The incidence and distribution of malaria among westerners in Irian Jaya
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Management of cerebral malaria in the Karubaga primary health center,
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Paul Haenen
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The incidence and distribution of malaria among westerners in Irian Jaya

William H. Markle MD

Introduction

The incidence of malaria is currently on the rise world-wide. As a relatively new physician working in Irian Jaya, Indonesia, I have been very concerned about the high incidence of this disease and the severity of the cases that I see. Since my patient population encompasses predominantly westerners and missionaries who are living in Irian Jaya, I elected to survey this group of people to get a better idea of the status of malaria in Irian Jaya and how medicines are currently being used.

Materials and Methods.

In August 1988 a survey was sent out to the expatriate families in Irian Jaya of which 154 questionnaires were answered and returned to me. The questionnaires assessed the area of Irian Jaya the family reside in, how long they have been there, their current use of malaria prophylaxis, and the experience with malaria including the experience of all family members. Also I attempted to determine what type of prophylaxis was used when malaria occurred and what type of treatment was used that was not affective in preventing recrudescence. I assessed the common symptoms of malaria for people on and off prophylactic medication.

Finally, there were also several questions relating to the malaria situation in general and perceptions regarding resistance and most useful drugs. These questions were slightly more technical and often not answered.
Results

Experience of malaria in various geographic areas:

Irian Jaya was broken up into three types of areas: Highlands (Central Highlands and Arafak Hills areas), Coastal areas and offshore islands, and swamps (including the South Coast and the Northern Swamps). The experience of malaria for people living in these areas is shown in Table 1.

<table>
<thead>
<tr>
<th>Area</th>
<th>Responses</th>
<th>Malaria</th>
<th>Nomarella</th>
<th>Falciparum</th>
<th>Vivax</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highlands</td>
<td>55</td>
<td>39</td>
<td>16</td>
<td>29</td>
<td>241</td>
<td>51</td>
</tr>
<tr>
<td>Coast</td>
<td>71</td>
<td>48</td>
<td>23</td>
<td>32</td>
<td>314</td>
<td>107</td>
</tr>
<tr>
<td>Swamp</td>
<td>28</td>
<td>27</td>
<td>1</td>
<td>4</td>
<td>290</td>
<td>113</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>114</td>
<td>40</td>
<td>29</td>
<td>845</td>
<td>271</td>
</tr>
</tbody>
</table>

For cases of cerebral malaria the numbers were: Highlands - 2 (1%), Coast - 3 (1%), Swamp - 9 (5%), and Total 14 (1.8%).

This shows the highest incidence of malaria in the swampy areas as expected, but also shows the incidence in highland areas virtually the same as the coast which was not expected. The large number of unknown types of malaria is due to the fact that blood slides are not easily obtained in the highlands and swampy areas but are easier to get in coastal areas. There was a significant difference however in that P. vivax was slightly more common in the highlands and coastal areas but P. falciparum was much more common in the swamps.

This same data can also be listed by districts (kabupaten) in the district map. These are administrative districts in the province.

Table 2 shows the same data but more regionalized. The case totals are different because it wasn't always clear from the questionnaire what type of area the malaria occurred in. One interesting aspect is the significantly higher incidence of P. vivax in the Manokwari and Yapen-Waropen districts, compared with a fairly even distribution in other areas and a predominance of P. falciparum in Merauke.

Effect of length of time of residence

I then looked at the effect of length of time of residence in Irian Jaya on the incidence of malaria. These results are shown in Table 3.

<table>
<thead>
<tr>
<th>Time of Residence</th>
<th>Total</th>
<th>Have had malaria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 6 months*</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>6 months - 2 yr.</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>2 yr. - 5 yr.</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>5 yr. - 10 yr.</td>
<td>31</td>
<td>27</td>
</tr>
<tr>
<td>Over 10 yr.</td>
<td>56</td>
<td>56</td>
</tr>
</tbody>
</table>

*All those listed as under 6 months had actually been in Irian Jaya less than 3 months.
As expected this shows a gradual increase in the risk of malaria which tends to level off between 5 and 10 years with 87% of people experiencing malaria by that time. Interestingly by just 2 years of residence over half of the respondents had experienced malaria.

Weight given malaria slide results

A question was asked about whether positive blood slides were ever reported when the patient had no symptoms and thus no treatment initiated. 102 (94%) reported that this had never occurred and only 6 (6%) said that it had. However when asked if they had ever had a negative slide report but felt they had malaria anyway 38 (36%) reported yes and 27 (25%) reported no. Of those saying yes 87% initiated treatment despite a negative blood test. This shows that while weight is given to positive slide results, somewhat less weight is given to negative results if the individual’s clinical condition suggests malaria.

I then assessed the symptoms of malaria that people experienced, comparing those on drug prophylaxis with those who were not on prophylaxis when malaria occurred. These results are shown in Table 4.

### Table 4. Symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Those on prophylaxis Total 131</th>
<th>No Prophylaxis Total 29</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>121</td>
<td>28</td>
<td>100%</td>
<td>71%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>118</td>
<td>21</td>
<td>90%</td>
<td>71%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chills</td>
<td>104</td>
<td>24</td>
<td>79%</td>
<td>86%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weakness</td>
<td>89</td>
<td>17</td>
<td>66%</td>
<td>61%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweating</td>
<td>82</td>
<td>17</td>
<td>63%</td>
<td>61%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achines</td>
<td>88</td>
<td>17</td>
<td>50%</td>
<td>61%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td>65</td>
<td>8</td>
<td>50%</td>
<td>29%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td>39</td>
<td>8</td>
<td>30%</td>
<td>29%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stomach Pain</td>
<td>13</td>
<td>4</td>
<td>10%</td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrhea</td>
<td>24</td>
<td>2</td>
<td>18%</td>
<td>7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td>6</td>
<td>2</td>
<td>5%</td>
<td>7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fussiness (Babies)</td>
<td>5</td>
<td>1</td>
<td>4%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convulsions</td>
<td>4</td>
<td>3</td>
<td>3%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blurred Vision</td>
<td>2</td>
<td>2</td>
<td>2%</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest Pain</td>
<td>2</td>
<td>2</td>
<td>2%</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>1</td>
<td>1</td>
<td>1%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unconsciousness</td>
<td>1</td>
<td>1</td>
<td>1%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1</td>
<td>1%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I interpret this as showing no significant difference between the two groups, although headache and diarhea were more common in the group on prophylaxis, while fever, chills and achiness were more common in those on no prophylaxis. The GI symptoms (vomiting, diarrhea, and abdominal pain) tended to be more common among children.

### Types of Prophylaxis used

I then tried to assess the use of drug and mechanical prophylaxis. Although it was obvious that prophylactic measures were used more aggressively in highly malarious areas and among those who had experienced more malaria, it was impossible to determine which drugs or measures were most effective. See Table 5.

### Table 5. Types of Prophylaxis used at some time

<table>
<thead>
<tr>
<th></th>
<th># users</th>
<th>% users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroquine + Dapsone</td>
<td>78</td>
<td>47%</td>
</tr>
<tr>
<td>Chloroquine alone</td>
<td>42</td>
<td>25%</td>
</tr>
<tr>
<td>Dapsone alone</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Paludrine</td>
<td>6</td>
<td>4%</td>
</tr>
<tr>
<td>Chloroquine + Malatrom</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Camoquine + Dapsone</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Chloroquine + Paludrine</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Malatrom</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Papaya Leaf Tea</td>
<td>1</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Looking at mechanical measures tended to show the same type of results, that is those with greater risk of malaria tended to use more precautions. See Table 6.

### Table 6. Types of protective measures used

<table>
<thead>
<tr>
<th></th>
<th># users</th>
<th>% users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screens + insect sprays</td>
<td>30</td>
<td>23%</td>
</tr>
<tr>
<td>Screens only</td>
<td>25</td>
<td>19%</td>
</tr>
<tr>
<td>Nets + screens + sprays</td>
<td>21</td>
<td>16%</td>
</tr>
<tr>
<td>Insect spray only</td>
<td>15</td>
<td>11%</td>
</tr>
<tr>
<td>Nets + screens + spray</td>
<td>13</td>
<td>10%</td>
</tr>
<tr>
<td>Long sleeves at night</td>
<td>10</td>
<td>7.5%</td>
</tr>
<tr>
<td>Screens + nets</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>Screens + sprays + long</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Sleeves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screens + nets + long</td>
<td>2</td>
<td>1.5%</td>
</tr>
<tr>
<td>Sleeves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nets + spray</td>
<td>2</td>
<td>1.5%</td>
</tr>
<tr>
<td>Screens + long sleeves</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Nets + long sleeves</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Nets + spray + long</td>
<td>1</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

There were cases of malaria among people who were using all the various medicines and protective measures. Table 7 summarizes the usage of medical and mechanical protective measures.

