving pigs from dryland houses to wetland forage areas. A 2 x 1 m² area was opened near the centre of the droveway in January 1991 in an attempt to determine the maximum possible age of the use of the area as a droveway (presumed to post-date the most recent use of the block as a garden), and as a means of further exploring the sequence of dark and light grey clay fills identified at the LOB and LOC sites.

A thin topsoil, 2 cm to 14 cm in depth contained a single piece of flaked stone. The transition from the topsoil layer to the dark grey clay unit was gradational, moving with increasing depth from a more friable dark soil to an increasingly plastic dark grey clay. No internal differentiation in the dark grey clay was noted during excavation, but the surface of the underlying light grey clay revealed the presence of two intersecting channel features (Figure LOJ/1: Features A and J); the shallow angle of intersection and the difference in depth of the channel bases suggested that these two features were not contemporary with one another but, even subsequently in section, the fills of the two features were very hard to tell apart. Eight hole or pit features were also identified in the surface of the light grey clay. A patch of charcoal lying at the base of Feature A was sampled and submitted for dating, producing the following result:

ANU-7800 LOJ/a 2390 ± 230 BP
2940 (2350) 1880 cal BP (100%Pr.)

At the southwestern end of the site, fragments of cemented tephra were found both settled on the surface of the light grey clay and dispersed across a depth range of 24 cm within the dark grey clay.

Excavation of the light grey clay unit revealed the presence, midway within it, of an incomplete cemented tephra pavement dipping lightly downwards in an ENE direction, presumably the source of the cemented tephra fragments found within the dark grey clay (Figure LOJ/2). The pavement was noticeably most intact where it was positioned immediately above the underlying basal white clay unit, and dipped markedly above the deeper light grey clay-filled features in the white clay surface.

The base of the light grey clay unit revealed three distinct blocks of what was interpreted initially as white clay, lying above a layer of very dark, carbonised organic clay covering much of the remaining extent of the site. This thin 2-7 cm organic layer was removed, exposing a surface topography of basal white clay broadly similar to that uncovered at the LOB and LOC sites, consisting largely of connected pit and shallow runnel features (Figure LOJ/3). A more unusual element of the white clay surface was the much deeper and, by comparison with other light grey features, straighter channel feature (Feature Z) running from northeast to southwest across the site. The fill of Feature Z consisted of light grey clay, grading significantly in colour towards a darker grey at the base of the feature, but without any evident change in texture; this colour gradation was presumed to reflect a higher organic content settled at the base of the fill. Feature Z was quite unlike any of the light grey clay-filled features seen at other sites, with its straight side walls and level base resembling more closely the characteristics of some of the dark grey clay-filled features (e.g. Feature A at site LOB(i)).

The other unusual element of the white clay surface was the presence of the three blocks of apparently disturbed white clay, each of which capped the thin band of carbonised organic clay. These three white clay blocks contained none of the fine banding evident in all of the basal white clay units at this and other Haeapugua sites and
were interpreted on site as upcast from the channel and runnel features, capping a buried organic soil which was thus presumably the contemporary soil surface. At one point along the length of Feature Z, one of the "upcast" white clay blocks appeared to have slumped subsequently over part of Feature Z; the dark carbonised organic clay band also extended at several points, from beneath the capping "upcast" white clay blocks on either side of Feature Z, into the light grey clay fill of the feature (Figures LOI/2 and LOI/3). The observation that the light grey clay extended beneath the dark organic layer in places suggest, in retrospect, that the dark organic layer behaves similarly to the "transgressive tephras" at this and other Dobani / Waloanda sites (see Section C3.2).

The presence of the largely intact if dipping tephra pavement immediately above Feature Z at its northeastern end was inexplicable in terms of my 1991 field model of local stratigraphy, a situation rendered even less clear by its absence at the other end of the same feature.

When samples of the organic band beneath one of the upcast white clay blocks, from its upper 2 cm (LOJ/b) and lower 2 cm (LOJ/c), were submitted for dating, the following results were returned:

ANU-7801 LOJ/b 15820 ± 140 BP
19040 (18710) 18400 cal BP (100%Pr.)

ANU-7802 LOJ/c 17660 ± 150 BP
21550 (21040) 20490 cal BP (100%Pr.)

Concern during the 1990/91 excavation season about the status of the light grey clay-filled features in the white clay surface, given their troubled relationship with the "transgressive tephras", was considerably amplified on receipt of these 14C results. Tentative conclusions on this matter are contained in Chapter C5.

In November 1992, an attempt was made to extend the 1991 excavation in order to consider more closely the junction of the two dark grey clay-filled channels, Features A and J. 14C results from the previous year's excavations had suggested that at least two distinct phases of use were represented within the dark grey clay unit, and further excavation of the LOJ site was proposed as a means of examining the possibility of distinguishing the different phases of use at one site on the basis of fill characteristics. A 2 x 1 m area extension along the southwestern and southeastern borders of the 1991 excavation was opened and excavated with the assistance of Jack Golson. Excavation by trowel proceeded from the topsoil surface to the base of the dark grey clay, with close attention paid to variation in colour and texture. Successive surfaces within the topsoil and dark grey clay were almost impossible to identify except where scattered lenses of charcoal formed a perceptible level; a sample from one of these charcoal lenses at a depth of 6 cm beneath the designated dark grey clay surface produced the following result:

ANU-8754 LOJ/d 440 ± 200 BP
690 (500) 50 cal BP (95%Pr.)

The two channels, Features A and J, were quickly recognised and their walls and bases easily defined. Less easy was the task of distinguishing between the fills of the two features along the plane of their intersection, the only difference noted in the field being that the fill of Feature J was slightly darker than that of Feature A which it intersected and presumably post-dated (Figure LOI/4). Two further samples of scattered charcoal, one (LOJ/e) from the surface of the light grey clay at the base of the dark grey clay, 6 cm lower than and directly beneath the LOJ/d sample and 20 cm northeast of Feature A, and the other (LOJ/f) from the base of Feature J but partly embedded within the surface of the light grey clay, returned the following results:
ANU-8755 LOJ/e  
1210 ± 90 BP  
1280 (1130, 1110, 1090) 960 cal BP (100% Pr.)

ANU-8756 LOJ/f  
1210 ± 310 BP  
1710 (1130, 1110, 1090) 630 cal BP (99% Pr.)

Taken together with the results of the LOJ/a and LOJ/d samples above, this suggests at least three phases of dark grey clay deposition at LOJ: the first from about 2350 BP, represented by the fill of the channel Feature A, the second from between about 1300-1000 BP, represented by the fill of the channel Feature J and the base of the dark grey clay at the eastern corner of the 1992 extension, and the third from about 500 BP or later, represented by the upper half of the dark grey clay in the 1992 extension.
Figure LOJ/1: Plan of light grey clay surface, LOJ site.
Figure LOJ/2: North-east and south-east wall sections, LOJ site.
Figure LOJ/3: Plan of white clay surface, LOJ site.
Figure LOJ/4: Plan and section, 1992 extension, LOJ site.
LOK
TONE'S FOSSIL SITE, DOBANI PARISH, HAEAPUGUA
YU055551

In the process of re-excavating the 1989 gana to drain surface water from the
LOG excavation, further fossil fragments were located at a site designated as LOK and
named after Tone (Dobani yamuwini, Pibe tene), who was then gardening the area; the
location of these finds, relative to the LOG site, is shown in Figure LOG/2. The
discovery here of a third mandible, also identified by Menzies as Protomnodon tumbuna
(Menzies and Ballard 1994), indicates the presence of at least a second individual in
close proximity to the LOG find. Fragments of longbone and pelvis may prove to
derive from the LOG individual, though the presence of most of the diagnostic bones at
LOG within a relatively limited area might suggest otherwise. No attempt was made to
retrieve material other than that thrown up in the course of clearing the gana. Though
located at a depth of about 1 m below the surface, the fossil-bearing layer at LOK
appears to be in an identical stratigraphic position to that at LOG, in the upper 20 cm of
a white clay unit capped by peat.
LOL
EMBO EGEANDA, TANI (TAIBAANDA) PARISH, HAEAPUGUA
YU067540

The Embo or Berabu Nali Egeanda rock-shelter site lies in Tani Wangane land in Tani (Taibaanda) parish, at an altitude of 1690 m on the mid-slopes of the steep Lagale Mandi limestone ridgeline. The limestone bluff that forms the shelter is visible from the Highlands Highway below. The shelter floor consists of a level area 7 m in length and 2 m at its maximum width, from which larger rocks have been removed and placed at the rear of the shelter (Figure LOL/1). A steep talus slope on a 28 degree angle extends downwards from the edge of the floor area. Hearth ash and fire-blackened cooking-stone were present on the current floor surface, together with two human crania and an assortment of post-cranial material at the northern end of the shelter. A further six crania and other post-cranial material were distributed in crevices along the bluff on either side of the shelter; the identities of the individuals are well known to current residents of the area. The site owners suggested that the site had been used more recently for shelter while gardening and as an ossuary over the full duration of traditional recall.

An attempt was made to test the deposit at LOL as it appeared the most promising of the shelter sites along Lagale Mandi ridge, in close proximity to and overlooking the swamp. A trench, 50 cm wide and extending 135 cm in length from a point 40 cm from the rear wall of the shelter, was excavated. Figure LOL/2 illustrates the excavation stratigraphy. Much of the soil matrix through the full depth of the excavation was poorly consolidated and appeared extensively disturbed and reworked. Cultural deposit appeared to terminate at a maximum depth of only 26 cm from the surface, beneath which there extended a poorly consolidated limestone rubble set within a very loose, soil matrix of degraded limestone. No features were identified in the course of the excavation, the individual layers consisting instead of what appeared to be a reworked combination of in situ hearth material and inwashed soil from either end of the shelter.

All of the excavated deposit was put through 20 mm and 10 mm sieves, but the amount of cultural material identified in excavation or on the sieves was remarkably slight: 6 flaked stone pieces, 14 human bone fragments, a single pelvic fragment from an unidentified possum species, 3 perforated cowrie shells and an assortment of red ochre fragments constituted the total assemblage from the site. The human remains, which consisted of 6 teeth, 1 distal phalange, 4 cranial fragments and 3 unidentified fragments, were reinterred when the site was backfilled. Two radiocarbon results on charcoal from units 3A and 5A at the LOL site are available, as follows:

ANU-8307  LOL/3a  610 ± 130 BP
780 (630, 610, 560) 420 cal BP (95%Pr.)

ANU-8308  LOL/5a  190 ± 70 BP
320 (280, 170, 150, 10, 0) m cal BP (99%Pr.)

The apparent inversion of these results is unaccountable but may reflect the generally disturbed character of the site stratigraphy.

If any confidence in the stratigraphic integrity of the site can be maintained, the presence of human remains, cowries and red ochre fragments both above and below the ANU-8307 sample suggests a not inconsiderable antiquity for use of the site as an ossuary and for some continuity in the form of local mortuary ceremony. This may also account for the minimal presence of evidence for other forms of activity at the site: the paucity of flaked stone material and non-human bone suggests that the ceremonial function of the site may largely have excluded use of the site for more mundane activities, at least until the period since contact.
Figure LOL/1: Plan, Embo Egeanda (LOL) site.
Figure LOL/2: West wall section, LOL excavation.
LOM
ALUYA'S SITE I, DOBANI PARISH, HAEAPUGUA
YU058549

The LOM site was tested as part of a general attempt to identify the history of pig
droveway development along the margins of the Haepugua wetlands; it is named after
the block owner, Walubu-Aluya (Dobani tene). A 2 x 1 m test pit was opened on a
former droveway block, then under long grass fallow and in use as a forage area for
pigs. The excavation was terminated abruptly during the first day due to an attack of
typhoid and hepatitis which prevented a return visit until 1992, by which time pigs had
thoroughly ravaged the site; there is thus no full record of the plan or stratigraphy of
the site.

After the grass cover and topsoil had been removed, a layer of dark grey clay was
exposed. No internal features could be identified within this layer, which lay directly
upon and infilled the surface topography of the basal white clay. Two post or crop
holes, infilled with dark grey clay, were distinguished in the surface of the white clay,
from one of which the remains of a wooden post were recovered. The absence of a light
grey clay at LOM was particularly interesting as it confounded my initial theory that the
distinction between the light grey and dark grey clays was largely a function of the
difference in their relative proximity to the basal white clay and the extent of admixture
between this white clay and the contemporary topsoil. The absence of a light grey clay
at LOM thus raised the possibility that the light grey and dark grey clays represented
formative processes that were qualitatively, and not simply stratigraphically or
temporally, distinct.

LON
ALUYA'S SITE II, DOBANI PARISH, HAEAPUGUA
YU057549

The LON site was tested in an attempt to identify the antiquity of use of swamp
margin land for pig droveways (nogo dugudugu). The block consisted of a strip of land
nominated by the owner as a former pig droveway and currently used as a location for
pig huts (nogo ando).

Topsoil was stripped back from a 2 x 3 m area, one metre from the gana ditch
defining the south-eastern side of the block. Test pits in the northern, western and
southern corners yielded only gradational changes in the peat stratigraphy, showing an
increase in clay with depth. A trench, 30 cm in width, was excavated along the SW and
NW sides of the excavation area in order to confirm the stratigraphy identified in the
corner test pits. The water table was reached at 40 cm in the northern and western
corners and at 28 cm in the southern corner. No features were identified either during
excavation or in any of the exposed sections. The excavation was abandoned at this
point.

The limited value of this testpit lies in its demonstration of the rapid decline with
distance from the current dryland margin in the density of buried ditch or other garden
features.
LOO
Tari Gap 1
YU368404

This site consisted of a test pit located in the grasslands of the Tari Gap, 40 m to the southwest of the Highlands Highway, just below the crest of a ridge. A trench was excavated by spade through a small crescentic feature, 160 cm in length, 40 cm wide and partly filled with water but probably drier than usual owing to recent dry conditions. Figure LOO/1 illustrates the section exposed by the trench. A 40 cm peat topsoil contained an olive green tephra at a depth of 10 cm, consisting of a series of small dispersed patches of tephra distributed along a broadly level, but visually indistinct horizon. Beneath this peat was a dark brown carbonised organic layer, 10 cm in thickness; this capped a sequence of clayey volcanic ash bands, varying in colour from white to dark brown and similar to the basal white clay sequence recorded in many of the Haepapagua basin sites, which extended to the base of the profile at a depth of 100 cm, and included, between 80 and 85 cm, a 5 cm layer of tephra. Four samples were taken from the section; of these one sample (LOO/a), from the centre of the dark brown carbonised organic layer, was submitted for radiocarbon dating, yielding the following result:

ANU-8758  LOO/a  8290 ± 90 BP
         9400 (9260) 9140 cal BP (69%Pr.)