### Table 7

<table>
<thead>
<tr>
<th></th>
<th># users</th>
<th>% users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Families using both</td>
<td>111</td>
<td>(73%)</td>
</tr>
<tr>
<td>medicine and mechanical prophylaxis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Families using medicine but not mechanical measures</td>
<td>26</td>
<td>(17%)</td>
</tr>
<tr>
<td>Families using mechanical measures but not medicine</td>
<td>8</td>
<td>(5%)</td>
</tr>
<tr>
<td>Families using neither</td>
<td>8</td>
<td>(5%)</td>
</tr>
</tbody>
</table>
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Type of Prophylaxis when malaria occurred:

Of more importance is the type of prophylaxis which was used at the time when malaria occurred. This is displayed in Table 8:

<table>
<thead>
<tr>
<th>Table 8</th>
<th>Prophylactic drug used when malaria attack occurred</th>
<th># malaria episodes</th>
<th>% Total</th>
<th># cases cerebral malaria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroquine + Daparin</td>
<td>54</td>
<td>34%</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Chloroquine alone</td>
<td>46</td>
<td>29%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Daparin alone</td>
<td>9</td>
<td>5%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Campquin alone</td>
<td>11</td>
<td>7%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Paludrine</td>
<td>4</td>
<td>3%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Maloprim</td>
<td>3</td>
<td>2%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Maloprim + Chloroquine</td>
<td>2</td>
<td>1%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Maloprim + Chloroquine + Paludrine</td>
<td>4</td>
<td>3%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Farnsider</td>
<td>1</td>
<td>0.5%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>13%</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>No prophylaxis</td>
<td>21</td>
<td>13%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When this is compared with the number of people who have used these medicines we see the results in Table 9:

<table>
<thead>
<tr>
<th>Table 9</th>
<th>Prophylaxis</th>
<th># Users</th>
<th>%-age</th>
<th># with malaria</th>
<th>%-age</th>
<th>Ratio # with malaria/# users</th>
<th>Ratio % with malaria/% users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroquine/Daparin</td>
<td>78</td>
<td>47%</td>
<td>54</td>
<td>34%</td>
<td>.65</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>Paludrine</td>
<td>6</td>
<td>4%</td>
<td>4</td>
<td>3%</td>
<td>.67</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>Chloroquine/Maloprim</td>
<td>6</td>
<td>4%</td>
<td>2</td>
<td>1%</td>
<td>.33</td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>Daparin alone</td>
<td>9</td>
<td>5%</td>
<td>9</td>
<td>5%</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Chloroquine alone</td>
<td>42</td>
<td>25%</td>
<td>46</td>
<td>29%</td>
<td>1.1</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>No prophylaxis</td>
<td>16</td>
<td>10%</td>
<td>21</td>
<td>13%</td>
<td>1.31</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>47%</td>
<td>13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

By this it can be seen that the risk of getting malaria is highest with no prophylaxis and is lowest on the Chloroquine-Maloprim combination. Chloroquine-Daparin and Paludrin also appear to be acceptable prophylaxis. However, these are trends only and due to the small numbers involved, these are not significant differences.

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Recrudescence after treatment.

I then asked the question: Have you experienced a recrudescence or relapse of malaria within two weeks after treatment? 36 people (52%) answered yes to this. Drugs that were taken as treatment when recrudescence occurred are shown in Table 10:

<table>
<thead>
<tr>
<th>Table 10</th>
<th>Drug</th>
<th>#</th>
<th>%-age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroquine alone</td>
<td>22</td>
<td>49%</td>
<td></td>
</tr>
<tr>
<td>Farnsider</td>
<td>5</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Chloroquine + Farnsider</td>
<td>4</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Quinine alone</td>
<td>3</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Chloroquine + Daparin</td>
<td>2</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Tetracycline alone</td>
<td>2</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Quinine + Tetracycline</td>
<td>2</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Campquin + Farnsider</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Chloroquine + Quinine</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Quinine + Farnsider</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Chloroquine + Quinine + Tetracycline</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>

Thus recrudescence can occur with virtually any treatment regimen although most commonly with Chloroquine and/or Farnsider.

Questions regarding malaria among the general population

Finally several questions were asked regarding malaria in the area as opposed to personal experience. These questions were: Is malaria a big problem in your area? If so, predominantly what type? Does it respond readily to drugs? Which drug is best for treatment in your area? Which drugs are frequently not effective? Has malaria ever not responded to treatment and if so what treatment? Do you feel a new drug is needed for treating malaria in Irian Jaya? These results were tabulated by district in Table 11:

<table>
<thead>
<tr>
<th>Table 11</th>
<th>Is malaria a problem?</th>
<th>Does it respond readily?</th>
<th>Need a new drug?</th>
</tr>
</thead>
<tbody>
<tr>
<td>District</td>
<td>Yes</td>
<td>No</td>
<td>NR*</td>
</tr>
<tr>
<td>Jayapura</td>
<td>23</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Merauke</td>
<td>17</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Manokwari</td>
<td>7</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Sorong</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yapen-Waropen</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Jayawijaya</td>
<td>11</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Paniai</td>
<td>6</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: 67 (59%) 29 (25%) 19 (16%) 37 (33%) 31 (27%) 48 (45%) 51 (45%) 15 (13%) 48 (42%)

* No response.
### Table 12
**Most common types of Malaria**

<table>
<thead>
<tr>
<th>District</th>
<th>P. falciparum</th>
<th>P. vivax</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jayapura</td>
<td>5</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Merauke</td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Manokwari</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sorong</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yapen-Waropen</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Jayawijaya</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Panai</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16 (32%)</strong></td>
<td><strong>14 (27%)</strong></td>
<td><strong>21 (41%)</strong></td>
</tr>
</tbody>
</table>

### Table 13
**Best drug for treatment**

<table>
<thead>
<tr>
<th>District</th>
<th>Chloroquine</th>
<th>Quinine</th>
<th>Fansidar</th>
<th>Tetracycline</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jayapura</td>
<td>16</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Merauke</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Manokwari</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sorong</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Yapen-Waropen</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jayawijaya</td>
<td>10</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Panai</td>
<td>4</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44 (47%)</strong></td>
<td><strong>31 (33%)</strong></td>
<td><strong>7 (8%)</strong></td>
<td><strong>5 (5%)</strong></td>
<td><strong>6 (7%)</strong></td>
</tr>
</tbody>
</table>

### Table 14
**Drugs often ineffective**

<table>
<thead>
<tr>
<th>District</th>
<th>Chloroquine</th>
<th>Daraprim</th>
<th>Fansidar</th>
<th>Tetracycline</th>
<th>Quinine</th>
<th>Paludrin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jayapura</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Merauke</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Manokwari</td>
<td>5</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sorong</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Yapen-Waropen</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jayawijaya</td>
<td>6</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Panai</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28 (64%)</strong></td>
<td><strong>3 (7%)</strong></td>
<td><strong>6 (18%)</strong></td>
<td><strong>1 (2%)</strong></td>
<td><strong>3 (7%)</strong></td>
<td><strong>1 (2%)</strong></td>
</tr>
</tbody>
</table>

### Discussion
Certainly these results demonstrate the seriousness of the malaria problem in Irian Jaya. From other information we know that malaria is the primary cause of illness, causing 18.7% of total mortality. It is responsible for 16% of hospital admissions, 14% of hospital deaths, and 20% of outpatient consultations. Transmission has been found up to an elevation of 1700 meters. The information in this paper shows that malaria is extremely common among foreigners living in Irian Jaya despite the use of prophylactic drugs and mechanical measures. It is most common in swampy areas, but it is also quite common in both highland and coastal areas. One problem with this study is that the population surveyed is quite mobile and although they may permanently reside in one type of area, they may make frequent trips to other areas. It is not always possible to tell where the malaria was contracted. In general the malaria experience has been pretty even between P. falciparum and P. vivax, except that in Manokwari and Yapen-Waropen there is more P. vivax, and in Merauke more P. falciparum. A majority of people surveyed in each district felt that malaria was a big problem but that generally it did respond readily to treatment. The exceptions were in Merauke and Manokwari, where a majority felt it did not respond readily. A majority in each district except Sorong and Yapen-Waropen felt that a new drug is needed to combat malaria. Although Chloroquine is still felt to be the drug of choice in most areas, quinine is not far behind. Chloroquine has both the highest incidence of being ineffective for treatment and the highest incidence of recrudescence within 2 weeks. Fansidar is also frequently ineffective and a cause of recrudescence.

Finally, the trend was to a slight benefit from Chloroquine-Daraprin, Paludrin, and Chloroquine-Maloprim combinations per drug prophylaxis. Nevertheless, cases of malaria have occurred with virtually all prophylactic regimens including cases of cerebral malaria.

This work points up the need for better methods of malaria control. Much could still be done in the highly populated coastal areas in the way of sanitation and water management to reduce the mosquito population. However, in the isolated swampy areas probably the only practical method would be to resume spraying of houses, but even this would be extremely difficult and costly. New methods of prophylaxis and treatment are urgently needed, but resistance seems to develop rapidly. I tend to agree with one respondent who said, "Let's just get rid of the mosquitoes, then no drugs and no malaria."