This date, which marks the initiation of local peat formation, is taken to represent the onset of anthropogenic fire disturbance in the immediate area of the site.

LOP
Tari Gap 2
YU371404

A section from a second sunken feature in the Tari Gap, immediately opposite site LOO on the north-eastern side of the Highlands Highway, is located in grassland approximately 130 m from the road and 100 m from the forest margin. Figure LOP/1 illustrates the section, showing a similar sequence to that of site LOO. The LOP section reveals a deeper peat topsoil of 46 cm, containing a thin band of olive green tephra between 13 cm and 16 cm, and capping a sequence of banded white and brown clays. The green tephra was sampled, but no samples for dating were taken.
**Figure LOO/1:** LOO site section.
Figure LOP/1: LOP site section.
LOQ
WAYA EGEANDA, LEBANI
XU794655

The cave site of Waya Egeanda consists of a single chamber, some 60 m in length. The entrance to the cave, 3 m in width and 9 m in height and at an altitude of 2360 m, is perched at the head of a small talus slope in one of the numerous side-valleys along the eastern margins of the Lebani basin. From a 2 m-high raised lip at the cave mouth, a dry and fairly level floor extends back towards a small pool in the rear of the cave.

A small test pit, 30 cm x 30cm in area, was dug 120 cm from the cave entrance, on the entrance side of the raised lip. This exposed deposit to a depth of 40 cm, from which three samples were collected for dating. No artefacts were identified within or recovered from the test pit. The stratigraphy, illustrated in Figure LOQ/1, consisted of a 20 cm cover of light brown friable soil, presumed to be a mixture of soil and bat guano, overlying a thin layer of soil, similar in texture but darker in colour and impregnated with charcoal. Beneath this, a further layer of lighter brown soil capped a second layer of dark, charcoal-rich soil. Intruding into this second darker soil layer was a tapering lens of white ash. Beneath 34 cm, the deposit consisted of an apparently sterile yellow soil, composed of degraded limestone; no effort was made to explore the depth of this yellow soil, which may cap further cultural deposits. Plans to return to the Lebani valley and to excavate the site late in 1991 were abandoned after illness.

Two samples were submitted for radiocarbon dating, yielding the following results:

ANU-8808 LOQ/b  1230 ± 180 BP
1420 (1160) 770 cal BP (98%Pr.)
ANU-8809 LOQ/c  300 ± 210 BP
560 (310) m cal BP (98%Pr.)

Within so narrow a test pit, the scope for interpretation is obviously limited, though apparent continuity in the charcoal-impregnated soil from which ANU-8808 is derived suggests that the white ash source of the ANU-8809 sample may be intrusive, with slumping of the soil subsequent to the deposition of the white ash. Nevertheless, ANU-8808 provides a minimum date for exploration and occupation of the high-altitude Lebani valley.

Immediately above the raised lip, 7.6 m from the entrance of the cave, there is a small panel of rock art on the northern wall of the cave. The panel, which is positioned 1.15 m directly above the floor of the raised lip, is 55 cm in width and 80 cm in height. The wall material is a soft calcareous deposit covered in a film of mould. The art consists of a number of parallel series of finger-flutings, broadly similar to those recorded at the Kalate Egeanda (LOT) site, though less distinct. An attempt at a photographic record of the art without the benefit of flash proved unsuccessful; a sketch of the art is reproduced here as Figure LOQ/2.
Figure LOQ/1: Test pit section, Waya Egeanda cave.
Figure LOQ/2: Digital fluting cave art, Waya Egeanda cave.
LOT
KALATE EGEANDA, ARUA PARISH, HAEAPUGUA
YU025576

[Text adapted from Ballard 1992a]

Kalate Egeanda is a large chamber cave located in Arua parish, in the Munima hills along the northern margin of Haeapugua swamp. Possibly the chamber represents a former channel for the Tagali river, before it assumed its current course. Kalate is the focus of a number of local tales, the most popular being that it runs beneath the Tagali river, appearing at an undisclosed location on the north bank. Clans on the south bank of the Tagali have long suspected individuals from the north bank of using the cave to steal pigs and drive them back, unseen, beneath the river. A relatively modern myth, this tale is more an indication of the grudging respect for the courage and witless of thieves, than an account of familiarity with the cave. Few, if any, older Huli could claim any knowledge of the interior of Kalate Egeanda.

The entrance to the cave is a large dry walk-in rift, 20 m from the Tagali river. There has been no mapping of the cave, but successive visits have established that it consists of a single, largely dry, main passage, which runs parallel to the Tagali river for about 400 m. Numerous side chambers have been inspected, but have all proved to be blocked at short distances from the main chamber. The main chamber, which forks and reforms at several points, finally terminates in a maze of small passages, one of which leads to the surface via a tight chimney, 4 m in height (Dyke n.d.). Minor streams are found in some of the lower passages, and light inflows of water from the ceiling at several locations, presumably the inspiration for the stories about the cave passing beneath the Tagali river, have formed a number of small pools.

A panel of rock art, first recognised during a visit to the cave in October 1989 but recorded later, in November 1990, is located approximately 200 m from the entrance, on the wall of a dry, stranded fork. The floor directly beneath the art is in the process of collapsing into a lower chamber with an active stream, and no floor deposit could be found in the immediate vicinity of the art. A small 100 cm-wide area of soft calcite deposit or muntmilch, deposited in solution from a now-dry dripline along the ceiling, appears to have been selected deliberately for the art.

The art consists largely of a single panel, 85 cm high and 45 cm wide (Figure LOT/1), the base of which stands approximately 110 cm from the former floor surface and approximately 350 cm above the floor of the lower chamber. A further single set of three short digital flutes running parallel to the floor beneath the main panel is not depicted in Figure LOT/1. Linear gouges, in parallel sets of three or four, converge towards the base of the panel. Marked indentations at the top of each parallel set of gouges suggest that the fluting was performed with a downwards motion. Some superposition is evident, particularly in the centre of the panel, and variation in the weathering of these cross-cutting sets suggests that the gouges were not produced in the course of a single event.

The gouges are well-preserved, the only defacement of the panel known in 1990 being two small sets of trial impressions, in softer deposits on either side of the panel, made in 1989 (one of these is shown in the lower left corner of Figure LOT/1). Although the deposit around the panel is fairly soft, the interline ridges created by the gouges have undergone dessication, leading to a considerable hardening of the entire gouged area. Shrinkage in the width of the original gouges is presumed to reflect the subsequent reprecipitation of carbonates over the panel's surface which has infilled the gouges with precipitate.

The form, length, and variation in number of the gouges correspond strongly with similar marks ascribed to human agency at southern Australian cave art sites (Bednarik 1986). Bednarik's (1991) critical distinctions between natural and human cave
markings are acknowledged but no obvious non-human explanation for marks of this nature, within a limited area on the wall of a large chamber, can be found at Kalate Egeanda. Some broad conclusions about the possible antiquity of the art and further comparison with similar art at Australian sites are provided in Ballard (1992a).
Figure LOT/1: Digital fluting cave art, Kalate Egeanda cave.
LOU
MBUGUA'S SITE, TANI (TABAANDA) PARISH, HAEAPUGUA
YU062533

This site is located in a reclaimed wetland garden along the Tereba river levee in Haeapugua swamp, on land owned by Ngoari-Mbugua (Tani Wangane tene). The intention in excavating at this location was to obtain a date for the development of the Tereba levee and thus for the channeling of the Tereba river through the wetland centre. Poor visibility due to vegetation regrowth and the closeness of the water-table to the surface prevented any systematic survey for earlier features along the faces of existing drains. Enquiries amongst the owners of garden blocks on the Tereba levee revealed that no-one had seen evidence for early ditches exposed during recutting of the current drain network, though all were aware of such features along the wetland margins. Within an area indicated by the landowner, approximately 40 m from the Tereba river channel, a 2 x 1 m testpit was excavated in July 1991. Although the testpit was located within the driest part of the garden, the water-table was reached at a depth of only 45 cm, at which point the landowner declined permission to proceed further.

No clear breaks were discerned in the stratigraphy of the testpit, nor were any features identified. The stratigraphy consisted of a light cover of topsoil developed upon a light brown silty clay loam, slightly sticky with weakly developed pedds, which extended to the base of the pit where it was increasingly subjected to oxidation and gleying (Figure LOU/1). The silty clay loam, identified by Mbugua as mu ("sand, silt"), is regarded as an exceptionally rich soil for most crops. The oxidised soils are described as hagwa dindi, or hagwa where fully gleyed. Soil pH at 10 cm was 5.

A lens of dispersed charcoal between 40 cm and 45 cm was sampled and submitted for 14C dating, yielding the following result:

ANU-8310 LOU(i)/b 410 ± 270 BP
770 (490) m cal BP (100%Pr.)

While the result is broadly suggestive of the general recency of the sample, the extension to the modern period of the range at two standard deviations renders the date unusable for any more precise determination.

A second visit was made to the LOU site in October 1992 in the (unfounded) hope that the general water-table might have lowered sufficiently to extend the depth of the 1991 test-pit. Instead, a much deeper profile (designated as the LOU(ii) site) was examined; this was exposed at the end of a freshly recut "blind" drain, forming the eastern side of the same garden block and abutting directly onto the banks of the Tereba channel. The form of the drain is itself significant, suggesting that the Tereba actually contributes little to local drainage within the swamp, landowners preferring to drain water from their levee blocks away from the Tereba to other iba puni drains running parallel to the Tereba channel and articulating with the Tereba along its lower reaches.

The stratigraphy exposed at LOU(ii) is illustrated in Figure LOU/2. The profile consists of three units: an upper silty clay loam (Unit 1) divided from an increasingly plastic basal silty clay (Unit 3) by a distinct 80 cm layer of sandy silt (Unit 2). A sharp, even break separates Units 1 and 2, while the boundary between Units 2 and 3 is distinct but wavy. Evidence for oxidation increases with depth through the profile, which extends approximately 30 cm below the current watertable. The intermediate sandy silt I interpreted in the field as marking the base of the Tereba levee, with the basal silty clay indicating the presence of an inwash fan extending from the former mouth of the Tereba channel on the swamp margins. Unit 1 is taken to represent the formation of the levee along the channelled course of the Tereba.

Three charcoal samples were extracted from the freshly cleaned face of the LOU(ii) drain at the points indicated on Figure LOU/2. Samples LOU(ii)/b and
LOU(ii)/c were submitted for radiocarbon dating; the carbon content of LOU(ii)/c proved too small for dating, but LOU(ii)/b was re-submitted for an AMS resolution for which the following result was obtained:

<table>
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<tr>
<th>ANU-8757</th>
<th>LOU(ii)/b</th>
<th>410 ± 90 BP</th>
</tr>
</thead>
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<tr>
<td>(AMS 442)</td>
<td></td>
<td>560 (490) 280 cal BP (99%Pr.)</td>
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</table>

If the interpretation of the profile given above is correct, the channelling of the Tereba river and the development of the levee at this point along the channel must post-date this result.
Figure LOU/1: Schematic section of excavation.

Figure LOU/2: Schematic section of ditch, LOU site.
LOW
SITE 1, ABIMA-YOKONA TRACK, STRICKLAND VALLEY
XV476175

A small panel of painted rock art located on a vertical bluff of unconsolidated material, facing the Strickland river at 330 degrees, at an altitude of exactly 1000 m. The site lies directly along the current foot track leading between the Abima valley to the north and the Yokona valley to the south. Fourteen separate designs, all painted in red ochre, were identified, though most were too poorly preserved for their form to be distinguished. Figure LOW/1 illustrates those designs clear enough to be recorded.

LOX
SITE 2, ABIMA-YOKONA TRACK, STRICKLAND VALLEY
XV475184

This rock art site was reported to me as similar in content to LOW, but was not visited. Apparently it lies on the route of the former track between Ambi and Yokona, lower down on the slope than the current track and the LOW site.

LOY
SITE 3, ABIMA-YOKONA TRACK, STRICKLAND VALLEY
XV474169

Also located above the Strickland river on the Ambi-Yokona track, at an altitude of 1070 m, this site consists of two large adjacent limestone outcrops, 3 m apart at the closest point. Both offer large sheltered areas facing the valley; both floor areas appeared to contain at least some deposit and bore traces of recent use in the form of hearths. The northernmost of the two outcrops has at least nine separate designs painted in red ochre on the back wall of the overhang. All were very weathered, but it was possible to differentiate between two distinct shades of red, one lighter and the other darker. Figure LOY/1 illustrates the clearest of the designs; Design (i), like Design (ii) at the LOW site, appeared to exploit the full length of a smooth area of surface.
Figure LOW/1: Rock art designs, Strickland site 1.
Figure LOY/1: Rock art designs, Strickland site 3.
LSH
GARDEN 10, WALOANDA, TANI (TAIBAANDA) PARISH, HAEAPUGUA
YU061546

In the course of surface surveys in the Waloanda area of Haeapugua (C3.2), an
unusual flaked tool formally resembling an axe blade was collected; the tool is
illustrated in Figure LSH/1. The heavy degree of patination over the full surface of the
tool (with the exception of a single, fresher scar) is suggestive of an antiquity for its
production considerably in excess of that of most of the other artefacts collected in the
Haeapugua basin. On the basis of a hand inspection, the material of the artefact appears
to be a vesicular rhyolite (J.Chappell pers.comm.). A brief microscopic inspection of
the tool by Tom Loy of the Australian National University revealed heavy traces of
black residue, possibly resin, along the central spine of the tool. Starch grains between
3 and 7 microns in width were identified, both imbedded in the black residue and in
great quantity along the working edge of the tool. Heavy crushing along the longer
sides of the tool suggests deliberate blunting to improve the grip of a haft. The narrow
width of the exposed blade inferred from the extent of the haft blunting, combined with
the presence of a large single flake scar along the face of the working edge, imply that
the tool had approached the end of its use life in terms of its original intended function.
Wholly flaked axe blades are highly unusual in contexts from New Guinea post-dating
6000 BP, after which point the working edges, if not the entire blade, are almost
universally ground. A late Pleistocene / early Holocene date is tentatively proposed for
this artefact, though its find context may not match the original act of deposition, given
the propensity of Huli and other Highlanders for re-employing unusually formed stones
in ritual contexts.
Figure LSH/1: Tanged blade, Waloanda Garden 10 (LSH site).
APPENDIX C11

RADIOCARBON RESULTS FROM THE TARI AND LAKE KOPIAGO REGIONS

This list provides details of most of the known $^{14}$C determinations from the Taro and Lake Kopiago regions. The results from my own field research are all the ANU dates beginning with ANU-7623, except for ANU-8270 to ANU-8272; sources for all other results, which have been calibrated for this list, are given in the list. Calibrated dates (cal BP) are provided, using the CALIB rev.3.0.3 program, with none of the special options applied (Stuiver and Reimer 1993a, 1993b); a note on this procedure is attached below the results.