### Endnotes
1 The author is sponsored by the University of Cenderawasih and the Summer Institute of Linguistics Cooperative Program. He arrived in Irian Jaya in January of 1988 after 10 1/2 years as a family practitioner in the United States.

Management of Cerebral Malaria in the Karubaga

Primary Health Center Jayawijaya District

Sudjito, M.C.
Health Department
Karubaga, Primary Health Center

Dari Februari 1987 sampai dengan Februari 1988 ada 31 orang yang menderita penyakit malaria cerebral di Karubaga (21 laki-laki, 10 perempuan, umur rata-rata 26,9 tahun, dari 3 tahun sampai dengan 56 tahun). Dalam jumlah 8% hanya dalam pemanfaatan penderitaan darah untuk malaria.

Perubahan dengan infus Kina Dihydrochlorid tambah Dexametasonas yang tinggi dibentuk kepada 8 pasien yang bagian. Angka kematian pasien tu adalah 22.5%. Namun, infus dengan intramuskular (dalam rentang 200-300 mg) Kina Dihydrochlorid dan Dexametasonas diberikan dengan beberapa hari, setelah 24-28 jam. Kemudian, pasien yang sudah membaik infus Kina Dihydrochlorid dibawa pulang oleh keluarganya, dengan memperhatikan upaya untuk mencegah penularan kembali.

Sumber penyakit yang berakhir menunjukkan bahwa titubuh pasien malaria cerebral yang berat akan jumlahnya pada tahun 1987 bagi penelitian mungkin ada di lanjutan selanjutnya. Kemudian, usaha epidemiologi didasarkan pada titubuh pasien tersebut berkering dengan cepat. Tetapi ada banyak factor-faktor yang harus dianggap sebagai penyebab hasil yang baik ini.

Kemudian setelah 4 bulan untuk laporan malaria cerebral, tiba-tiba timbul penyakit tu lagi setahun sesudah laporan kemoterapi yang disebabkan oleh "penyakit yang tak dikenal".

Summary

From February 1987 to February 1988, there were 31 cases of cerebral malaria reported at the Karubaga Primary Health Center – (21 males, 10 females, mean age 26.9 years, range 3 - 56 years, only eight had blood examinations for malaria).

Treatment with Quinine Dihydrochloride infusion and a high dose of Dexamethasone was given to the first 8 patients. The mortality rate was 37.5%. Another procedure then was performed, i.e. Intramuscular injection of Chloroquine-Antipyrin 25% without the addition of Dexamethasone. The mortality rate was 20%. One patient who was treated with intramuscular Quinine was taken away by relatives and died in his own village before receiving adequate treatment. A simple epidemiological study found that the increasing incidence of cerebral malaria in early 1987 was probably a focal outbreak. Some epidemiological efforts were then performed and the incidence dropped sharply, but there were many factors to be considered.

I. Introduction

Cerebral malaria, a fatal form of malaria caused by Plasmodium falciparum, became a serious focal outbreak in some areas of the districts of Karubaga and Jayawijaya, Irian Jaya during the period February to June 1987.

The Central highlands of Irian Jaya are known to be "relatively clean" from malaria. Until February 1987, this unknown disease was thought to be a result of viral infection which local health workers called "flu". Cerebral malaria was suspected in February 1987, and became a clinical diagnosis after evidence supported this suspicion. There are many theories and procedures in treating cerebral malaria, among which are the use of Quinine Dihydrochloride infusion, Dexamethasone infusion, and Intramuscular injection of Quinine.

In such a situation as the Karubaga Primary Health center, not all theoretical procedures are practical. Experience has proven the best method, no matter how far from the theories.

II. Malaria in Karubaga

There was no available data about the malaria situation in Karubaga until March 1987. From April 1987 to February 1988 an incomplete malariometric study was done, with the following data regarding the types of parasites found and the number of people with enlarged spleens.
A. Parasite Rate
Data obtained from a blood survey April 1987 - February 1988:

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. of persons examined</th>
<th>No. of positive blood slides:</th>
<th>SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pf</td>
</tr>
<tr>
<td>0 - 11 mo.</td>
<td>53</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>12 - 23 mo.</td>
<td>12</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2 - 4 yrs.</td>
<td>48</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>5 - 9 yrs.</td>
<td>81</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>10 - 14 yrs.</td>
<td>49</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>15 yrs+</td>
<td>271</td>
<td>58</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>514</td>
<td>128</td>
<td>88</td>
</tr>
</tbody>
</table>

Infant parasite rate (FPR) = Transmission index = 5/53 x 100% = 9.4%

Children parasite rate (CHR) = P.R. 0 - 9 yrs. = 49/194 x 100% = 25.3%

Total parasite rate = 126/514 x 100% = 24.5%

Parasite Formula P. falciparum + mix = 89/126 x 100% = 70.6%

B. Spleen Rate
Data obtained from a Spleen survey July 1987 - February 1988:

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. of persons examined</th>
<th>No. of persons with spleen size (n)</th>
<th>n x size of the Spleen (n = 1-5) = A E S (m3/mm3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>12-23 mo</td>
<td>18</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>2-4 yrs.</td>
<td>91</td>
<td>63</td>
<td>8</td>
</tr>
<tr>
<td>5-9 yrs.</td>
<td>284</td>
<td>237</td>
<td>14</td>
</tr>
<tr>
<td>10-14 yrs.</td>
<td>113</td>
<td>97</td>
<td>3</td>
</tr>
<tr>
<td>15 yrs+</td>
<td>117</td>
<td>101</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>623</td>
<td>514</td>
<td>29</td>
</tr>
</tbody>
</table>

Note: A E S = Average Enlarged Spleen
N = number of people with enlarged spleens in a certain age group

1. Spleen Rate (S.R.) 12 - 23 months = 2/18 x 100% = 11.1%
2. S.R. 2 - 4 years = 28/91 x 100% = 30.8%
3. S.R. 5 - 9 years = 47/284 x 100% = 16.5%
4. S.R. 10 - 14 years = 35/375 x 100% = 9.3%
5. S.R. 10 - 14 years = 18/113 x 100% = 14.1%
6. S.R. 15 years and over = 16/117 x 100% = 13.7%

Looking at the Spleen Rate of the 2 - 9 years age group (i.e. 20%), Karubaga is a Mesoendemic area of malaria.

C. Cerebral Malaria Cases in Karubaga

Within one year (February 1987 - February 1988) there were 31 cases of Cerebral malaria. Since there was no qualified laboratory technician available in Karubaga, most of those diagnoses were merely based on clinical signs and symptoms and only eight of them had laboratory confirmation.

The evidence that strengthened the diagnosis of Cerebral malaria was the death of two patients who did not receive any antimalarial drug.

Some criteria used in making the diagnosis of Cerebral malaria were:
1. Severe disturbance of the level of consciousness; e.g., obtundation, stupor or coma.
2. No sign or symptom of other disease or trauma (except meningitis—as a differential diagnosis).
3. A history of fever and chills.
4. Physical signs of hemolytic anemia.

The absence of either point 3 or 4 did not exclude the diagnosis of Cerebral malaria, but their presence strengthened the diagnosis.

In April - May 1987, there were reports of many deaths (probably 50) in Nilenma, an area two days walk north from the center of the district. The symptoms were similar to those reported before. However, since there was no clinical proof, those cases were not included in this report.

D. It was a focal outbreak

The conclusion of a focal outbreak was made according to the locations where patients with cerebral malaria came from, since at first most of the patients lived in a group of villages; i.e., Kogume, Wuragi, Leraiga, Guindi, and Karubaga. Later, this disease seemed to spread westward to nearby villages; i.e., Kwa and Mengenga.

III. Clinical management of Cerebral malaria in Karubaga

There were two different procedures performed in treating Cerebral malaria in Karubaga during the period February 1987 to February 1988:

A. Quinine Dihydrochloride + Dexamethasone Infusions (February to April 1987)

1. Dose and administration

On admission, each patient was given either a Dextrose 5% or Dextrose 10% infusion as the first fluid replacement, followed by Normal Saline or Ringer's lactate intermittently with Dextrose. The flow rate was estimated according to the individual patient's condition.

Quinine Dihydrochloride was given 10 mg/kg body weight every 6 hours in 500 ml saline, Dextrose or Ringer's lactate infusion.

Dexamethasone was given through infusion between the Quinine infusions at a dose of 3 mg/kg b.w. for the first dose, and then 1 mg/kg b.w. for the following doses.

2. Reasons:

   a. The only literature/references available at that time were:

      1) A lecture handout from medical school which mentioned Quinine Dihydrochloride + Dexamethasone infusions as the treatment of choice in Cerebral malaria.
      2) Namru's double blind controlled trial of Dexamethasone in Cerebral malaria, Jayapura May 1st, 1982 - June 1st, 1983.
      
   b. There are theories which say that quinine should not be given by intramuscular injection unless I.V. infusion or very slow I.V. injection is impossible. Absorption from the intramuscular site is unpredictable and local abscesses often develop (WHO 1984; White 1983:155-157).
   
   c. The use of either Dextrose 5% or 10% as the first step of fluid replacement is based on the theory which says that hypoglycaemia often accompanies cerebral malaria. The result of hyperinsulinaemia is compounded by enormous obligatory glucose
requirements of the developing malaria parasites, and of hyperinsulinemia stimulated by Quinine (White 1983:155-57).

B. Chinin antipyrin Intramuscular Injection without Dexamethasone. (Used during the period May 1987 - February 1988)

1. Dose and administration.

On admission, fluid replacement was performed similar to the I.V. method. i.e., Dextrose 5% or 10%, followed by Normal saline or Ringer's lactate intravenously. Intramuscular Injection of Chinin Antipyrin (Quinine Hydrochloride 25% + Antipyrin 12.5%) was given into either the patient's buttocks or lateral thigh at a dose of 10 mg/kg b.w. every 8 hours.

2. Reasons

a. Research in Madang and Goroka Hospitals, Papua New Guinea by Drs. John Stace et al. on serum levels of Quinine following I.M. administration to children had this conclusion: Quinine is rapidly absorbed following intramuscular injection, and this is a safe and reliable method of administering the drug to children with cerebral malaria (Stace et. al. 1983:23).

b. Personal consultations with Dr. Jerry Powell (Immanuel Hospital, Mula) and Dr. Tiger Silaban (Chief of the Health Department, Jayawijaya district) resulted in these conclusions:

1) Good results were obtained in treating Cerebral malaria without using any steroid (in Mula).
2) Some sudden deaths following I.V. administration of Quinine Dihydrochloride occurred in Wamena.

c. Practical reasons. It is easier to give an Intramuscular injection than an Intravenous infusion, especially for such a situation like the Karubaga P.H.C. with very few well trained health workers.

C. Adjuvant treatments/management

1. Oxytetracycline injections (I.M) were given at doses of 100-250 mg every 12 hours for adult patients, and Procaine Penicillin at doses of 50,000 IU/kg b.w. every 12 hr. instead of Oxytetracycline for children.

Reasons:

a. Oxytetracycline or Procaine Penicillin was used as a prophylactic antibiotic for secondary infection because there was no adequate aseptic procedure during the treatment. (Most of the patients were treated in Darii huts.)

b. A combination of Quinine and Tetracycline derivatives probably has some beneficial effects for patients with malaria.

2. Treatment of special manifestations/complications

a. Acute pulmonary edema (one patient).

* Semi recumbent position.
* Furosemide (Lasix) drip 1 mg/kg b.w. in 500 ml Normal Saline slowly. (The edema diminished within 10 hours after Furosemide administration).

b. Hypostatic Pneumonia (one patient).

* Oxytetracycline injection was changed to Procaine Penicillin at a dose 100,000 IU/kg b.w./day, divided into 3 doses. (The pneumonia improved within 3 days).

c. Hyperactivity (one adult patient in obduction).

* Phenobarbital Intramuscular Injection 100 mg. (Hyperactivity stopped, 6-8 hours after that he became comatose and died the next day. He was treated with the I.V. method.)

d. Haemoglobinuria (She was the patient mentioned in point a.)

* Nothing special was done. (The Haemoglobinuria disappeared gradually in 12-14 hours).
* Hematemesis and abortion (one female 16 yrs, 5 m. pregnancy).
* Vitamin K 10 mg I.V. injection was prepared, but she died before receiving the injection.

3. Supportive care:

a. Urinary catheterization (not all patients)

b. Changing the patient's position to prevent pressure sores (not all patients).

c. Preventing the patient from being given food or drink while in an unconscious state (Failed in two patients, but fortunately both survived).

D. Post-come management

1. As soon as each patient was aroused from her/his unconscious state and was able to swallow drugs, Quinine injections (I.V. or I.M.) and the Dexamethasone infusion were stopped. Then, each adult patient was given Tetracycline—capsules 500 mg every 6 hours and Quinine Sulphate tablets 400 mg every 8 hours. No Tetracycline was given if the patient was a child, and the dose of Quinine was prescribed for child's body weight (Table 1).

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Dose (every 8 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 12 Kg</td>
<td>1/2 tab</td>
</tr>
<tr>
<td>13 - 17 Kg</td>
<td>3/4 tab</td>
</tr>
<tr>
<td>18 - 22 Kg</td>
<td>1 tab</td>
</tr>
<tr>
<td>23 - 27 Kg</td>
<td>1 1/4 tab</td>
</tr>
<tr>
<td>28 - 32 Kg</td>
<td>1 1/2 tab</td>
</tr>
<tr>
<td>33 - 40 Kg</td>
<td>1 3/4 tab</td>
</tr>
<tr>
<td>More than 40 Kg</td>
<td>2 tab</td>
</tr>
</tbody>
</table>

The Quinine tablets and Tetracycline capsules were given for 5 consecutive days, followed by a single dose of Fansidar according to the patient's age (see Table 2).

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>0 - 1</th>
<th>1 - 4</th>
<th>5 - 9</th>
<th>10 - 14</th>
<th>15+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet</td>
<td>3/4</td>
<td>1 1/2</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

2. Pressure sore treatment, multivitamins, and other rehabilitation procedures were then performed. (4 patients had pressure sores and 1 had contracture of the legs.)

E. Result

1. The total mortality rate of Cerebral malaria was 32.3%, and the specific mortality rates due to the types of treatment given are shown in Table 3.
Management of Cerebral Malaria

Table 3. Mortality rate in every type of treatment

<table>
<thead>
<tr>
<th>Result</th>
<th>IV. Method</th>
<th>L.M. Method</th>
<th>Antibiotic only</th>
<th>Incomplete L.M. Method</th>
<th>No drug at all</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survived</td>
<td>5</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Died</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>1***</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>Mortality Rate</td>
<td>37.5%</td>
<td>20%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>32.3%</td>
</tr>
</tbody>
</table>

*The patient was taken away and died in his own village.
**The patient died before any treatment was given.

2. Age Specific mortality rate.

From the 31 patients with Cerebral malaria (21 males, 10 females), the mean age was 28.9 years, range 3 - 56 years, and the Age Specific Mortality Rate (ASMR) is shown in Table 4.

Table 4. Age Specific Mortality Rate of Cerebral Malaria (Treated & Untreated)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number of patients</th>
<th>ASMR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Survived</td>
<td>Died</td>
</tr>
<tr>
<td>0 - 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 - 4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5 - 9</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10 - 14</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>15 &amp; more</td>
<td>17</td>
<td>8</td>
</tr>
</tbody>
</table>

*Should not be interpreted as statistical data since the sample is too small.

IV. Epidemiological measures to overcome the disease.

Since there was no available data about malaria in Karubaga at the beginning of this Cerebral malaria focal outbreak, every possible measure was performed to stop the increasing incidence of this deadly disease.

During the period February 1987 to April 1987 there were only curative measures performed. Then, with the help of expatriates, better efforts could be made regarding preventive, educative, and diagnostic measures. These were continued from the end of April until the end of June 1987.

A. Preventive measures.
   1. Efforts to eliminate breeding places of Anopheles mosquitoes.
   2. Administration of a preventive dose of Chloroquine to every possible person in the focus area.

B. Curative measures.
   1. Radical treatment with Chloroquine and Primaquine to patients with positive slides for malaria except infants.
   2. Radical treatment with Fansidar and Primaquine to every patient who still had a positive slide for malaria after one course of Chloroquine had been given.

C. Educative measures.
   1. Training for local health workers (health), especially in infusion procedures.
   2. Health education (with the help of expatriates) to people around the focus area.

D. Diagnostic measures.
   1. Collecting blood slides and microscopic examinations.
   2. Referral system.

V. Epidemiological results

There was no certain proof that all the epidemiological efforts were successful. The sharp decrease of cerebral malaria incidence in June - November 1987 (See Figure 1) could be only a result of:

A. The dry season which began mid June until early November 1987.
B. The migration of some families from the focus area to other places (mainly to Danime, Maikki subdistrict).
C. The probable increase in immunity to malaria along with the spread of the disease.
D. The real success of those epidemiological efforts.

VI. Annual outbreak?

There is a tendency to a certain increase of the cerebral malaria incidence annually. With the very limited quantity and quality of health workers, limited drugs and equipment, what then should be done?