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<th>Lab. code</th>
<th>Sample code</th>
<th>$^{14}$C age BP</th>
<th>Cal age BP (2 S.D.)</th>
<th>% Pr</th>
<th>Material</th>
<th>Location and source</th>
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<td>2826 TE/5</td>
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* AMS date
* m Modern result (1955 or later)
* %Pr. Relative contribution to probability at two standard deviations.
Notes on radiocarbon dating and calibration

All samples with radiocarbon ages younger than 18,360 BP have been calibrated using the CALIB rev.3.0.3 program (Stuiver and Reimer 1993a, 1993b). Calibrated ages are given BP, with age ranges at two standard deviations obtained using the probability distribution method (Method B) of the CALIB program. For each sample, the median intercept calibrated age is given in bracketed boldface. Following the procedure suggested by Stuiver and Reimer (1993a:12), calibrated ages have been rounded to the nearest ten years (all of the samples listed having standard deviations greater than 50 years); ages that end in a 5 have been rounded "up" to 10. An age of 695 cal BP is thus given as 700 cal BP. No correction factor for Southern Hemisphere atmospheric samples has been applied (Stuiver and Reimer 1993a:20; Option K).
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NARRATIVE B1 - Ni and Hana (The Sun and the Moon)

Bari-Wayama (Yumu), 13.9.89, 89/1A:49-119

Agali mbira iba Tagali o piyago ni iba unu pumaro bidagoria iba dadabu balu hene.
There was a man at the Tagali river, draining the water down to its base.
Iba dadabu balu hearia tia irini mbira yalu ibiyaria hendene.
As he drained the water, he saw possum fur floating on it.
Obagoni ibu mo nene mo nalu berearia dendebyagola hendene.
He took this and ate it and found it tasty.
Dendebyagola hordowa udu iba rigidia handama iraga halu berearia udu ibatigida yalu ibuabo hayagola monama nama ibuabo hene.
It was tasty, so he followed the river upstream and found more fur, which he took and ate as he went.
Nama iba rigidia ibuabo halu berearia udu Tagali nai ore Hewai pugu layago howa udu handa daga halu berearia udu mane nayalu ibi.
Taking and eating thus, he came up the Tagali to Hewai falls, and looking up from beneath the falls, he saw that there was no fur coming down them.
Nayalu ibiyaria hendene agua be toba howa hearia irini mbira udu ira maneni paga hearia hendene.
He was confused [toba ha] - where was this fur coming from? He looked up and saw some fur hanging in the crown of a tree.
Ira yunini. O ibu narugoni udugo howa ibira hendeda lowa li paguwa pare baowa iraga hene.
On the tree leaves. He thought that the stuff he had been eating was up there, so he climbed up.
Monama iraga halu berearia wali mbira li berearia iraga hene.
When he took it and ate it and climbed up, he saw a woman sitting there and went inside.
Wali mbira li berearia iraga howa.
He went into where she was sitting.
O tia irini biago li wali beragoria dugu paya blaria hendene waligo ibu ira nadele bane egelandaha.
Where the woman was sitting inside the cave he saw much fur, and he saw that she was sitting on top of the possum, but that there was no fire.
Wali biru paiaga berearia.
She sat and slept without a fire.
Tia irini dugu paya biago i naru ale ogoda lowa monene ogoni naya ale nagago.
When he saw the fur, he said 'That is what I was eating,' so he took it and ate some.
Tia dawa ngogo naiowa tia dawa wini bago mo pe hene.
She said 'I have cooked some possum, take it and eat it' and she gave it to him.
Dawene bago mo pe hayagola howa, handalu berearia ege hiriti uli nawi. Dawene uli nawi.
When she gave him this cooked food, he saw that there were no cooking stones.
Ira nadeleyagola tia hangu dawa wiagola hordowa.
She had not made a fire, yet she had cooked the possum.
O ndo ibu mbira waiguma dawaliya ngi lene. Bo wi yagwa.
'No, if you kill a fresh one give it to me and I'll do lookwise [i.e. cook it, from bo wia - to copy].'
O ibu dawaro howa o bo wiyago iri heba bowinyaayo miyagola howa. [...] I'll cook it' he said, and she gave him an unskinned possum.
Ege hirule ira hibu nowa. Ege hiruwa uli godowa ibu dawene.
He made a fire with wood, heated stones, dug a hole and made a mumu.
Ibu dawayagola ai wali i nde ebere dawareda dagua ibu hondolyia dawa lene agali biago ibu dawaho biruwa. [...] When he had cooked, he sat and said to the woman, 'Now let me see how you cook'.
Wali bago dawa layagola wali biago ibugua howa.
He told her to cook and she did.
Yu tugua angi bia.
She took ferns and cut banana leaves.
*Ma hai uruni buwa angi tebera howa bame li daliga bagoria bira dambi hene.*
At the base she put tåro, banana, then on top the meat and banana leaves and then she sat on top.
*Bira dambi hayagola pobo hagua urume tilti lowa.*
When she sat thus, her heart [pobo] and steam [hagua] burst forth with a noise.
*Tomo dawayagola darali dagua pobo hagua tambugu bini.*
It was like when water is poured over cooked food and heat and steam rises.
*Dowa heagola wali biago ibu pogo la amu hayagola ma biaru do dagabu wiaria.*
When it was all cooked, she came off it and everything was cooked and deboned.
*Tia biaru kuni do piagolo wiaria duguni.*
The possum was cooked through and the bones were all stripped [of meat].
*Ai dawarayago o dawaraganida lene.*
'Ai, this is how you cook', he said.
*Ai mbiraga paliaba lowa anda ibuwa.*
'Ai, it's night, let's sleep', they said and they went inside.
*Agali biago ibu ira delowa eganda ira delowa paliyagola wali biago ibu tambeneha palene.*
He made a fire in the cave and slept by it, but she didn't make a fire and slept in a cold area.
*Ibu andaga paliyaga dagoria, anda andobe uru do wiaria hendene.*
Where she slept, the house was thoroughly blackened [as if from fire, in reference to her "heat"].
*Aguani buwa ibu tambeneha palipe hene.*
Thus it was done, and he slept.
*Mbiraga paliyago paluwa wali biago ibu mbiraga agali biago palia hondo heaha.*
When they slept at night, while the man slept,
*wali biago ibu tia bo piyia. Tia bo puwa.*
the woman went out to hunt possum.
*Ogoria bo payabu wiaria hendene agali biagome.*
She carried the possum back and the man saw that she had brought many.
*Ai egerabagi tia dawabiya ogoni be.*
'Ai, I'll cook it in the morning', [he] said.
*Au lowa ai ibu nde talebu miya.*
When this was said, she divided them and gave some to him.
*Ibu nde ibu dawaga, bia dagua dawale.*
She would cook as she did.
*Agali biago ibu talebu ngi lene.*
The man said, 'Give me my share'.
*Ibu talebu miyagola ibu tia mbiria biago mo do hene.*
Of his share, he took one possum and hid it.
*Mo do howa. Ai ibu tia dawale ira bo porogo lowa, ayu yalu puwa.*
When he had hidden it, he said, I'm going to cook my possum, so I'll go and get some wood', took his axe and went.
*Tia biago o howa mo yalu yalu puwa.*
He took this possum and carried it with him.
*O ira mbaria amu Tagali ore pugulu pe hayagohe.*
A tree stood leaning over the Tagali river.
*O ira ore podalu unu ibani agua podape holobada lowa manda buwa.*
He saw this tree and thought, 'If this tree breaks she will fall into the water'.
*O ira biago ayume dibu gua bini.*
He cut this tree with his axe.
*Dibu gua buwa tia biago [...], ira hengebunehu gedo talu, ibuwa ayume, ira biago dibu gua bini.*
When he cut it... [first] he placed the possum in a forked branch, then came down and cut the base of the tree.
*Aguani bialu ibu dai bini.*
This done, he returned.
*Dai buwa wali o inaga tia mbaria amu beda handala eberago.*
When he came back, he said, 'Woman, I saw a possum sitting over there so I came back.'

_Ina bo ngule mba lene_.

'Come and kill it to give to me'.

_Mba layagola howa o libu haru pene, ibugua bole berogo mba lowa libu haru pene._

'Come,' he said, so the two went for her to kill and give it to him.

_Puwa [...] tia biago amu bedagoni lalu walia hene._

They came to where the possum sat and he showed her.

_Wali biago ibugua ira biagoria gerai irini._

The woman climbed the tree.

_Iruwa tia biago miniyu hea ore unu iba biagoha._

She climbed up, grabbed the possum, and when she did this,

_o ira biago heba wali biago heba podo pe hene._

when she held it [the possum], the tree broke while she was in it.

_Podo pe hayagola, Tagalini, hagua hungume iba biago do gabu ki bini._

When she fell into the Tagali, steam rose together with fire.

_Wali biago pobone ne._

This was the woman's heat.

_Do gabu ki biyagola agali biago ibu handaya ho hene delo._

The man watched this steam from above.

_Handaya heagola howa tambe ore hayagola howa._

He watched for some time till she had cooled down.

_Tambe hayagola howa o dalini._

When she was cold, he went down.

_Daluwa wali biago dugu gilili mini._

When he came to the water's edge, he dragged her out of the river.

_Au yalu yu hari biagoha iraga hene hari bare biagoria irini._

He put her on his back and carried her up the hill.

_Ani buwa yu egeanda biagoria anda pene._

He carried her up to the cave and went inside.

_Anda puwa ede iragoria redeitedo wu amu howa nge lene ira delene._

When he came into the cave, he put her by the fire.

_Ira nende bu nende bu nende bu gabu delene._

He stoked the fire up.

_Wali biago ede biagoria beregede hinaga, beregede hinaga, beregede hinaga bu ngelowa._

She turned round in her sleep next to the fire.

_O ede birayago bi hongo howa hiyu bere lene ira biagome._

The fire dried her and she got up and sat.

_Hiyu birayagola howa ai wali o i nde tia dawa lene ibunde dawarlo ai._

When she got up, he said, 'Woman, cook your possum and I'll cook mine.'

_Ai gibu gle mbira biyago bi layago._

'Are you afraid to do what you did before?'

_Dawa lowa o wali biago ibu nde amu dawarlo dahau dawene, agali biago ibu nde ege hiruwa dawarlo dahau dawene._

He said to cook, and she cooked in her way and he in his.

_Au biyagola howa wali biagome dawayago._

She cooked as she was accustomed to.

_Kange wiaria hendene._

But she saw that it wasn't cooked.

_Agali biagome dawayago nai do wiaria hendene._

The food cooked the way the man cooked it was cooked.

_O agali biagome dawayago libu haru duguwalu naribi._

The two went and dug up the man's mumu and ate it.

_Ai wali biagome dawayago kange hene._

The food cooked the way the woman cooked it was uncooked.

_Agian biyagola libu obagoriani hene._

So the two lived together.

_Libu obagoriani howa, o agali biagome wali biagoni o ibu one howa o libu waneigini._
honowini.
They lived together, married and bore children.
Honowiyagola howa, o igiri mbira honowini.
When they bore, the first was a boy.
Igiri honowu howa ndone/lone wandari mende honowini.
When this son was born, the second was a girl.
Aguani buwa ai wandari biago ibugua egerabagi mbiraga tagira puwa.
The girl would go out in the morning before dawn.
O alendo anda ibuṣu biyagola howa o poragani agoha porabe handama pu lene.
She would not return till late in the afternoon, so he said [to his son], 'Follow her and see [what she does].'
Handama pu layagola o wali angibuni agali taribuni biago labo tibugua igiri ogoni ina wandari ogoni goriama pu lene.
The parents agreed and told their son to follow his sister and find out [goriama] what she did.
Goriama piyagola ii Yumu Nene ngaragua bolangua howa, amu Dagia amu domade howa.
He followed her to find out, up there to Yumu Nene, and then across [domade] the Dagia river over there.
Ede Bebenite gebeanda anda pu hearia hendene.
Over there to Bebenite gebeanda where he saw her.
Aguani puwa ede hearia hondowa, o libu haru ede biagoniha howa.
He found her where she sat and the two had intercourse.
Wali biagoni ibini hene. Igiri biago ibu one hene.
Brother and sister slept together.
Ibu one howa ai aga lole dai biba.
When they had slept together, they said, 'Ai, what shall we say when we return?'
Dai bialu kabaria ai taga biaruago.
'When we go back we shall be shamed [taga].'
Au lowa, o li iraga howa Hari Ambua wene. Hari Domada wene.
Hari Geloba wene.
They said thus, so they placed the mountains Ambua, Doma and Gereba.
Iba Piwa duguni. Iba Alua duguni. Iba Doma duguni.
They dug [the channels of] the Piwa, Alua and Doma rivers.
Here libi iba wini. Digi here iba wini.
They placed the sal: sources [here libi iba] and the red ochre sources [digi here iba].
Ani bialu ibu dai bini.
This done, they returned.
Ibu dai bialu, ainya abala berearai nai iraga hene agi biribibi laya.
When they returned, their parents asked, 'What have you been doing?'
Hari wedeba lene, iba dugudeba lene, here libi iba ngaba lene.
'Placing these mountains, digging these rivers, placing these salt sources,' [they replied].
Ai agua berebibe lene, ndo Duna poroba lene. O Duna pene.
'Now what will you do?' 'Oh, we'll go to Duna.' So they went to Duna.
Duna puwa amu pu howa [o amu pu amu hayagola Here Libi, iba wini, ai], iba Gora Awq bere lene.
When they came over there to Duna they [...] sat together at the Strickland river.
Ega Gabiago bere lene. Dombobuli irane helene.
They placed Lake Kopiago. They planted the dombobuli [Nassa shell] tree [popular Huli belief has it that Nassa shells grow on a tree].
Duna hari nai wiaru wene. Ani bialu ibu dai bini.
They placed all of the Duna mountains and then returned.
Ai agi bialu haribibi laya, Duna hari wedeba, ega Gabiago bere ledeba.
'What have you done?' 'Placed the Duna mountains and Lake Kopiago.'
Ani lene. O Gora Awq bere ledeba lene.
It was said thus. That they placed the Strickland river.
Duna hari wedeba lene, here libi iba ngaba lene.
That they placed the Duna mountains and the salt sources.
Ani lalu dai bialu berearia duria nai bagoria hono payabu wiaria iraga hene.
When the two came back, their parents had borne five children.