![Figure 1: Rainfall, cases of cerebral malaria, and deaths caused by cerebral malaria*](image)

* Period February 1987 to February 1988

VII. Conclusions:

A. Without any statistical test, it seems that L.M. injection of Quinine is more practical than L.V. administration of Quinine dihydrochloride + Dexamethasone in treating Cerebral malaria, especially in a rural Health Center like Karubaga P.H.C.
B. The mortality rate of the L.M. method was 20%, low enough for a situation like Karubaga.
C. A complete epidemiological effort must occur continuously, to keep cerebral malaria cases under control.
Endnotes

1 This paper was presented to the TMF Nurses Seminar held at Pyramid, May 3-10, 1986.
2 Karubaga however, which lies in this mountainous area, has been troubled by many deaths following
comatose states, probably beginning in November 1986.
3 One of them occurred in the district of Tom, although the patient was treated at Karubaga.

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The Yali and their environment

John D. Wilson
RBMI International

Malah berikut ini adalah ringkasan daripada riset melibatkan Yali yang diasosiasikan ke
Universitas Edinburgh. Rangkaian ini melibatkan segi umum orang Yali daripada Irjan Jaya dan membentuk keseluruhan singkat
tentang keadaan dalam masyarakat di pedalaman, kepercayaan agama, organisasi masyarakat, sejarah hubungan dan juga
sebagian sejarah helas. Keadaan sekali, termasuklah geografi dan juga keadaan bawah, jadi perumahan dan kegiatan
panggilan mereka. Kepemimpinan masyarakat dibandingkan dengan sifat kepercayaan orang-orang Mulawit dan juga lagi sejarah seramai. Motif, kehidupan dan kepercayaan merupakan segi-segi penting
masyarakat yang dibahas. Berbagai kategori lisan sejarah seperti puisi, rumus, dafah dan dongeng dianalisis menurut
kategori lisan.

Introduction

The Yali, one of nearly one thousand ethnic or primal peoples or tribal groups on the island of New
Guinea, and one of several hundred in Irjan Jaya, are located in the highlands of Irjan Jaya. The following
paper describes their physical location, aspects of their economic and subsistence activities, religious and
social organization, and aspects of their language and oral tradition. (See map 1:The Territory of the
Southern Yali, and map 2:The Jayawijaya Area of Irjan Jaya.)

Map 1. The territory of the Southern Yali

1. The Yali and Their Environment

The term Yali designates the people who populate the valleys of the northern watershed of the central
Jayawijaya mountain range to the north of the Grand Valley of the Balim river in Irjan Jaya. It also applies
to those who inhabit four valleys of the southern watershed of the same range, whose rivers, the Kwik,
Heluk, Seng and Solo, feed the Balim river near where it leaves the mountains and begins its winding course
across Irjan Jaya's southern lowlands.

Most published material on the Yali to date has focused on those who occupy a specific area of the
northern watershed which is comprised of the Yahuti and Ubahak river systems known as Yalimo "place
The Yali and their environment

of the Yali. It is located roughly between 139° 15' and 139° 30' east longitude and 4° and 4° 20' south latitude (Koch 1967:41, and Zolliner 1977:16-18).

Nevertheless, the more extensive Yali grouping was earlier identified as a linguistic unit, one of the three sub-families of the greater Dani family. It is designated by the term North Ngaiak (Bromley 1967:298). This was the name given by many lower Grand Valley Dani speakers to those living 'outside the rim' or 'outside the ranges' that enclose this wide, isolated, highland valley (Bromley 1977:3-9). The term Yali is not a self-appellation, but is one of two terms which those now so designated use of people in opposite directions on the east-west trade route. Yali means 'those to the east' and is contrasted with Hupla, 'those to the west'.

Three distinct dialects of the Yali language have been identified: the Pass Valley dialect spoken by 5000 people in the northern extremity of the Yali area around Abenatho, in Pass Valley, Landikina and Apamas; the Anggunk dialect spoken by 15000 people in the area known as Yalimo; and the Ninja dialect spoken by 9500 of the southern watershed (Siler and Heikkinen 1984).

This paper focuses on the latter group (those who inhabit the Kwik, Heluk, Seng and Solo Valleys of the southern watershed), based on my own experience and study have been limited to this area. However, in terms of Yali culture, most of what has been described by Koch and Zolliner (Koch 1967, 1974, 1980 and Zolliner 1974) for the Yalimo dialect group is true for the southern Yali also.

The four valleys of the southern watershed are located by the geographical coordinates of 139° 10' to 139° 20' east longitude, and between 4° 20' and 4° 34' south latitude.

The area is extremely rugged. The northern boundary which separates this southern branch of the Yali from its Yalimo neighbours is part of the central range of Jayawijaya mountains which rise to over 4000m above sea level. Spurs from this central range descend in a space of a mere 40 kilometers to the lowlands, which form the southern extremities of Yali territory. The severity of the steep forested slopes and ridges is accentuated by numerous limestone cliffs and outcappings, which in places constrict each of the four rivers into impassable gorges. In the past, travel from one valley to another, and from one side of a valley to the other, was quite limited. This was perhaps more due to the restrictions imposed by hostilities and the rigour of scraping an existence in such an environment than to the difficulties of travel. The eastern boundary of the southern Yali area is a high mountain spur separating the Bolo valley from the Indol valley which is inhabited by the eastern neighbours—traditionally referred to as Yali but now known as Kinyal. The western border is the west side of the Kwik valley where there is considerable intermarriage with their western neighbours—members of an offshoot of the lower Grand Valley Dani. In the border villages of east and west, there is noticeable bilingualism or diglossism. This is not surprising in the west, since Hupla and Yali are both closely related members of the Greater Dani family (Bromley 1967:289, 303). However, the Kinyal language in the east belongs to the Mek languages.

2. Yali Economy and Subsistence

2.1. Settlement

Yali villages are located on ridges between 700m and 2200m altitude. This is because few level places exist, and because higher positions overlook the approaches to a settlement in the event of hostilities. Villages vary in size from several huts housing a population of perhaps 70 people, to much larger villages comprising several dozen huts accommodating 250 to 300 people. The huts are round structures with vertical split board walls and conical roofs thatched with bark, usually topped with pandanus leaves. Central to the structure of the house are four house poles (ke singge) set vertically in the ground in the pattern of a square, which serves to support a sleeping loft and the roof timbers. The ground floor is raised on beams several inches from the ground and covered with pandanus bark (mat). The sleeping loft is usually constructed from bamboo reeds (pinlay) laid on and bound to the ceiling joists, which are in turn fastened with vine near the top extremity of the wall boards. Fireplaces are formed with clay in the square space demarcated by the house poles. One is located on the ground floor for cooking, light and heat, and one in the sleeping loft for heat. Access into a hut is through a small door, which can be closed by slotting loose boards into place.

Most villages consist of several clusters of huts, each cluster or ward comprising a large men's hut, the yuie and its associated women's or family huts, the homia. In addition to the main or 'base' village, there are hamlets and homesteads which Koch defines:

A homia is a group of houses which are temporarily occupied during agricultural seasons by people who have their permanent residence in the 'base' village. A homia, on the other hand is the home of one man and his family who, for one reason or another, moved away from the village and established a permanent residence in one of his gardens. (Koch 1967:45)

Traditionally, the yuie was inaccessible to women, girls and unmarried boys, but is now used in the evenings for informal Christian meetings for all family members.

2.2. Men's Work

The Yali are subsistence farmers involved in a continuous round of cultivation and other activities directed towards survival in a demanding and rigorous environment. A good tight hut is essential for comfort at all altitudes, but especially in the higher villages. The responsibility for building the houses belongs to the men. The actual house building is usually completed in a day. However, prior to the introduction of the steel axe and bush knife, the preparation and collection of materials to build an average homia might take weeks—even months. It took more time if new wall boards had to be prepared.
Other male activities include the making of implements such as the digging stick (klulm) for wives and daughters, adze or axe shafts (yaha omblo), bows (sehen), and arrows, or other useful items such as water vessels (kweg) made from gourds (fobot) or bamboo (fotweap), placed pig tethers (kumbu) and seven pandanus leaf rain-capes (bil). Some of these activities can be carried out by firelight in the evenings.

However, for Yali men, most daylight hours are occupied in gardening work and the husbandry of pigs. This entails clearing virgin or secondary forest by tree felling, and cutting under growth, grasses, shrubs, etc.; moving heavy logs and poles to form crude fences and demarcate sections of land for different owners and users; gathering branches, twigs and roots into piles for burning; and digging the soil with large pointed poles (keam) in preparation for planting. Fences are necessary to keep out both domesticated and wild pigs from those garden areas in process of cultivation or still being harvested. The men also build fences around pig huts (wam obam) and those huts which are used to accommodate pigs in the village. Domesticated pigs usually return to these pens each evening, where they are fed sweet potatoes and other vegetables as available, and then are shut into their huts for the night. In the morning they are let out to roam (timbang wauk) in the forest or gardens left fallow. The men control the breeding of pigs by selecting the breeding boars and castrating the sow (pohali wauk) other young or runty males.

The significance of pigs for the Yali cannot be overstated. It is not so much that the pigs provide nutrition or sustenance, but that they serve to constitute or consolidate social relationships, and are used for cultic-ritual functions (Zollner 1977:39, Koch 1967:12).