O hono payabu ngemiruni mini aibe lene igiri biago ibugua.

'What are the names of all these children?' said the boy.


'That one is Heyolabe, that on is Parindali, that on is Giraboli, that on is Yuguale and that on is Dabuale,' they replied.

Ai bayale honowini dago libu ai kababe lene.

'You have borne well, but what are our two names?'

I Hona Ni lene. Igirigo i.

'You, the boy, are Hona Ni [the sun].'

Wandarigo aibe lene. Hona Hana Wali lene.

'Who is the girl?' 'She is Hona Hana Wali [the moon].'

O libu agoria hole porobabe lene.

'Where shall we go?' the two said.

Libu li hari ogoria hole pudaba lene. Lo maro biruguni.

The two were told to go up into the sky. That is all.
An interview version of Narrative B1:

There was a woman living at Maberl [near Hewai falls]. A man standing on the banks of the Tagali river saw possum fur on the water and walked upstream eating it to find the source. Before he got to Hewai falls, he found fur falling from a tree. Then he found a woman plucking a possum. The man was still eating the fur and the woman said, 'The fur isn't meant to be eaten, the edible bits are in the mumu.' But he couldn't see a mumu and didn't want meat, so the woman gave him fur first, and then meat. The man made a fire with cane, heated stones and mumued the meat. 'Show me how you mumu,' he said to the woman. She made a pit, covered the possum with earth and banana leaves and sat down on top of the mumu. Smoke soon emerged from where she was sitting and then she dug up the mumu and the possum was cooked and de-boned - with the bones laid to one side. The woman went into a cave (the man could see smoke but no fire). The man slept in a separate part of the cave, made his own fire and while he was asleep, the woman went hunting possum and brought plenty back to the cave. The man said, 'I'll get firewood,' and stole one of her possums and went down to the Tagali where he found a tree on the bank with a fork in it in which he placed the possum. He then cut the tree at the base so that it was almost felled. The man went back to the woman and said he'd seen a possum in the bush and that she should come and get it. The woman climbed up the tree which broke and she fell into the Tagali. Steam and smoke rose up from the river. The man pulled her from the river, half-dead, and put her legs around his neck and carried her back to the cave. He brought dry firewood, made a fire and put the woman close to it. She dried out and recovered, asking, 'What happened?' The man told her she had fallen into the river and asked her to cook some possum. She murmured as before, but when she took the ground out, she found the possum uncooked - she had lost her power of heat. The man and the woman slept together and they bore a boy and a girl who grew very quickly. The girl walked along the ridgeline of Mt Yumu. The parents told the boy to find his sister. The girl crossed the Dagia river and the boy returned. On the next day the girl walked to Bebenite and the boy returned. The boy then went back to Bebenite, had sex with his sister and the two returned to their parents but said nothing. The following morning, the two left for Bebenite and went up to Iba Alua etc and finally up to Ambua, where they put the ochre and salt sources in place, so they could tell their parents they had been doing something (while having sex instead). Next day, they left home for Duna, where they put the salt and ochre sources and lakes in place. On their return, they found five other children: dama Heyolabe, dama Parindali, dama Wali, dama Wali Polome and dama Yuguale and Dabuale. The boy asked his parents what his name was, and was told Hona Ni. He asked what his sister's name was and was told: Hona Hana Wali. 'Where are we to go?' The parents replied, 'To the sky', so Ni became the sun and Hana became the moon. If the man hadn't made the woman fall in the water, women would eat men and destroy them entirely. This is why we kill pigs for the sun and the moon.
NARRATIVE B2 - The Cut Vagina

Ngoari-Mandiga (Tani), 1.8.91, 91/14A:381-465, excerpt

Wali hamba ho hearia daga nabi haabo hayagola,
A woman had a vagina but it had no opening;
agua to ho wiabo hayagola, agua durubu tono biyagola,
it was swollen up so she used to scratch it.
Are yogona edebagoria bo, edebagoria kambu lowa,
A man found some stone flakes [are yogona],
ira kambu lowa, are yogona agua bo wini, are yogona bo wiagago ka. Agali. [..]
and he set them in the tree where she scratched herself.
Are yogona agua bo wini, bo wiaria, wali hamba agua to howa,
When he had set the flakes, the woman with the vagina,
hamba to howa, o tola nale wiabo hayagola,
the swollen vagina without an opening;
tola nale wiabo hayagola, are bowa, are Luya Talela,
this swollen vagina without an opening, the flakes broke it, the flakes called Luya and Tale,
tale [=hale] timbu ede heagoria are yogona agua kala pe ho wini.
which were placed in a big hale [Elmerillia sp.] tree.
Agua kala pe ho wiari o ede duru bu toro biraligoria.
He broke these flakes and put them where she scratched herself.
Agua duru biarua, pobu biyagola.
When she scratched herself, she became hot [excited sexually].
Duru biyagola ede daqabu pe hayua, daqabu pe hayagola.
She felt thus, so she scratched more and broke.
O ibiame nene e ibiame nalu o ibia ibu unu ibaha ibira hene.
When she was broken, the centre part fell into the water and became an eel.
Guru ibiame nene guru ibiame nalu o ibia ibu unu ibaha ibira hene, wali pugua / buga ibira hayago.
The eel [guru ibia] came up from the menstrual blood [pugua] dripping from the cut,
Guru ibia ibu ega kamia hanga haga...
The eel is for the performance of the ega kamia hanga haga rite [in which dams are
constructed to trap eels]...
O ede dindi baholo bu ede ngagoni Bebenite edegoriani o ani biagane wini.
These flakes were set over there at Bebenite.
O wali dago ibu ogoriani biruwa nira honowia hayagoni,
The woman [Tia Nangumel] sitting down there bore all of these things:
* o gambe, o yagua, o dangi, o ibu ibu pela.

the grasses *gambe* (*Miscanthus floridulus*), *yagua* (*Pteridium aquilinum*) and *dangi*
(*Imperata cylindrica*) and then water which came out.

_E hari hari ogoriani dage howa, o hari wene._
She placed the sky and the mountains.

_Ani buwa o hari ibini, irabu hari, ogobi ibugua dage wene._
First she placed the sky, then the forests and mountains.

_Ogoriani biruwa, o dagani damene ogoni ibugua biai halu ngelame halu bialu._
Sitting over there she completed these things.

_O wali dago ibu, o hariga ibu puabo henego._
This woman came here along the track.

_O hariga puabo hau, o nai amuna Goloba amuna mbira palene,_
She went along the track and slept once over there at Koroba,

_udu Kiaburege mende palene, o pialu amu o Hewari Gambeni anda pene..._
then a second time at Kiaburege and then she went over there to Hewari Gambeni...

_Hewari Gambeni howa, o Geloite amu nga. Dindi Gelote._
She came to Hewari Gambeni, from Gelote over there. The place Gelote.

_Duna o ogoriani anda penego, ani binigo Hewari Gambeni howa._
She went to Duna, to Hewari Gambeni.

_O ogoriani biruwa, o, o ogoriani biruwa Hela hononwini._
Seated there, she bcre Hela.

_Agali Hela. Hela ogoriani honowua._
The man Hela. Hela was born there.

_O ogoriani howa ti Hela ibugua, Hela ibugua o Hela Huli mbira hononwini._
The first born to Hela was Hela Huli.

_O ndo, Hela Duna wahene hononwini. Hela Duna._
No, the eldest was Hela Duna.

_Ani buwa ngelowa, o Hela Duguba hononwini._
When he had been born, Hela Duguba was born.

_Ani buwa ngelowa, Hela Obena hononwini._
When he had been born, Hela Obena was born.

_E ani buwa, o Hela Hewa hononwini._
Then Hela Hewa was born.

_Ani buwa wali Gogonabe hononwini._
Then the woman Gogonabe was born.

_Ani buwa o Hela Huli heyogone hononwini. Hela Huli._
Then Hela Huli was born last.

_Aguani binigo, aguani binigo, o ibugua ogoriani howa, o ti anda bialu hene._
There they made a house and sat.

_Guabala anda, anda daiga [= daliga], anda bialu hene._
A long house, going up, they built.

_Ani biyagola, o anda bago bialu ai pu mo ngi._
When they were building the house, they called out, 'Bring some rope.'

_Ai anda ogo bima, au layagola howa o ndo Hewa ibu, o nina hama ibago._
They said, 'Let us build a house,' but Hewa stood about doing nothing.

_Nira ibu mangaha. Au bialu hearia obiago, o kangome minu bene._
He was lazy down there. When he did thus, they beat him with a stick.

_Tibume, ani bu mini bya handale, ndo._
When he had been beaten, he said, 'No';

_o ibu Wana bu hinaiu, poro lalu, ibu o ibu mbalini Gogonabe dagola,_
when Wana [Hewa] had been beaten, he said, 'I am going off with my sister Gogonabe,'

_libu libu pu tara herego unu unu palu mahu bidagoni. Au lene._
and these two went off and slept over there.
O unura pali mabu bidalene.
Over there, down below [in the lowlands around Lake Kutubu].
Ani lene, ai ani bialu, ai Duna ibu.
When they had gone, Duna, 
O ogorani biruwa anda bago bialu howa, ibu o Dunabi layagola howa, o ibu Duna. Au lene, o ibu Mirila.
Duna took Duna speech and they said, 'You are Duna, you are Mirila'.
Au lene hago dulu paya, bindi baro, ega malungu,
It was said thus, fur of the dulu paya possum, rope [bindi baro], feathers worn in the hair [ega malungu],
dambale auataba uru, mbagua yole uru momialu. Ibu Duna ogoni.
string apron [dambale auataba] and mineral oil [mbagua yole] were given to Duna.
Ai Duguba, ibu Duguba bi bi lene,
Duguba took Duguba speech
obagoria biruwa ai ani biyagola ndo i Dugu Yawini da,
and sat over there and they said, 'You are Dugu Yawini,'
Mi Gilini da, wai hegene, tabage luni uru abiyane, ai gewa hagone au lalu.
'You are Mi Gilini, with feathers [wai hegane] of the abu hege bird, the long drum [tabage luni], the cane belt [gewa hagone],' it was said.
I Dugu Labane au lalu ibu ibu pene.
'You are Dugu Labane,' it was said, and he went off.
E Hela Obena ibu ogoni biruwa, Hela Obena bi bi laya.
Hela Obena was seated there, with Obena speech.
O Hela Obena i, o hagi dambale uru, iba donge uru,
'Hela Obena, with the long sporran [hagi dambale], the wide bark belt [iba donge],
pagabua mane uru, gulu wambia uru, ai ayu,
the pigs tails [pagabua mane], the bird of paradise feathers [gulu wambia], axes [ayu],
o Hela Obena manda wagowago uru, i nde i pu lene.
and your wig style, go now,'
E aguani bini, Hela Huli ibu, o obagoriani howa....
This done, Hela Huli stayed here....
Au bini o Hela Huli ibu, o ani binigo howa, o Huli ibu, ina ina kamagoni.
Hela Huli is us, we people here.
NARRATIVE B4 - *Hela pureromo (Hela Adage)*

Maiya-Alua (Munima), 27.9.89, 89/3A:349-384

*Hela Obena ibugua gulu wambia uru.*


with their hair nets, the axes that come from there

*Here libi uru, hirulene ibi iba uru wi.*

Their salt, the salt that they get from the water sources.

*Ogoni pene, ai timbu uru payabu uru.*

They wear cordyline,

*Manda wagowago uru, lai yandare yula. Hela Obena pene.*

round wigs, carry spears of lai [Dodonaea viscosa] wood.

*Ani lene, i hame handa lea dagu lalu howa.*

This was said, this is how my father said it.

*Mirila ibugua penego, pombo puli tolene,*

The Duna, with headbands

*pindi baro bulene, anda tawa anda bulene,*

with bamboo pinned across their foreheads, living in pandanus houses

*ega malungu bulene, dada tegabe uru honolene.*

cassowary(?) plumes in their hair, laces of red seed across their chests

*Duna bi lole pene lene.*

They speak the Duna language

*I hame ibugua lea dagu lalu howa.*

This is how my father said it.

*Hela Obena ibugua anit bini lene.*

Hela Obena say thus too.

*Dugu Yawini penego unuguha pu ka lene.*

Douguba, they say, went down below.

*Ibugua nde nulua hiva dibulene, nangama dibulene,*

They cut sago trees, they cut nangama [unidentified woody species] bow staves,

*hoga yolu hambulene, aminami [aminemo?] hambulene.*

fill up with tree oil,

*At, dange uru dolene, unuguha pu ka lene.*

carry shells; those who got these things went to live down there.

*O Dugu Yawini lene. Hela Huli ina ogoria kogo lene.*

Douguba said thus. Hela Huli said, 'We will stay here.

*Ina nde manda hare uru holene,*

We wear the red wig,

*danda timu uru yulene.*

hold the bow and arrow.

*Gulu beberaya payabu uru bulene.*

Wear the gulu beberaya cordyline.

*Nu emene uru honolene, dambale pongone uru bi,*

 Carry the small net bag, wear the woven sporran

*manda hare uru holene.*

and the red wig.'

*Ina nde dombeni ogoria haro lene.*

We said, 'We will stay here in the centre.'
NARRATIVE B5 - Digiwa of Digima Clan and the Origins of Sweet Potato

Digi-Malingi (Digima), 13.6.91, 91/9A:382-end, excerpt

Digiwa ibini hangu edebagoria hearia.
Digiwa [the man] was the only one here.
Ai ore, gana godo mabu mabu mabu bu ngelo biraya.
Once he dug a ditch around his garden and sat there.
Unuguria godo ngela, amuguria godo ngela, naiguria godo ngela buwa, biraya.
He dug it down there, over there, over there, and set it out thus.
Berearia libagoria mbira godo wiyagoria,
Seated there, he dug one garden.
o digi hina muguba hina doai lene,
and the digi or muguba variety of sweet potato (hina) came up there,
mende o bamu paboro mbaguali uru doai lene.
in the other, bean and gourd came up poorly.
Ogonti doai lai hene.
These came up there.
Doai lai hayagola, digi hina biago yu lo gimbu gimbu gimbu biyagola.
When these things came up, digi hina spread all over the place.
Nandi paboro mbaguali pini miai haya.
The yam, bean and gourd were trailed up sticks.
Pini miai hayaria, hina biago pini miyaria,
When sticks were made for these, they were made for the sweet potato too.
nde girigere layagola, a ai hina biago ko, yolahe.
But when they did thus, the sweet potato grew poorly; it just hung there and he could see that it was poor.
Ko haya handala, dindi dugu dambi haya.
Because it grew poorly, he covered it with soil instead.
Dindi dugu dambi hayagola, ba timbuni, digi hina, digi hina lenego.
When it was covered with soil, it grew large and it was said that this was [really] digi hina.
O hina yulame ho ayu kagoni.
This sweet potato which grew then is [still] here now.
NARRATIVE B6 - *Hina tene te* (The Origins of Sweet Potato)

Maiya-Alua (Munima), 5.1.91, Tape 90/2A:90-154

_Hina digi hina. Hina alu muguba. Ma hubi gaea._
Sweet potato is [given the praise terms] _digi hina or alu muguba_. Taro is [given the praise term] _hubi gaea_.

_Ma yarali ho nelaro. Bamba nandi. Bamba ira goba._
I'll leave taro till later. Before there was yam and there was rotten wood.

_Bamba homa bavilia. Bamba nano ogoni no haraya._
Before there was pueraria. Before there was the _nano_ mushroom.

_O, Heyolabe ibugua. Heyolabe ibugua honowini dama ti ogoni nalu haga._
These things that Heyolabé bore, the _dama_ ate these things.

_Au biagola howa, dama ibugua howa wali damu purogalaga bini._
The _dama_ went and found a woman and brought her back.

_Wali damu purogalaga bini dagua,_
When the _dama_ got this woman,

_o wali damu purogalaga wali hono wiya dagua,_
she bore him children;

_waliha howa Digima andaaga digimu amuraha nga, Dunaha,_
she bore them at the place Digima, on the Duna side [of the Tagali river].

_Ogoniha howa. Digi hina ibini._
The _digi_ sweet potato cultivar came from over there.

_Digi hina Habono-Bebo ainya, o, wali Buria handa yalu ibini._
_Digi hina_ was brought by Habono-Bebo's mother, the woman Buria brought it.

_Habono-Bebo ainya handa. [...] Digima anda howa._
Habono-Bebo's mother brought it from the Digima area.

_O hina Habono-Bebo ainya handa yalu ibini._
Habono-Bebo's mother brought sweet potato.

_Habono-Bebo, Habono-Pubali, Habono-Liruaya uru hene._
Habono-Bebo, Habono-Pubali and Habono-Liruaya [her sons] were there.

_Iba Tagali na ibu peâ ha._
The Tagali river wasn't there then.

_Ogoni wali mbira hora hayagola,_
Once, they had buried a woman

_wali ogoni duguanda berearia._
and they were sitting in her mourning hut.

_Bambolini mbaria dea dagua, mbaguali uru dea dagua, yuni o baragua doai lowa anda hene._
Vines like those of the cucumber and bottle gourd came up.

_Doai lowa anda hayagola howa, o, wali biagome ira kanogo wa howa pini mini._
When they came up, the woman planted a stick and trailed the vines up the stick.

_Pini mtyagola howa obagoria bamboli dara dagua mbaguali dara dagua lini do girigere lene._
When they trailed up the stick, they looked like cucumber and bottle gourd, but they bore nothing.

_Ani biagola unu pinigo ha dindi godo homa bini wali biagome._
Then she put some ground over the roots.

_Habono-Bebo ainyc handa._
Habono-Bebo's mother.

_Dindi godo homa biagola Pebo Pubali Liruaya ima ainya, Miniba wali, Buria-Abuna handa._
She placed the soil thus, this woman, mother to Pebo, Pubali and Liruaya, a Miniba woman, Buria-Abuna.

_Godo homa biagola howa o lini deagola howa._
When she placed the soil thus, the fruit [lini] came up.

_Ai lini ore do ti tau layagola howa,_
When it fruited and it was almost ripe,
o nde abidabe hondole lowa, wali mbira [...],
when this was done, this woman,
o lini biago dowa hiri nene.
she tasted one of the fruit.
Hiri nayagola howa, o, ai dendebi ngabi.
When she tasted it, she said 'Ah, it is tasty,'
O, unu dinidi ha peago nde kango yuwa wene.
The others, deeper down, she also dug up with her stick.
Wayagola [... o pini beago pu amu hearia dendebi ngabi dage.
These ones from deeper down were tasty too.
Ani lowa, obaganime egane yu lowa horo yu ibaga buwa hangalu.
She carried these around and planted them.
O hina nanaga henego hina pigane ogoni angi nene dagoni.
Before they didn't eat sweet potato, this was the first time.
Nowa iba Tagali ni biago na ibu pea hago.
When they first ate it, the Tagali river didn't flow where it now does...
Ani binigo hina tene Miniba Habono-Pebo ainya handa
The source of swee: potato is Miniba Habono-Pebo's mother;
mwo wini Digimu andaga Digimu howa mo hono ibini.
it was brought by her after it was given to her by Digimu at the place Digima.
O hinanaga tene ogoni.
This is the source of sweet potato.
O Digimu andaga howa ibini dago lowa, dugi hina, ani laga.
Because it came from Digimu andaga, it is called Digi hina.
Muguba, alu muguba ani laga.
It is also called muguba or alu muguba [praise terms].
Ani laga hina mini mogia uru... heme uru,
There is a sweet potato cultivar called mogia... and another heme,
gabutuguya uru, gawa uru, daberu uru, aliga uru,
also the gabutuguya, gawa, daberu and aliga cultivars,
tianobi uru, tugulu uru, hina ani haga mandiyame uru,
the tianobi, tugulu and mandiyame cultivars,
mole uru, kuli uru, haga, giambu hina uru, aroguai uru,
the mole, kuli, giambu and aroguai cultivars,
tebolopaia uru, haga, hina mini, ani bialu, bitiraya uru, bagaya hina uru...
the tebolopaia, bitiraya, and bagaya cultivars...
Ani buwa a bialu hemagola ayu howa,
These were here before the present time,
o ayu ore howa, o ayu ore o paluni nala hemagola howa honebi tagira ibiyagola howa,
those [cultivars] that have come only recently... these others [from before] were buried
[literally "grave goods for" (paluni), i.e. abandoned] with the old men when they died,
when the whites came,
o magaya hina uru, tagira ibiya, ani buwa obago nala hemagola howa,
then magaya hina came out.
o bo hina, dambera hina uru, tagira ibiya,
the bo and dambera cultivars came out,
dambera hina o lira o Malibu ha howa, o Malibu.
dambera came from Malibu.
Bo dindi mugua howa, bo hina ogoni ha tagira ibini.
Bo came from the place Mugua, bo came out from there.
O gaea mbaria timbuni binigome.
A great drought happened.
O wali agali hina garime homa pu kema ha.
Everyone went hungry and many died.
Gaea dago buwa tagira ibiyagola bo hina ogo tagira ibini.
It was when this drought happened that bo hina came out.
Bo hinago tagira ibuwa habia hina, dama hina, tagira ibini...
After bo came out, habia and dama came out...
Gondoma hina tagira ibini. Ani buwa po hina tagira ibini.
Gonda na hina came out, then po hina.
Ogoni honebi tagira ibiya angi, tagira ibinigo ogoni.
When the whites came, these came out.
Ala tagira ibini, o hina unu laruguni, o hina digi hina, hina alu muguba, ani laga biaga.
The first [ala] to "come out" of the cultivars we have talked about was digi hina, alu muguba hina.
Dus hiwa tege, ani laga biaga.
Sugarcane we call hiwa tege [praise term].
Hai habo waya ani laga biaga.
Banana we call habo waya [praise term].
Ma hubi gaea ani laga biaga. Ogoni.
Taro we call hubi gaea [praise term].
Ina hame mahu win: ogoni honebi naibia angi.
Before the whites came, our fathers laid down this mahu [literally "genealogy"].
NARRATIVE B7 - Nogo tene te (The Origins of Pigs)

Abu-Ganabi (Wenani), 9.11.90, 90/1A:73-89

The black pigs came from Wara-Yuguale and Wara-Dabuaale, from Nogoli Paiaba and Giginawini Gula, from Giginawini Mbirili [all clans and places in "Duguba", the Papuan plateau to the south of the Huli].
_O nogo mindi niguha howa tagira ibini. O ni Duguba anda howa._
The black pigs came from down there. From down there in Duguba.
_Ai li Duna, Au Boda nogo, Higida nogo, Hagani nogo, Yagura nogo, o nogo tambugua ibini._

From up there in Duna, from Au Boda, Higida, Hagani and Yagura [these clans], there came the brown-skinned pigs.
_Ai nogo hone, o li Cerene Gauba nogo, Undu Liya nogo, Wagala Waiba nogo, Bagaya Dabiranalo nogo, o li ArUanda howa tagira ibini._
The red-skinned pigs came from up over there, from Gerene Gauba, Undu Liya, Wagali Waiba, Bagaya Dabiranalo [these clans], from the direction of Arua.
_Nogo pagabua o li Hela Obena nogo, dambale lu nogo._
The mottled white pigs are from Obena [Enga/IPili], the pigs of the men with the long sporrans,
_manda wagowago nogo, o ligo howa tagira ibini, o Hela Obenanaga._

the pigs of the men with wigs, the Hela Obena, they came from up there.
_An i bialu nogo ogonime yulene ngama._

These pigs we brought from these places to here.
_Yu lalu ogonime hirini, o agali ayu yu heangi, dandayu heangi._

When these pigs were brought here, men were already here, holding bows,
_wali biraya angi, gana waya angi, ai anda biya angi, nogo hina angi._

women were here, citches were dug at this time, houses were made at this time, pigs were given fodder [i.e. reared] at this time.
_Nogo hinini dagoni ogoni angi, agali gana walu, agali danda yalu._

We looked after pigs at this time, when men dug ditches and carried bows,
_wali huru bialu, nu hanalu._

[when] women made skirts and carried pigs,
_ai au laya angi tagira ibini._

at this time they [the pig breeds] came out.
_O nogo ogoni angi tagira ibini dagani, hinu yu lene ngama._

When the pigs came out, we tended them and we spread out [yu lene].
_Hinu yu lalu, o daga tege bima daru, wali dabu bima daru._

When we spread out, we performed the _tege_ ritual, paid brideprice for women, _nogo barama daru, bi iarama daru, nogo ni hana howa._

and killed pigs; pigs are the base of our talk.
_O agali ogoni bialu hema angi tagira ibini, nogo._

When men did these things, it was because of pigs.
_An i binigo o ayu hiriyu lenego ayu kamagani._

Now we have tended them and spread out and are as we are.
Hari uyugu kilikulu larua.
Up there in the skies there was great thunder and lightning.
Kilikulu, tigittugu, laatu kagola anda, dindi hombene wiyaugoria biama piarua.
When it thundered, they used to build houses on high ground [hombene].
Dindi hombene biaugoria. Hombene biayagoria biama piyagola howa, o nga aleni hombeneni anda bina piaruagni.
On the high ground, at places like this [gestures around us] they built their houses.
*Au biyagola tigittugu laatu.*
They did thus as it thundered.
*Lalu helowa dege anda bia howa anda biyagoha hina uyu hayago mo banda halu.*
While it thundered, they finished the houses and gathered sweet potato and put it inside.
*Hina biago mo banda howa, o, hina biago unu mabuha mo banda harua tamu biyagoha.*
When they gathered the sweet potato, they threw it inside the houses.
*Anda bia hayagoha. Au buwa hobaki howa, wali hangu agali hangu lowa.*
When the houses were built, they divided them in two, one side for men and one side for women.
*Ogoniha mo banda haruagni.*
They did thus inside.
*Mo banda haruagona howa hina biago nalu badeaya.*
When all were gathered inside, they ate the sweet potato there.
*Ani biyagola mbabuni hina wala hayagoria, ira nai weda dagua warua.*
When all were inside, they placed sticks in the gardens where the sweet potato was planted.
*Ira o weda dagua warua.*
They placed the sticks thus.
*O mbingi hina mulene mbiyare, honowinigo ibugua tagira ibuwa hina bago mialu.*
When they wanted to get the "mbingi" sweet potato", those who were only-children would go out and get this mbingi sweet potato.
*Hina o ngago mialu. Miama mangi biyagola hina bago mo hanalu.*
They would give this sweet potato [to those inside]. When they were tired of gathering it, they would carry it inside.
*Mo hanalu piyagoria howa, o nalu birule obago wigwigi bialu, ogoni ibu tamu wiyaugagua.*
When they carried it inside, they would give it and divide it to each and eat.
*Ani buwa nogo ogoni yu anda ibu birarua.*
Pigs too they brought inside to stay.
*Haru anda ibuwa. Maru bo banda halu tini nole.*
They carried them inside.
*Ani buwa hina mo banda hayago narua.*
Then they ate the sweet potato they had thrown inside.
*Nogo angibunibi ogoniha haru birarua. Anda puwa.*
Sows too they brought in.
*Tau angibunila haru haruagni.*
Boars and sows together they brought in.
*Wali, agali, wane, igini, o, bihende ogoni ha anda ibu birarua ogoni.*
Men, women, daughters, sons, all came inside and sat together.
*Au buwa igiri emene, o, wi heago mini yalu, o, ibalu uyu balamandani hangu palu haruagni.*
Small boys, those with testicles, would be carried over there to the men's house.
*Mebia habe hedagola.*
So that no rules [mebia] were broken.
*Ai, o, balamanda bagra ofa lowa, paliyagola howa wali ibu nde wandiaha paipiaugoni.*
Let them sleep in the men's houses, and the women would sleep in the women's houses.
*Hobaki howa, tu wuwa. Wali agali bimaga nahole.*
They divided the houses in half, placed borders. Men and women could not mix.