2.3. Women's Work

Labour responsibilities for women, apart from the bearing and rearing of children, are mainly gardening and cooking. Male children are under the care of their mothers until they are introduced formally into the society. Often at first light, women leave for the gardens, which may be anywhere from twenty minutes to an hour's walk away. Several net bags (sum) are suspended from their heads to hang down their backs. In one of these might be a racuscape (fif), a cooked sweet potato or two, and a length of bamboo-tubing (fis). During the course of the day, lizards, frogs, grass-hoppers, and other edible insects will be collected in the bamboo tube, in which they will later be roasted. In her hand each woman carries her sharpened digging or weeding stick. On her shoulders or in a net bag lined with leaves, she carries her weaned child. To the women falls the responsibility of planting newly prepared gardens, weeding and cultivation of the various crops, and the bulk of the harvesting. At dusk each day, the women trudge back to the village, up the steep slopes where they have been working all day in blazing sun or in dense shadow. Sometimes a woman will add a pile of sticks or a bundle of cut firewood to the already heavy load of harvested vegetables and the infant sitting on her shoulders or cradled in her arms in order to squeeze as she walks along. Back in the village, the women prepare the evening meal by cooking vegetables in the ashes of the fire, by steam cooking in a bark cylinder (foou) lined with moist leaves, or in a bundle of large hulubi leaves set in heated stones.

In addition to these major responsibilities, the women snatch odd moments throughout the day or in the evenings to roll string (hekhi soal)uk) on their thighs from previously selected and prepared bark and plant fibres. The string is then used to weave net bags (sum yihiruk) or to make string skirts.

2.4. Food

The staple crop of the Yali is the sweet potato (aburu) supplemented with yams (beem), taro (tonu) and bananas (takat).

Animal protein intake is modest and irregular, consisting of the small animals and insects caught and eaten by women, occasional pork (wam ino), marsupial meat (bak ino), bird meat (swo ino), or perhaps the egg of some bird - especially those of a large megapode (belak). The diet is often inadequate as evidenced by cases of kwashiorkor and marasmus.

This is probably partly due to deficiencies in the cultivated vegetables caused by low soil fertility. This is aggravated by the heavy rains which leach the intensely cultivated slopes, which have gradients of 45-60°. General inadequacies of the diet are accentuated by periodic crop reductions and crop failures or losses caused by heavy rains, landslides and crop disease (Zollner 1977:10). Crop reductions also occur when the whole community has been distracted from making new gardens. This can be the result of revived hostilities from other groups or an unusually good yield of another food item such as the mountain pandanus nuts (weream).

3. An Integrated Cosmos: Religion and Social Organization

3.1. Melanesian World View

Much of what has been written in general terms concerning Melanesian epistemology and worldview is applicable to the Yali. Melanesians have an essentially holistic understanding of life, in which both
The Yali and their environment

empirical and non-empirical aspects are always closely associated and are seen to function in an integrated relationship. Thus the Melanesian's worldview is of an integrated cosmos including living and dead people, spirits, animals, plants, mountains, streams, etc. (Whitehead 1986:48-68). The focus of Melanesian religion is the 'continuation, protection, maintenance and celebration of Life, Life with a capital L' (Whitehead 1986:91). The Melanesian is not concerned with just biological existence, but with cosmic life and renewal, where there is spiritual and physical well-being experienced in all aspects of the integrated cosmos. This is achieved through the ritual maintenance of right relationships with man and spirit, living and dead, and the accumulation and balanced distribution of indigenous wealth. These are "technical means to a spiritual end" - a life of peace and harmony, and of general well-being of the group (Whitehead 1986:54-57). They are the Melanesian Search for Salvation, where salvation is the realization of a cosmos in which all things and all beings are in perfect equilibrium.

This religious worldview is generally based on myths which interpret or explain present conditions in terms of historical-mythical events which disrupted the pristine past. These give rise to a hope of reestablishment of those lost conditions, or the expectation of an improved future situation which is, in effect, a recovery of that pristine age. What John G. Streiten writes in Search for Salvation about Melanesian cargo cults is generally applicable to Yali religion:

The salvation which is sought embraces such things as deliverance from present troubles and oppression, peace, wholeness, healing, health and well-being. This salvation will be achieved when the ideals models for man's behaviour and his social institutions which were established in the historical or mythical past are actualized and restored in the present age (Streiten 1977:65).

3.2. Yali myths

Siegfried Zöllner, who worked for fourteen years among the Yali of Yalimo, and whose definitive work Lebensbaum und Schweinekult is the only, but comprehensive, publication about Yali religion, has rightly focused on the Yali oral tradition of myths and sacred formulae and songs as the key to an understanding of Yali religion. He has observed that Yali religion consists of these two layers 3. The mythology of the 'primal age' explains the origin or creation of the Yali people through the killing of the Yali people. Each myth is realized in a series of rites in which the ritual killing of a pig is central, and the purpose of which is to recall the origin and to confirm the existence of Yali society. The second corpus of myths focuses on the Yeli, which Zöllner calls Urbaummyth (primal tree mythology), because in Yalimo this mythology narrates the killing of the Yeli tree, through which the primal period of earth was brought to an end. Among the southern Yali a much more elaborate Yeli mythology exists: Yeli is also a rock pillar which is felled; a primal pig (war) or echidna (adb) which is shot 10 and in one version, a giant earthworm (dung), but the focus is the same as in Yalimo. Medicine men (ap hewlo) 16 realize this mythology in ritual treatment of sick people and in other ritual acts which are directed at preventing or countering adverse circumstances such as unusually severe inclement weather. This threatens the welfare of Yali society, which is always understood in terms of health and wellbeing of people, pigs and gardens. Thus the purpose of rituals, which are associated with this corpus of myths, is to stabilize the present life of society by focusing on particular threats to the status quo (Zöllner 1977:65-84). The central religious rite was known as Morofi; and the central healing ritual was called Kaliy.

Another myth, while not central in Yali religion, is worth mentioning here because it is held in common with other members of the greater Dani family, and because it explains the loss of the pristine condition and also gives rise to the expectation or the possibility of the recovery of that state. This is the mythical 'race' between a snake and a bird. The southern Yali version narrates how in primal times, before death was known, the message of rejuvenation was to be delivered to mankind by the snake (kaliy). The message was simply: Nabelai-habelai ('my outer skin your outer skin') which would be valid and effective when pronounced by the snake in the hearing of man. However, the snake, forced to proceed on its belly along the ground around rocks and trees, was overtaken by the pied chat (sebuto) 17 who flew directly through the air and called out his cry of mourning, Fongi Fongi (a mourning sound). One of the recently composed Yali hymns alludes to this myth, reinterpreting it:

The message of Nabelai-habelai, even while it was with us,
The message of Nahamut-hahamut (outer skin) even while it was in our hearts,
We would have taken Nabelai-habelai for ourselves.
But since Adam and Eve did wrong (we didn't), we would have taken Nahamut-hahamut for ourselves.
But since Adam and Eve did wrong (we didn't).

The hymn comes on to claim that the message of nabelai/habelai came through the message of Jesus, and that those who receive His message will go to heaven, implying that nabelai/habelai will be realized there. This shows that the Yali believe that prior to the intended arrival of the snake, nabelai/habelai was destined to be their experience, and that the bringing of the message was to effectuate it. But the untimely coming of the bird was the disruptive element which effectively denied them this blessing, and explains the presence of death in the present time. Thus this myth exemplifies the underlying concept that the present state is not as was experienced in the pristine age, and the lingering hope of the recovery or the realization of such ideal conditions.

3.3 Social organization

3.3.1. Moieties

Myth also explains the structure of society. A dualistic feature, which explains the origin and existence of the exogamous moieties and their associated clans, recurs in several myths (Zöllner 1980): There are two marsupials Hout and Hwesai, or the two primordial ancestors which they represent, Siringon and Samahun, who shoot the Yeli animal; or there are a woman and her son - the woman orders the son to shoot and kill her, which he does and she becomes a pig. In another version, the woman tells her son to look behind the hut, where he sees a big sow which he shoots. The son then butchers and cooks the pig and puts the different parts into two separate piles. In the morning he awakes to find that these have turned into people.

Each of these myths, and others, support the exogamous moiety principle and explain the origin of the different clans. Sexual intercourse between members of the same moiety is called bati and is the worst transgression known to the Yali. But bati is also used for any sacrilegious act, for example, trespass of a non-initiate (kublih) inside the yard of a sacred hut (pusa-huk) or into the hut itself, or the disclosure of sacred knowledge (lusi-huk), secret names (lulumi), or formulae (hwalu) in the hearing of non-initiates 14.

Any such act endangers cosmic stability, and therefore poses a serious threat to the welfare of Yali society. This might be manifest by sickness or infertility of people, pigs and gardens, and by unusually inclement weather, landslides or devastating earthquakes. Through the imposition of the severest sanctions the occurrence of these has been remarkably infrequent, and whenever, perchance, such has occurred, or is alleged to have occurred, ritual action has been taken to restore the status quo, to stabilize the Yali cosmos. From this it is evident that the established structure of Yali society is part of the structure of the "biocosmos" which must be preserved at all costs.

3.3.2. Kinship system

Within the named moieties Kolek and Bebehbal and their associated clans or sibs, which comprise Yali society, a complex Omaha type kinship system exists (Koch 1980:233-279). Typical of a Melanesian society, this system prescribes how people live and interact with one another in respect of such matters as marriage, death, rites of passage, land tenure, conflict settlement, and so forth. Yali kinship revolves around four groups or sets of relationships, and members of each group are bound to fulfill any obligations implicit in that set of relationships. Patrilineal relatives (or and erakw) form the first grouping, tend to reside patricratically, and male members belong to the same men's house (yous). The men are expected to be loyal
to each other and to assist one another in house building and land clearance for, and the making of, gardens; to defend members involved in conflict; and to avenge the deaths of others in conflict or reprisal. Mother’s patrilineal relatives (amosi and amamosi) comprise the second set, the significance of which is that it acknowledges the relationship of a child to the mother’s clan and the role the mother plays in giving birth to and raising children. The importance of mother’s brother, particularly in transitional ties, is reflected in the mirror relationship of the third set, sister’s children, who are non-cognatically distinguished from one’s own children (omalki). The fourth set comprises the maternal relatives through either wife or sister (ombankiti). Husbands are obligated to provide pigs regularly for their wives’ brothers.

Relations are therefore maintained through reciprocity: that is by helping and being helped, by giving and receiving of both goods (usually pigs) and physical assistance—both formally (in ritual events) and informally - in a process that might continue over a long time, and indeed in some particular aspects, over a lifetime. Reciprocity may be positive or negative, and since a person is expected to assist his kin in relation to other people, he may become implicated in a process of negative reciprocity towards those outside his immediate community. Kinship relationships are the building blocks of Yali society, then reciprocity is the mortar which binds each member together (Koch 1967:48-51; Macdonald 1964:216-218; Koch 1968).

3.3.3. Leadership

Yali social organization, as is basically typical of New Guinea highlands societies, can be described as egalitarian and unstratified (Koch 1967:53; cf Whitman 1983:58). Hence, leadership in Yali society is not clearly defined. In fact, both Kozh and Zollner state quite categorically that the New Guinea Big Man phenomenon reported for other highland societies, where a local group leader achieves his political status by personal power, is absent in Yali society (see Koch 1967:53; cf Whitman 1983:58). However, both acknowledge the existence of those whom the Yali of Yalimo designate as ap souon ‘big men’. These are men who are able to assume an influential position within a fairly restricted locality because of their identifiable characteristics: “Physical fitness, oratorical skill and assertiveness, and clever manipulation of pig exchanges” (Koch 1967:54).

This description is applicable to such leaders among the southern Yali, but the term ap hornu (the equivalent of ap souon) is not used in this way. Instead, the term ap nenene unuk bogdey ‘the man our-old-elder brother of the-supported-name’ is applied to those who have the three characteristics listed above.

The southern Yali recognize several additional characteristics of the leader:

- he is a man of his word—that is, his oratory can be backed by his actions and wealth;
- he is a man of self-control—not easily swayed by others, nor reacting to hostility;
- he is not a thief—in other words, he is not a likely source of social trouble through ordinary theft (yohol angge wauk), pig theft (wam uwan angge wauk), or wife-stealing (homi balduk).

His influence of sphere might extend to two or three villages, but normally was restricted to his own locality. His duties are directed for the common welfare, in such matters as pig keeping, not gardening and conflict. More recently, the term ap nenene unuk bogdey has ceased to be used in the traditional way, though the same characteristics are recognized by both government appointed local officials, for church leaders, but the Yali always insist that ap hwoton were far more important than ap unuk bogdey. This opinion is sustained by Zollner’s description of Yali religion, which emphasizes the centrality of the primary selam healing ritual and the significant role of medicine men (Zollner 1967:213-258). Yali religion is concerned with the whole of life, man in his cosmos, whether he be in relationship to ancestors or to kin; whether he be within the non-empirical or the empirical environment. Ap hwoton were therefore functioning at the heart of Yali life.

4. History of Contact

It is not known precisely when the Yali, as they are known today, had their first contact with the ‘outside world’ beyond their ‘Hupla’, western, and ‘Yali’, eastern neighbours. For the southern Yali, the earliest known contact occurred when members of an expedition, using a floatplane, landed on the Balim river just south of the mountains, and then proceeded up a mountain spur which separates the Seng and the Balim rivers. Their journey brought them near the village of Uwam, where some of the middle-aged and older men vividly remember the encounter. One of my informants, a man named Belu, who was a small boy of six or seven at the time, remembers that the other kinismen, dressed in western clothing by the expedition members, who indicated by the third person that they were going to take him as a servant. Nothing further untoward resulted from that expedition, but an enamelled metal cooking pot and some steel knives were left behind. I have been unable to determine with certainty when, or which expedition, this was, but further research has placed it as 1957. In May of that year, Donner and Fokker floatplanes landed for gold in the upper reaches of the Lorenz, Brazza and Dilig rivers. Since the Brazza and Lorentz rivers flow south to the east and west of the Balim river, and thus bracket the area in question, it is quite likely that it was members of this expedition who were the first outsiders to enter Yali territory 10.

Whether the above date is correct or not, it was about this time, and into the period of World War II, that the Yali began to see aeroplanes flying overhead or nearby. The airmen filled the Yali with trepidation and presentiment as to what such an event might forebode. The only concept to which they could relate it was the Yali, which, according to myth, had flown through the air making a bururu noise such as was made by the aircraft. This evoked the disruptive activity of the primordial period, the earthquakes, which had to be stabilized by the shooting or fealing of Yali. Throughout the area, therefore, rituals which recalled and realized that stabilization were performed by the ap hwoton. One informant who would have been quite a small child at the time, said that his mother pushed him into a hut and hid him with a kou bark cooking cylinder, and then in the evening, brushed him all over with the feathers of a konggou ‘frogmouth’ (a kind of nightbird like a nightjar), in order to ward off any sickness that might have been brought by the flying spirit.

Another possible early contact is one widely recounted and sung about by the Yali. This story originated not too far from Uwam, scene of the encounter mentioned above. When an expedition of white men arrived, wounding bush knives (fuh) and steel axes (melah) with which they could easily cut down saplings and fell trees, the Yali begged to be given some, but the expedition members refused.

A man called Yelbiuk therefore organized and led a massacre of the white men, and the Yali took the knives and axes for themselves. The song about Yelbiuk mentions Fiskurak, a place near Uwam, but my informant insisted that the accident occurred in an area a little south-west of the region presently occupied by the Yali, where a different language is spoken. Thus this account is not verifiable, but it is nevertheless indicative of early contact with white people and of the discovery to the Yali of a new dimension to the known cosmos.

Apart from some trade for salt in the Balim valley near Kurima, the Yali of the Heluk valley had no contact with the outside world until 1951 when Stanley Dale and Bruce Macdonald of an Australian Missionary Union trekked in from Heltigia via the Mugwi valley. They arrived in the northern Heluk, and set up camp on a sloping plateau known as Yabiongga, between the villages of Yali and Balinggama, which at that time were involved in hostilities (Manning 1969:25-26; Dale 1965:11-12) 12. In some way, through Western Dani porters and by sign language, Dale was able to communicate his desire that the warring Yali should make peace. It was taken by the Yali as a command, and a traditional peace ceremony (dog belupuk, ‘to set down the war arrow’) ensued on May 23, 1961, with the exchange of peace settlement pigs (ap gaban gowro), ‘kidney pigs’ (Manning 1969:28; Richardson 1977:145-148).

From Yabiongga Dale and de Leeuw moved to a ridge called Yerino, not far from the sacred Kwatu hill at Ninia, and began to construct an airstrip with sporadic and reluctant help from the Yali. When the airstrip was opened in March 1962, the name Ninia was used for identification, probably as having wider application than Yerino. Dale was joined soon after by that his wife and family, and set about learning and analysing the language with a view to preaching. The southern Yali began to experience increasing encounter with other peoples and other viewpoints, that were to bring about far reaching effects in Yali society. The peace that was established in the northern Heluk in May 1961 was never to be broken, and within relatively few years had gradually developed in both meaning and extent throughout the whole southern Yali territory.
5.0 THE ORALITY OF THE YALI

5.1 The Yali Language

One of the aspects of highland cultures in Irian Jaya, which is noticeable even to the casual observer, is the almost total absence of decorative, non-utilitarian crafts or arts. There is very little carving or painting, for example, and what little does exist usually is functional, such as the carving of bows on arrow heads, or symbolic, such as the designs on the wall-boards of Yali sacred huts (bubadem). In the Yali case, any activity which had no utilitarian or ritual function. On the other hand, the most highly regarded amongst the Yali is both evident and highly esteemed: there is a wealth of oral tradition; oratological skill is highly respected; the suahap 'verbal dispute' is an accepted form of conflict management; and linguistic awareness and bilingualism are not uncommon. Furthermore, contrary to the popular assumption by some people in so-called developed countries that the 'primitive' languages of primal peoples are simple and of limited vocabulary, the Yali of Irian Jaya have a highly ordered grammar and an extensive vocabulary capable of application in any and every situation and activity of everyday life.