*Ani biragola mbiyaore ore honowiningome,*
Those that bore only one child,
*mbiyaore ore ibu hamene mende bi nahegome.*

single children, without brothers,

*o ibu mbiru birayagoni biruwa tagira pialu o ibunaga wa he horombe wiragoni.*

this one child would stay inside for only one day and then would go out on the next day and it would be daylight outside.

*Ti uyu mbi lowa mbilogimbu bu wiragoni.*

For all the others, it would be night.


He would get sweet potato. He would go around and get sweet potato and carry it back inside.

*Kirali, wali agalila, kirali heledaria, o mebia hole biragoni lowa.*

If a man and woman were together, this would break the rules.

*Agalime miaragoni. Hangu hangu.*

Only men gave [i.e. only men were allowed outside to gather sweet potato]. Singly.

*Ani biyagola hina obagoni mo banda haruagoni.*

These people would get sweet potato and throw it inside.

*Mo banda howa nalu biraruagoni.*

When it was thrown inside it would be eaten.

*O [haliru...] kira honowinigo ibu, o kiru biruwa mendeang tagira polebira.*

Of those who slept inside, if they were born with another, they would come out on the second day.

*Tebira honowinigo ibu tebiru biruwa.*

Those from three-sibling sets would stay for three days.

*O mane angi tagira polebira.*

On the fourth day they would come out.

*Maria honowinigo ibu matlu biruwa, dauni angi tagira polebira.*

Those from four-sibling sets would sit for four days and come out on the fifth day.

*Duria honowinigo ibu, waragaria biruwa, kane angi tagira polebira.*

Those from five-sibling sets would sit for six days and come out on the seventh day [the narrator starts to confuse his count here].

*Ai, karia honowinigo ibu, o karu biruwa, halini angi tagira pole.*

Those from seven-sibling sets would sit for seven days and come out on the eighth day.

*Halira honowinigo ibu, o, halira biruwa dini angi tagira pole.*

Those from eight-sibling sets would sit for eight days and come out on the ninth day.

*Ibuha yagi aruma haragola emene biru dai bigi biruagoni.*

If they came out and it got dark again, they would go back in again.

*Au binigo o biagoni ai, gaea biyagola howa haliniangi, ai wa laruagoni.*

So, when they had sat for eight days, dry weather would come and it would clear.

*Hina biago mo banda hayago nalu biruwa.*

They would eat the sweet potato thrown inside.

*Haliniangi, o wa laruagoni.*

On the eighth day it would clear.

*Wa laragola howa, ibu dai biragola hari biago ibu beraliba ibira hayago ibu uyu haruagoni.*

When it cleared, the clouds would go back on top and it would become dry.

*Hari podo pe hayago ibu haya dagua gitimu biaragoni.*

The sky [or mountains] that had broken and come down would join together and go back up.

*Mibirile puya, nogombi, dartara, gau, anda ibiyago ibu, unu tamuha birayago ibu polene hayago ibu tagira iriragoni.*

All the snakes and lizards, when it grew light, would go out.

*Dindi biago ibu ndiibu laruagoni.*

The ground too would be firm again.

*Au bialu iba biago ibu, unu iba pene biagoa iba yolo miaragoni.*

The rivers would return to their courses.
Gimbubu wiyago ibu, hari biago ibu yu dai biarugoni.
The mountains and the land would be separate again.
Ani biyagola dindi ogo mo gimbu bini laya.
Then the land would be whole again.
O, mbingi penego ialu. Mbingi penego ogoni.
It is said that this is how mbingi came.
NARRATIVE B9 - The Water of Life

"The Great Flood", C.E.T.Terrell, Lake Kutubu PR 3-53/54, pp.17-18

In the beginning everyone lived in the country as they do now. One day, while the women were sitting around the fire in their house, water started to come up through the fireplace. They were very frightened and ran outside and told their men. The men came and saw it, and found the water pouring out of the ground like a river. They were very frightened because quickly the water joined other rivers, and they began to rise and rise, and as they rose they covered all the low ground and then the mountains too, and everyone was drowned. Quite often nowadays when women are digging in the ground they find old ashes and stone axes. These belonged to the people who perished in the flood.

When everyone was dead, the floods went down again, and one day the sun came down to the earth, and saw that it was a good place, and wondered why there weren't any people. He made a little clay figure and left it on the ground and went away. The next morning he came back and found a man there and he said "Who are you and where do you come from?" The man replied that he had always been there because it was his place, and that he [was] the only one. The sun said "You weren't here when I came yesterday" and the man answered that this was his place. As they were talking the sun made a model of a woman out of clay and put it on the ground. Then he went away and came back in the morning, and found a woman with the man. When he asked where she came from, the man replied that she had always been there, so the sun asked why he hadn't seen her yesterday. The man replied, "She has always been here". When the sun found that they did not have a house or a garden he told them to make one, and to have children. He said, "I will go away now, but later when I come back and call you must answer me."

In time the woman had a baby, and the same day the sun came again. Four times he called "HAPANJA" (Meaning "Live person's mother") [habe ainya: mother of life], but they did not answer him. He got angry and threw the gourd he was carrying onto the ground and it broke. Then he called "HOMAPENJA" (meaning "Dead person's mother") [homabe ainya: mother of death] and the woman answered. The sun then asked "Why didn't you answer before?" The woman did not reply, so the sun went on, "In that broken gourd was water which if you had given it to the child meant you would never have died. However you did not do as I told you, so now give the child milk from your breast, and in time you and the child will die." Then the sun went away and did not come from the sky again.
NARRATIVE B10 - Decline of the Earth

Timothy Meria (Homa), 17.4.91, 91/6A:376-420

_Ina ayu bamba ala hama ibimadago._

How we were from before till now.

_Ibu ibu bialu, o Hela Obena o ibalu,_

Coming thus Hela Obena came,

_o ina andagani dahe momogo bialu, Hulu Gumaiyani dahe ibalu,_

we met them at our place, within Huli land.

_Mi Duna momogo bialu, Hulu Gumaiyana dahe ibalu._

Duna too we met in Huli.

_Dugu Yawini bialu momogo bialu._

Duguba too came and we met here.

_Aguani bialu, o bamba dindi o ngamagani piningi pili pialu._

After the tenth generation, the land fell.

_Piningi pili mialu, ibame napenego. Ibame nalu no wa henego._

On the tenth time, the water drowned them. The water drowned and finished them.

_Ayu o mani haragola, piningi pilarangi haragola howa._

Now, afterwards, on the tenth generation it will fall again.

_O iba Ngaruni togo wuwa, iba emene uru, Iba Gabia uru, Iba Girabo uru, Iba Gumugu uru, ogoni olu paliwa togo wuare beremi._

At all these small rivers you will call out and gather and bridge them,

_O lo paliwa togo wiazu kemi anji haragola howa._

When the time for calling out, gathering and bridging comes,

_o Hari Ambuani howa, o Giginawini ge dagima biragola howa,_

at the mountains Ambua and Giginawini, one leg will be placed at Giginawini,

_Hari Ambuani ge mendego paga haragola howa, Urunawini._

another leg at Ambua, and the head at Urunawini [Bari Yumu]

_o manda tene edegoriani paga haragola howa._

where the wig [head] will fall.

_O ogoni anji haragola howa ibulebira o dindi ogoni anji ko holebira._

At this time, it will come, the ground will go bad.

_Ko haragola howa, o bereba holebira, ogoni anji pili pialu bereba holebira aguani lenego, uruni tagira pialu._

When it falls everything will be finished.

_Haeapuni o haeala paya bulebira._

At Haeapugua, we will spread.

_Mogorowadapunini momogo bulebira._

At Mogoropugua, we will gather.

_Daliwallapunini dai lolebira._

At Dalipugua we will turn back.

_Bira anji howa ge dagima biragola uruni anji bereba holebira aguani lenego._

When a leg is placed at each place, at this time, all will be finished.

_O ayu bereba hole manda manda biya._

Now the end is nigh.

_Haeapuni o dangi ibulebira, dangi ibulebira._

At Haeapugua dangi [Imperata cylindrica] and dangi [Gleichenia milnei] will come up.

_Urupuninaga, Haeapuninaga, Tolowardapunini, Daliwallapunini, Mogorowadapunini._

At Urupupugua and Haeapugua, on the "coast" [Tolowardapunini: "the salt water river"], at Dalipugua and Mogoropugua,

_uruni anji yagua ibulebira, dangi ibulebira, balimu ibulebira, gambe ibulebira._

_yagua [Pteridium aquilinum], dangi [Imperata cylindrica], balimu [Melastoma affine], and gambe [Miscanthus floridulus] will grow._

_Uruni ibiyaguna howa, o bereba hayada lowa manda bibe._

If you see these you will know that everything is going to end, it was said.

_At Iba Uria u u lolebira, ogoni u nale bereba holebira._

The rapids at Iba Uria [on the Tagali river] will no longer call out _u u_ [i.e. they will dry up].
Aguani bulebira laša binigo. Uruni y nale bereba hayagoni. They said this would come about. Now the sound is gone. Bereba hai hayaguwa homa polebere. If it ends completely you will die. O biba ogoni angi holebira. Piningi bamba pilin penegi. All will end at this time. Before it fell on the tenth time. Ayu angi bi pilin polebirago. Now it will fall again. Pili polebira aguani lo hemaria, o ndo. But will it fall as was said on the tenth time? No. Ogoni angi emene bolangua holebere halene daba ogoria nahale holene holebira waneigini honowerog. This time, at the thirteenth generation, the children will not listen. O wandari honowerego emene bida ore, andu ibulebira. The small daughters that you marry will grow breasts. Igiré emenego wi iri angari ibulebira, hambu iri ibulebira. The small sons will grow pubic and facial hair. Wali ai dagedage ala dabu bigi bulebira. Women will marry young. Ini ke ore, dagua ala ibugu bulebira, ge lagoli ko holebira, ne polebira. You will be here, white hair will come, knees will break, teeth will break. Uruni angi haragola howa, ainya lara ore, mbalini lara ore, aba lara ore, hamene lara ore, At this time, 'Mother' will not be said, 'Sister' will not be said, 'Father' will not be said, 'Brother' will not be said, yagayaga bibe, bagabaga bibe, naganaga bibe, but [instead] all will be raped, killed and consumed. Ai aguani bialu, [... ka ore howa o ge dagima bulene ibulebirago. When this happens, the two legs will come. Ogoni angi haealo waholebirago. This time they will carry and pour away everything. Haealo wahalu bereba holebira aguani lenego ogoni haealo waholene, ayu tagira inu nga. This pouring that will come is happening now. Ai bagabaga bulene ayu tagira ibu nga. The killing is happening now. Naganaga, bigibigi, wandagimene gali damene ogoni ka ore, wene hamburi angarila nai bida ore. The eating and fighting, the children with hair, Wali ala dabu bigi. Ala honowigi. Women marry early, bear children early, Daga ala laga bigibigi bialu, ogoni ke ore bereba holebira lenego. Count swiftly, all will end. Henene ayu tagira ibiragani, nahale holene, ayu tagira ibu kagoni. Truly [henene] it is now, the time of not listening is now. Ayu homa pole. I abanaga mana wintdagola, Now all will die. This is my father's mana tuguli manala ogo bi labolabol tagira ibu ngaru, udu mana ayu tagira poragola, and it has come out as one together with the mana of the church. I aba manala ngola haya. O biba. Ayu biba harabagani. Ogoni hangu. My father's mana as well. All of us. Now we will all be finished. This is one [talk].
NARRATIVE C1 - The Origins of Hewai Falls

Piwa-Gomengi (Honomani), 28.8.91, 91/19A:22-31

Iba Tagali peneyago, o Haeapugua birime halu,
The river Tagali which flows, once it filled Haeapugua
wali agalinaga dindi anda uru naya.
and ate the land and houses of men and women.
Iba Gobe uru, Iba Gugubalu uru, Iba Darama uru, Iba Tereba uru,
The rivers Gobe, Gugubalu, Darama and Tereba too,
ogoni birime howa, momogo biyagola gibibereene Iba Garai uru.
they all sat there and, when gathered with the Garai river too, they became enormous.
Gibi birayagola, dungume hayagola,
Having swelled up to a great size and spread out [dungua ha: to flatten out],
ai burugu lalu wali agalinaga dindi anda uru nayagola,
it [the water] covered all the houses and land of the men and women and ate them.
Ai agiha pe loobe toba howa, mini burugu to wiaria.
Ai, how could they drain this water, they were at a loss.
O wane labo bambu ganage, wane labo mbira bereneyagome.
Before there were female water spirits [wane labo] and one of them sat there,
Emene ore henge ngerogo, pole ibu lowa, ge dagi dagi biyagola.
'Now I shall make a little space for you, so you can come through', she said and she
spread her legs a bit.
Doni pe henego. O ayu ngagoni.
It drained away. Then it was as it is now.
NARRATIVE C2 - The Tani-Bogorali War: a Tani Version

Darama-Pudaya (Pi tene, Tani Lebe yamuwin), 20.10.89, 89/1B: 0-28

Bogoraliia Tanila wai binigo.
Bogorali and Tani fought a war.
O nogu uru Birimanda bopene.
A pig was killed at Birimanda.
Birimanda bopuwu o nogu biago Bogorali no go homa pene
After this pig was killed at Birimanda all of the Bogorali pigs died.
Birimanda puwua nogu homa piyagola
After he [Ngoari-Bualu] went to Birimanda and the pigs had died,
o nogu yani tauwa ibiya dago lowa
after the pig sickness [yani] had come,
i nogu homa piya lowa nogu darama hongoni.
it was said that they had died of the blood [poison] of his [Ngoari-Bualu's] pig.
Nogu hongo pulupa la Gai'la nogu nai Haeawi ange ogoria hina ibira hearia.
Over there beside the Haeawi river at the place where Ngoari-Gai [Tani Tuguni tene]
threw food for his pigs they blew on to the pigs' fodder [nogu hongo: Job's tears].
Obagoria o nogu darama biago hambu yu ibira hayagola no go yani bini.
The poisoned blood was brought to this place to make the pigs sick.
Ani byagola wai bii. Bogorali Tanila.
This having been done, war started between Bogorali and Tani.
Wai biwu o nogu palibango dawa lowa ede Waloanda ni mandagi dawalut hene.
When the war had been fought, they cooked truce pigs [nogu paliago] together over
there at Waloanda.
Dawalu hearia Bogorali ge hamua bi kiralime.
When these [pigs] were being cooked, two Bogorali lepers spoke.
Wandari waribaru uru, igiri abinalu uru, nogu bodawulu uru
'When brideprice is given, when compensation for the slain is eaten, when pigs are
killed,
puguni namiaga kira hene gome,
they are not given to the two of us.
I aba o Baru-Mbiyago uru, Hului-Tabugu uru, Maiya-Golia Domalia uru, Goloba-Habe
uru, Gambe-Aluia uru, hahandanda bi gume,
Your aba kin: Baru-Mbiyago, Hului-Tabugu, Maiya-Golia and Maiya-Domalia,
Goloba-Habe, Gambe-Aluia [all Tani Hebaria yamuwin], these [lineages] gathered,
Dabura-Pago Gurubu uru, Aya-Obara uru, Dali-Hira uru,
Dabura-Pago and Dabura-Gurubu [Tambaruma tene, Tani Doromo yamuwin], Aya-
Obara [Tari Agiabu yamuwin], Dali-Hira [Tari Agiabu yamuwin],
Balimu-Nebara uru, Hundia-Pangobi uru, Dabu-Pilaba uru, hahandanda bi gume,
Balimu-Nebara [Tari Dindiago/Angareere yamuwin], Hundia-Pangobi [Mabiali tene,
Tani yamuwin], Dabu-Pilaba [Tani Doromo yamuwin], these lineages all gathered,
Maiya-Toneya uru, Darama-Ayu uru, Abu-Payabu uru, Uguma-Guriyaba uru,
hahandanda bi gume,
Maiya-Toneya [Hubi tene], Darama-Ayu [Pi tene], Abu-Payabu, Uguma-Guriyaba,
these men [all Tani Lebe yamuwin] gathered.
Egerebagi, ibuwa bori dago, i Yuna Lai haru,
In the morning, you came to kill, I was at Yuna Lai,
Aguma Lai haru, Uludima Tawate diba harugo.
at Aguma Lai, at Uludima Tawate [in Pedra, Karida areas]/
Wai emene ebero lowa ge hamuabi gifta, wai gelepe hayane.
I [we] have come to make this little war,' said the lepers, 'I have run here to fight.'
Au byagola wai biyagola.
This said, the war was started [again].
Mendego Iba Galowa iraga halu, mendego Iba Tagali doma ade hayagola
One climbed Mount [not river] Galowa, and the other crossed the Tagali river.
Bogorali Tanilame wai mobia hene nogu nahambua haga urume, hina nahambua haga
igiri abi nalu nahambua hagame.
'Let Bogorali and Tani fight, for when they ate pork or good sweet potato as compensation [igiri abi], they gave nothing to us.'
Wai mo bia henegc. Mo bia hayagola.
These two started the war. Thus it was started.
O Ngoari-Egayu uru, Ngoari-Begayu uru, Ngoari Ninimali uru, Ngoari Gebo uru,
Ngoari-Egayu, Ngoari-Begayu, Ngoari-Ninimali, Ngoari-Gebo [all Bogorali tene sub-
clans]
Hono-Libi uru, Tabeda-Bara uru, Maiya-Mogia uru, Kuari-Debule uru, hangu pugu
pilalu,
Hono-Libi [Honomani tene], Tabeda-Bara, Maiya-Mogia (Munima tene), Kuari-Debule
[Dolo tene], each of these [all Bogorali yamwine] fled,
Tanime podalu Iba Tagali ange ede yagi, ubade helene, ubade hayagola,
Tani broke them and chased them over there to the banks of the Tagali river,
o ede heagome Bai Mole uru, Bai Dagabua uru, Bai Yalo uru
over there, with [Bai Mole: unidentified clan], Dagabua, Bairama
Mo Gedani uru, Tagga uru, Aulungu uru, ede heagome lalu.
with [unidentified clans at Puren] over there.
Iba ange ede yagi heagome lalu.
Over there on the banks of the river.
I Hubi Ngoari ni hagia dela abo hare dago.
[The Puren clans said] 'You [Bogorali] were always making smoke up there at Hubi
Ngoari mountain.
Hari ebere ngogoria, hagua deloleni tene.
You made smoke at this mountain over there.'
Hagia deloleni layagola o biru nde iba gendo uru nalu hagua tabu lalida layagua
When this was said about the smoke, [the Bogorali refugees replied] 'If you [their
Puren hosts] say once that the water here has turned bad because we drink it
wandari yango igiri wabe uru hari weda layagua biru
or if you remark that the kin of our brothers and sisters are like the mountains [i.e. too
numerous],
Hagia tigida, Haea tigida, Hiribi tigida, Wayabi tigida, Gono tigida, Mogono tigida,
Lai tigida, Lagu tigida,
then we will follow [i.e. return to] the Hagia, Haea, Hiribi, Wayabi, Gono, Mogono, Lai
and Lagu [all rivers],
handa daidai biaguago.
we will look back to them [i.e. return].'
Piru yawa nde biaguago lalu Yale Togo,
'If I go [from Bogorali ground], I will go completely', said Bogorali [Yale Togo]
piyagola dindi aribia lalu.
and when they left we [Tani] took over this land.
Hengenego Ngoari-Hewago handa, Ngoari-Doromo handa, Ngoari-Dabo handa,
Ngoari-Egago handa,
This land was taken by [literally: "seen by"] Hewago, Doromo, Dabo and Egago [the
Tani clans]
Ngoari-Eli handa, Ngoari-Agiabu handa, Ngoari-Angarere handa, Ngoari-Dindiago
handa, Ngoari-Abiya handa, Ngoari-Boroba handa, Ngoari-Yanga handa, Ngoari-
Tabayia handa, Ngoari-Tuguni handa, Ngoari-Wangane handa, Ngoari-Hara handa,
Ngoari-Endeli handa, karu lalu hangalu,
by Eli, Agiabu, Angarere, Dindiago, Abiya, Boroba, Yanga, Tabayia, Tuguni,
Wangane, Hara and Endeli [Tani sub-clans]
Yale Togo, Cu Tagali togo gandula pehenego dindi ina mini nai wimagoni.
We cut the Tagali bridge to mark the border with Bogorali [Yale Togo] and took their
land.
A Synopsis of Narrative C2:

At the same time that Ngoari-Bualu (Tani *tene*) killed some of his own pigs, some Bogorali pigs died of illness. Bogorali thought that Bualu's pigs had also died of sickness and were the source of the epidemic that had killed their pigs. They took some of the pigs' blood and rubbed it on a bush of Job's tears (*Coix lacryma-jobi*, favoured pig fodder) near the Haeawi river outlet, where Ngoari-Gai (Tani Tuguni *tene*) looked after his pigs. Tani saw them doing this and a fight lasting two days ensued. On the third day, a truce was called, and pigs were exchanged and eaten at Waloanda (Tani Hagu land). Then two Bogorali lepers turned up and complained that they never received their share of any pork distributions. They successfully got the fight going again before fleeing, one across the Tagali, the other over Mt Galowa. Bogorali were routed and fled across the Tagali to seek refuge with Bairama, Dagabua and others of their aba kin on the Pureni side. The Pureni people told Bogorali that there had always been cloud over Mt Hubi Ngoari when Bogorali were there (cloud here as a metaphor for smoke, which stings and reddens the eyes, itself a metaphor for being permanently enraged and at war). Bogorali said to Tani that if their welcome at Pureni wore thin, if their Pureni hosts said that they drank all their water, or if the Pureni people persisted in reminding Bogorali that the pandanus was theirs, Bogorali would follow the Hagia, Haea, Hiribi, Padabi, Gono, Mogono rivers, come back to Lai, Lagu (near the Garai), that they would return to claim their land. The Tani sub-clans split up the Bogorali ground amongst them and felled the bridge over the Tagali river to signify the finality of Bogorali's flight.
NARRATIVE C3 - The Tani-Bogorali War: a Bogorali Version

Ngoari-Hebe (Bogorali Egaya), 8.2.91, 91/1A: 150-250

Tani Bogoraliwa wai binigo.
Tani and Bogorali fought one another.
O hambuni ndo bi, tomianu ndo bini, purini ndo bini.
We [Bogorali] didn't use hambu, or tomia, or puri [all poisons].
Tani Bogoraliwa bini dago Bogorali ibu nogo bo yalu.
This war between Tani and Bogorali happened because Bogorali killed and took a pig.
Baibuali pene, Baibuali penego dai bialu hearia.
[Some Bogorali men] went to Baibuali and then came back.
Tani Ngoari Doarigonaga, ira Bogorali me pelo wearia galagolo hariga pelo wearia mo yalu ibini.
The Bogorali men took some firewood cut and left by the roadside by a Tani man, Ngoari-Doarigo, and carried it.
Yalu ibuwa wandari dege taribuyagola dindi Waloanda ogoria wa ho hene.
He had no sons, only daughters, and they carried the wood and placed it at Waloanda [for him].
Mo dindini mo ngelene anda bi lo.
They planted the wood in the ground as if to build a house.
Mo ngeleria agali mbirame ogoriani howa.
When they planted it there, a man was there.
Ira biago, Bogorali me dindi tu wialu denge hanganda halu piyadago lene.
'Bogorali are using this wood as a boundary marker [denge]', he said.
Ani layagola, Tani hondole nguai hene.
When this was said, all Tani gathered to see it.
Bogorali me yobage bialu biyada lene.
It was said that Bogorali were making an allusion [yobage: "veiled talk/action"].
Ani layagola yobage biyada layagola nguai hayagola. Denge hanganda halu piyagola hende.
It was said thus when they all gathered and saw this denge border mark.
O ibuwa ke hene. Kg halu, o biagoria howa, kg halu. Lalu hene.
There was talk to find out who had done this and they talked and talked.
Obagoria howa lali howa horo mbiru kg halu hene, horo mende angi obagoria howa ke halu howa, ke howa.
A first time they talked [ie held a moot] and did not find out who had done this, and then a second time they talked and did not find out who had done it.
O Tani Bogoraliwa tigi tege lo, wai bini.
Then Tani and Bogorali started to quarrel [tigi tege] and a fight started.
Wai bialu o wai bini dagoni. Wai bialu howa o walu purogo lene.
The fight started and they fought. After they had fought, it was said, 'Leave it, I'm going' [ie. let's call a truce].
Wai bialu howa o walu purogo iowa nogo nigiri uru dawalu ibu wene.
The fight ended and compensation pigs [nogo nigir] were killed to stop the fight.
Dawalu hearia ayu dalu ibira dagu ore ibiyagola alendo hole ibiya yagi agali mbiru ibini.
They were cooking [the pigs] in the afternoon, as the rain came, when a man came up.
Baru-Yabule came up and said, 'What are you doing?'
'His [Tani's] kin, Mai-Mogia [Munima tene], Mai-Toneya [Hubi tene], Embo Hini [?], Abu-Aluwai [Wenani tene?], Mai-Yoromo [?], Bari-Ambu [?] and Aya-Obara [?] all live close by [ie Tani had the numbers at hand during the fight].'
Abale ha andalu biyada lene ibu damba bi lalu.
He gave a damba bi speech and said that these lineages had come and stopped the fight.
I Ulutima Yagua haruya, Pedaro Gabua haruya, Yuna Lai haruya, Aguane Togo
haruya, Biala Togo haruya, Nale Togo haruya, Handala Togo haruya, Bala Togo layadago, Gambe Ele wiridarunaga,

While I was at Ulutima Yagua, Pedaro Gabua, Yuna Lai, Aguane Togo, Biala Togo, Nale Togo, Handala Togo, Bala Togo and Gambe Ele [i.e. all distant locations],
i hondo poliya lalu yandare ngula\lalu la\ lalu ba a\ hene.
you did thus so I have come to see where you were fighting’, and he threw his spear
down and it made a noise [ngula\l].
Nogo nigi dawalu hearia. Ani laya.
They were cooking the compensation pigs and he said thus.
Bogorali abu ge hamua hamuabi mbirame au lene.
This Bogorali kinsman, who was a leper, said thus.
Au layagola howa, bialui wa haribago, nogo nigi dawaraba layagola, danda bai
hayagola.
When he said thus, they replied that they had killed and cooked the compensation pigs
and threw aside their bows.
Piurugo layagola dau tiri heneyago, kulukulu layagola amu wiagoniha.
Five rows of men had come [with the leper] and over where they were the ground shook
[kulukulu].
Tani andaga gele wia haya.
They went straight into [i.e. invaded] Tani ground.
Gele wia hayagola, Tani nde manda mandabu beragoria ndobe biribu auwalanda
hayagola agaloi labo ni biagoria de ni hene kuni laribigoni wai obagoria lere le pe
haribigoni.
When they went in, Tani were ready and there and it was a great fight; when
arrows pierced them in the eyes they ignored them and kept on fighting.
Bogorali a aquabere i nogo nigi dawalu henego layago.
[Tani said] ‘Bogorali, what are you doing? We have already cooked the compensation
pigs.’
Ngoari-Aguna handa, o danda ba a\ halu.
Ngoari-Aguna [Bogorali tene] threw his bow aside.
Amu nogo, wai bia\o wa halu ya lalu i amu poro lalu i boga lalu amu bagoria pidiri
pedere bini.
‘Leave the fight aside; if you want to fight then just shoot me’ he said, and he rolled
down to where they fought.
Bogorali Ngoari Aguma handa.
The Bogorali man Ngoari-Aguna did thus.
Au biyagola bai a\ halu hearia Ngoari Luni abale tegelepe heneyago mbirame ge pau\ini dugua bene.
But soon someone shot Ngoari-Luni [Tani Hebaria tene] in his calf [ge pau].
Dugua byagola bamo dago hondo ha yamo dago lowa dabamia dage lalu nogo biago
gibu payapayabu dawa payabu ngelowa, dabamia dage bamogo hondo ha laya tirigi
tigitega lene bolangua bolangua haga bini timuka abale.
Some sat and said, ’This is no great thing, it is just small, let us talk and kill pigs.’ ’Let us
divide our pigs’; but others kept shooting, and the arrows flew swiftly in both directions
[bolangua bolangua].
Bolangua haga biyagola o Tani ibu Bogorali horombe pelole lowa.
When the arrows had been shot, Tani swore [horombe pelole] as they had before that
they would oust Bogorali.
Maiya-Dimbu, Maiya-Toneya handa toro\ halaga biangonga.
Maiya-Toneya [Hu\si tene; Tani yamuwin\i] had performed divination rites [toro, halaga,
biangonga] for Maiya-Dimbu.
Bu yu heasome.
He already held it [the result of the divination].
O Bogorali ogoni angi, Luni bara angi, polene lowa, wai Pela Pagola waini.
At this time, when Bogorali shot Luni, Pela and Pago [two Pureni clans] were fighting
together.
Dimbunaga, Toneya ibu toro\ uru halaga uru biangonga uru bu yu henego.
Toneya performed toro, halaga and biangonga [forms of sorcery and divination] for
Dimbu and held it.
Bu yu howa, ai Bogorali polene angi dago.
When it [the result of the divination] was held, then it was time for Bogorali to go.
Polebira, Ngoari Luni balu, polene lafu ala toro, halaga biangonga uru bu yu hene emaga uru hondo yu hene.
This that he held would kill Ngoari-Luni with toro, halaga and biangonga and then they would rout them [Tani].
Ai Luni bo ibira hayadago, Tani hilimia lene.
They said now we have killed Luni and we shall rout Tani.
Au biyagola Tani hilimiyagola.
When this was done, Tani fled and then regrouped.
Bogorali shot Luni and then the war between Tani and Bogorali grew huge.
Luni bogalu Bogorali polene, lene bagoria.
When Luni was shot, Bogorali would go, it was said.
Anti biyagola, Toneya handa, lo wiyaogoria, piyagola, Maiya-Toneya handa, ai pelaro lene.
When this happened, Toneya said now Bogorali must go.
Hubi, Tani aba, Maiya-Toneya ogoni.
This Hubi man, Maiya-Toneya, was an aba kinsman of Tani.
Tani lai emene dago hangu bidibale iya hinimagaho / bimagaho? holene wini.
If we had fought a small war only with Tani, we could have stopped it and stayed.
Hubi Toneya handa pelene. Ibu hame Dimbunaga.
It was Hubi Toneya who made us go, in revenge for his father Dimbu.
Pela Pagola wajuria pelene dagoni.
They were routed when Pela and Pago fought.
Anti biyagola howa wai Bogorali balu, amu yagi Ngoari-Luni bamu hea dagoni.
When they fought, Bogorali shot Ngoari-Luni over on that [Tani] side.
O Ngoari-Ayaga bamu hene. Ngoari-Gai bamu hene.
Ngoari-Ayaga [Bogorali] was shot. Ngoari-Gai was shot.
O yagi ida Baru-Langini ima, Dali-Dabugo ima.
On that side Baru-Langini and Dali-Dabugo were shot.
Ora bawa ka agali. Deria labolabo haleria balu togo lene.
Thirteen or fourteen: on each side were killed.
Balu ogoni angi, balu, ai Bogorali pe la.
When they were killed, it was said that now Bogorali would be evicted.
Bogorali udu Hari Ngoariba biago pinha heremiai hene.
Bogorali were camped up there at the base of Mt.Ngoariba [behind Walete mission].
Miai hayagola, Tani Ngoari-Luni handa, uyura, puwa, nogo bo yu iraga hene huliga.
Before, Ngoari-Luni had killed a pig and taken it up to huli [the Tari basin].
Uyura huliha pialu hearia. Igiri emene kira Ngoda Hadala.Iba payalu beraria hendene.
When he came up to huli, he met two small boys, Ngoda and Hada, who were damming water.
Ai gene dege haqa berogoni.
Now I'm giving a branch of this story.
Puwa, igiri emene kira ogobila ogobila iba payalu yago gara mbira bo mu howa dugu bialu hearia iraga hene.
When he went, he saw that the two little boys had been playing like this and like this [ogobila ogobila] at damming water and that they had killed a frog [yago gara; unidentified sp.] and built a mourning hut for it.
Luni handa bamba Luni nahome howa.
This was before, when Luni was alive.
Madaba andaga Ngoari-Luni halu Tani nogo bo yu pene ibalu hearia.
At Madaba parish, Ngoari-Luni had killed a pig and he was returning.
Yago mbola biago mu ho ngelowu Ngoda Hadala.
Ngoda and Hada had put this frog thus.
Mu howa. Dugu bialu hearia iraga hene.
The two were mourning when he came.
A agua berebe lene.
'What are you doing', he said.
Waru biago domo wa howa pai dandabuni kira, payani ogoria hahalu.
He cleaned the mud from them and put two roasted pork strips [dandabuni] on their shoulders.
Puguni biarume, abene biarume, hai howa halenego, igiri emene biago labo.
He gave the two some meat and some fat which he put on their bodies and left them.
Ai o biago labo ore, manda ho, Ngoari-Luni mbira baray laguagha igiri emene biago labo ibabe, hale halibu lenego.
When he did thus, he said, 'If, when you are older, you hear that someone is beating
Ngoari-Luni, you must come.'
Manda ho hearia, Luni benego.
When the two had grown full heads of hair, Luni was killed.
Bogorali balu, Luni balu ede Ngoariha biagoha here muwa aguwa bialu hearia.
When Bogorali killed Luni they were camped at Ngoariha.
Ngoda Hadala biagome, Luni bo mu ka layagola hale howa igibu udu Madaba andi
hari udi wiagoria howa Hari Ambuani howa, glil lene.
When Ngoda and Hada heard that Luni had been killed, they mourned him at Madaba and
then they went over there to Mt.Ambua and brought [cane] from there.
Yalu ibuwa hari udu Ngoariha udu mbaria udu ika udu mbaria udu heagoria andiba
hene.
They brought this cane to Mt.Ngoariha and tied it [andiba] to a tree at the top.
Andiba howa irabu ede, ege tene biagoria pu giilape hene.
They tied it and rolled the other end of the cane down the limestone cliffs.
Hale tiri udu bagoria ju kululupe hene.
When they had done this, they leapt down from above.
Bogorali udu herene hego helipe howa wu, Birimanda guriya he dagoria Tagalin
helepe halu, Bogorali ogoni angi biniyi o biba hene.
They routed Bogorali, chasing them over there to Birimanda where the hoop pines are,
to the Tagali river, and chased Bogorali off entirely.
Biba hayagola howa, Bogorali ibinigo ogoria o kogoni amugoria penego ka edegoria
penego ka uduagoria penego ka.
When they were finished there, Bogorali came here, to where I am now [in the Koroba
basin], to over there, down below where they are now.
Iya wai waleri emene bialu hebaria.
It was only a small war that the two of us fought.
Toneya ibu hadu daga howa podene.
Toneya [Hubi] started this fight and evicted us.
Bogorali puabo holeni len.
Some Tani said, 'Bogorali should not leave altogether.'
Wai bini dago. O Pomia binigo. Pomia igini Giwa, Giwa igini Madabi ka, i hamene.
This fight we fought with Pomia [a Tani fight-leader]. Pomia's son Giwa had a son
Madabi, my kinsman who is alive now.
Bogorali pu abo oleni dai bilo abale dege dai biabo ha la lu birabo henego. Beda.
'Bogorali, do not go entirely, come back before too long,' they said, and stayed. They
[Tani] stayed [on Bogorali ground].
Luni dago andiane ogoni, Gunini ka. Gunini igini Agilo ka.
The leader of Luni's line is Gunini. Gunini's son is Agilo who is alive.
Agilo handa ibu lalu i hamene ibu lalu birabo ka.
Agilo has said, 'Brother, come back'.
Giwa handa lalu birabo henego biralu homayagoni. Iginu ayu beda.
Giwa said 'Come back' but he is dead now and his sons are there now.
Ogoni angi Bogorali biba henego ayu ibinigo o kamagoni.
When Bogorali left we came here where we are now.
Ina aba wandari laruru bihendeme o dindi Ngoariha wuwa, Walete beda.
The daughters of our aba [i.e. our yamuwini, the descendants of our mother's brother's
dughters] are at Ngoariha and Waleti.
O iya ogoni hambune mbira nabi, purime nabi, toniame nabi.
We didn't fight with hambo or puri or tomia poisons.
Dandame daliga biba dagoni.
We fought openly [literally: "on top": daliga] with bows.  

*Ba i hene oba hole kaba mbiru haba layagua Walete dai bu harabada angi, Lunila mbiru nogol molola howa agubule kaba.*  

If we went back to Walete we would pay compensation for Luni.  

*Ibu nogol noaba layagua. Mangaba layagua yamo dindi uru holole kabagoni.*  

If he wanted pigs [ie would accept compensation]. If he said 'No' [mangaba], we would stay as nothing [yamo] on this ground.  

*Au latu ibugwa mi tangiba layagua bulebereba, nlayadagwa iya.*  

If it is said [by Tani], 'We are still remembering' [Luni’s death], then we will pay, if not we will stay here.  

*Ayu horo uru biba kalu agali timbuni dai birago hamene lowa.*  

Now the days are almost over and the Big Man [God] will come back, so we will say,  

'Brother'.  

*Gi tigali bu hole keba.*  

We will shake hands and stay together.  

*Noaba layagua nde, Bogorali mebira ago buwa hamene o "muni" dagabi mbira tagu ngero lolebira.*  

If they say they want compensation, Bogorali will give them money ['muni' (Tok Pisin)] compensation.  

*Ndo, mangaba layagua mandagi palue bereba, bu migi buwa.*  

If they say, 'No', we will sleep together anyway, sleeping face to face.  

*Harha kagome ani bilibu leda, wa howa palue kabagoni. Ngode handa au bilibu leda.*  

God says 'Live in peace together', so we will throw away these old ways. God has said thus.
NARRATIVE C4 - A Bogorali Lament

Ngoari-Hebe (Bogorali Egaya), 8.2.91, 91/1A: 117-134

Bogorali ibu aba, Bogorali Yale Togo ibu aba
The aba kiin [ie yamuwiniri] of Bogorali, of Yale Togo, [including:]
o ibu aba Mai-Mogia uru, Kuari-Dolo, Baru-Yabule uru,
Mai-Mogia [Munima], Kuari-Dolo [Dolo], Baru-Yabule [Yobiya],
Haro-Mamage uru, Dal-Ngawe -Halumala uru, Yaliduma-Loria -Waberalu uru,
Haro-Mamage [Haro], Dal-Ngawe [Gaiyalu] and Yaliduma-Loria [Dagabua],
Ibara-Agabu and Ibara-Yaba [Halialii], Dal-Nai and Dal-Domabe [Gobiya] and Bibi-
Handabe [Munima yamuwinin], I left them all there.
Iba Hagia ange, Abago angeange, Hiribi angeange, Gendo angeange, Bara angeange edera haledogu.

On the banks of the Hagia, Abago, Hiribi, Gendo and Bara rivers [in the former
Bogorali parish] I left them there.
I ini maane pene kogo parane uruni iba uruni angeha o kogo lalu heledogo.
Myself, I departed, but I left small roots along the banks of these rivers.
Uruni ha kago, Yale Togo uruniha hai kago, I ini o kogo.
They are there, [and thus] Yale Togo [Bogorali] is [still] there. Myself I am here [at
Dalipugua].
Hari ogo piniruhu kogo [igiri yango ibinigo], nogo nabaloole ibinigo, wandari payalole
ibinigo, igiri yango lole ibinigo uruniha kogo.
At the base of this mountain, I came to eat pork with them, to befriend [literally:
"shoulder"] their daughters, to befriend their sons, those who are here.
Mane edere yagi wia, parane edere yagi wiaha, dai bule kago.
Some of the root [ma] I left there, some of the branches I left there, for I will go back.
Abu uruni uru ede wiai kogo.
All these kin, I left them there.
Hubi Ngoari inagazo, inaga ngogo.
Hubi Ngoari mounain is mine.
Iba Padabi, i hamenaga bulini duginogo.
Padabi river springs up from the heart of my father.
Iba Dere / Deriaanda inaga bedogo tindule lalu koria ge hamua bulene uru burayu
holene uru, amali holene uru, ti tu bulenego, iba Dereanda ale, dere bulenego.
Where the Dere river runs is mine and if I am lying [tindule la] may I get leprosy, may I
get tuberculosis [bura: breath; yu: short], may I get chronic bronchitis [amali], may my
nose run [tu tu], may I get sores [dere] like [i.e. the size of] the Dere river itself.
Ogorini berelelo Yale Ga\ Hubila ngo, Hubi Ngoari Dane inaga udu ngogo, ogoni
panigi ore ngogo.
Here I leave the mountains Yale Ga\ and Yale Hubi and Hubi Ngoari Dane, this is
quite clear [panigi] [ie open knowledge].
Iba Hagia angeni, iba ameyia mialu haabo holebira, i aba o larorume.
On the banks of the Hagia river, my kin used to fish for tadpoles [iba ameyia].
Iba Bara angeni, iba ameyia mialu haabo holebira.
On the banks of the Bara river, they used to fish for tadpoles.
Iba Gendo angeni, iba ameyia mialu haabo holebira.
On the banks of the Gendo river, they used to fish for tadpoles.
Dindi uruni Yale Togo inaga ngo.
These places belong to Yale Togo.
Ai i aba uruni ha hele dogo
I left my kin there
Mai-Mogia handa, mgloomolo birabo ka.
Munima still stays there [literally: "is seated there continuously" (molomolo)].
Baru-Yabale handa, yabuyabulo haabo ka.
Yobiya is there to divide out [yabuyabulo] the pork [ie when they do this we will
come].
Kuari-Dolo handa, didolo haabo ka.
Dolo is there, restless [didolo].
Habono Miaro handa, miamiaho birabo ka.
Miniba is clearing [miamiaho] the way.
Iba Gindira handa, gundigundibu hundi yabunga.
Iba Gindira looks back wistfully [gundigundibu] towards us.
Haro Mamaga handa, mamagaho nga.
Haro clan keeps watch [mamagaho] for us.
Dindi Hubi Ngoari inaga, Iba Hagia inaga.
The land, the mountain Hubi Ngoari is mine. The river Iba Hagia is mine.
Au ngo ogoni ngo.
These are mine.
Au lalu ini, urunihwa howa bi agali adogeha howa ladabero.
Now I am beneath the arm of another man [i.e. I am yamuwini here] and only my words go back to there.
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