The Yali verb system comprises ten classes of regular verbs and three irregular verbs conjugated in six time-person forms which consist of a verb stem denoting the action and a suffix denoting time and person. The time aspects are: the remote past, beyond the lifetime of the present generation; the past, prior to yesterday; the recent past, from night till the moment of speaking (when it may be used factitiously of an event about to happen or already happening); the present or habitual; the near future, from the moment of speaking till night; and the future, from the moment of speaking till tomorrow. There are numerous other forms of verb, compound forms of verbs, which encompass a wide range of possible activities. For example, there are a subject, a six person immediate imperative; a delayed imperative; a reflexive; a completed action; a repeated action; an action in conjunction with verbs of motion; a serial action; and other forms. Some of the verbs must also carry prefixes and infixes for indirect objects, so that what translates as a complete English sentence can be conveyed in a single, one-word verb. Where in English one verb covers a wide field of meaning, there might be two or more in Yali which differentiate contrastive or distinctive characteristics of the same or similar actions. Conjunctions function as more than connectives, since they also indicate whether the same or a different subject is responsible for the action of the succeeding verb, and in addition, considerable nuances and other grammatical particles contribute to the pattern of discourse structure, denoting subjects and topics, and providing other information that signpost the oral text for the listeners. There is no indirect discourse, only direct; therefore each speaker and participant must be clearly marked, and transitions from one speaker to another are always distinctly indicated by the syntactic form.

Another interesting feature of Yali discourse is that it is always from the perspective of the speaker. This is reflected in the fact that the Yali language has a plethora of directional words - nouns, adjectives, adverbs and verbs - which relate to the nature of the terrain, rather than cardinal points as we know them. In addition to the general directions, up-valley and down-valley (which in effect are north and south, since the main river systems flow south from the central ranges), and Yali filli (in the direction of the 'Yali that is, east) and Hupia filli (in the direction of the Hupia), there are directional words which refer to directions and relative positions up and down the slopes of the valley sides, along the contours of the valley sides, across the valley or re-entrant ravine, and beyond the mountain or horizon. Even when relating a story that originates from another location, such directional terms are necessary in order for listeners to conceptualize the locations and movements of the narrative.

The Yali preoccupation with speech and the efficacy of words (even if generally, though not always, subconscious) is manifest to some degree by the number and variety of terms that are used to describe oral activities. The word eile 'speech' is used for any sound that is actively or consciously produced whether by human, animal or inanimate object, which in some way characterizes the source of the sound, and is differentiated from aploko 'noise' that results from passive or unconscious movement such as the rustling of leaves in the wind or the crashing of rocks in a landslide (Ong 1962:32). Another term associated with speech is the word 'utterance' where the field of meaning encompasses 'message', 'information', 'story', 'words' and 'social problem', such as in the expressions bilingguruk 'to relate/recount a
5.2.2 Poetry

In line with Vansina’s typology, I include here all categories of Yali songs as being oral texts of fixed form, of which both the form and content are recognised by the Yali as having artistic merit. In other words, all Yali poetry exists as songs. The Yali love to sing and have an abundance of songs ‘ancient and modern’, and as Koch observed ‘an admirable talent for instant composition of new lyrics to go with their old tunes’ (Koch 1974:15). While some songs are sung only by specific people or in ritual contexts, a vast number of songs are composed by both men and women, and are sung without restriction.

In Vansina’s sub-category of historical poetry are a number of songs which recall or recount events from the past such as the ‘Guru’ composed following Yaliaku’s attack on the exploratory expedition in the foothills of the southern extremity of Yali territory. A large, probably the largest, body of songs is associated with war and revenge killings and recounts or alludes to famous incidents:

Songs heard at every dance keep alive memories of battles and ambush killings. Many stories are cast into a traditional syntactic frame, often changing only the names of people and place to describe similar events that occurred in different wars. The verse assail the violent acts of one’s own side and drive the enemy’s recollection and humiliating defeats (Koch 1974:85).

Many such songs were sung in the context of dancing (yungguliuk), which sometimes formed part of a cycle of reciprocity between allied villages. For example, the person or persons responsible for initiating a revenge killing - dog andonghalem or ‘those at the source of the war arrow’ - would sing for their allies, kino-kino assuri, expressing desire for a revenge killing from among their mutual enemies, eneseluao. After a successful killing, those who had executed the revenge might be asked to come and collect a pig in payment. On the way to collect the pig and on arrival in the village of the dog andonghalem on, songs about war or even about the recent success (wat esauk kwit suni’song about killing them), were sung by the victors. If it was felt that one pig was not sufficient payment a song asking for additional pig payments (henggili suni ‘request song’) was sung as they danced. The hosts would respond and after a satisfactory conclusion would send their victorious allies home with their pigs by singing monce feseruk suni ‘valedictory songs’. As part of the oral tradition of the Yali, these dance songs (yunguli suni) help preserve their knowledge of past events in the local history (Koch 1980:86).

Similarly, there were a number of peace songs (wai or yeiti suni) which were sung in a responsive manner by members of each village, as the party seeking peace drew near to an appointed place to make their overtures prior to formal peace settlement (Zölner 1988:291, 6:7, 213-295 and 548-641).

Apparently, the group fearing a revenge killing usually makes a formal peace offer. Group members perform a dance within shouting distance of the enemy village and sing a series of traditional peace songs. These songs beseech the loss of men and pigs and express regret over the cessation of trade between the two sides, and they often blame a third group or a particular man for the hostilities (Koch 1974:263).

Still largely associated with war and also frequently sung in the context of the dance cycle, were a number of panegyric songs extolling the skills of outstanding warriors or war leaders, who led their company out in successful warfare and brought them back without loss of life. Such songs were called apei wauk or morekek suni ‘(praise) songs’.

Within the scope of Vansina’s third category of poetry - religious songs - there are a number of esoteric songs and hwal formule sung only by the ap hwal medicine men. The songs recall the central myths and the formule are simply a variety of the spoken hwal recitations used in healing rituals. This accords with what Vansina wrote:

The characteristic feature of this kind of poetry is the care which is taken to ensure that it is transmitted accurately, together with the fact that it usually belongs to an esoteric tradition. Another fact worth noting is that this is a form of literature produced by a class of specialists - the ministers of religion in question (Vansina 1973:107).

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Personal poetry - Vansina’s fourth category of poetry - is one where the Yali delight in song, and ready aptitude for composition gives scope for a wide variety of texts in which individuals or groups can express their feelings and attitudes to life. For example, the susah/altercations, which usually occur in the late afternoon, when people return from their gardens or the forest, might result in the composition of a song of complaint sung in the men’s hut in the evening. The content of the earlier susah is usually toned down by circumlocutory or cryptic allusions (heweraho were), but they ‘communicate a grievance in a way that obviates the necessity of a face-to-face confrontation’. Koch makes this interesting observation:

Since the texts and tunes conform to traditional stanzas and compositions, to sing them together with other well-known songs subdues their potentially offensive content even more, especially because some verses change only the names of localities, which then alone give the clues to their interpretation(Koch 1983).

In a similar way, when someone dies, people quickly compose or modify existing laemets (obe suni), and mothers will comfort their children with known or spontaneous lullabies (malik ngonggonduk suni, ‘songs to comfort the child’).

Another group of songs that can be classified as personal poetry are the kelem songs which are sung in responsive fashion by groups of boys and girls during dancing. These songs aim at enticing the girls whom the young men desire, and vice versa, but their invitations and hopeful overtures are often marred by verses conveying scorn and contempt, couched in periphrastic or cryptic language. An interesting application of this was made in the translation of Luke 7:32, where the children are playing singing-games and call out:

We sang kelem songs to you, but you did not respond with kelem songs to us. We sang laments for you, but you are not crying.

The use of songs in this quotation gives insight into a prominent feature of Yali song. Apart from the esoteric songs restricted to use by hwalon medicine men, songs of all types are sung by men and women, and boys and girls in all places and on all kinds of occasions: in the huts at night, at work, on the trail and at play. There seems to be no limit to the variety of song, nor restriction on composition, or by whom they may be sung.

5.2.3 Lits

As mentioned above, the only lists which the Yali use are the lists of esoteric luhuram names used by the medicine men. I have not discovered any other kind of list or genealogy.

5.2.4 Tales

The Yali are not lacking a variety of narrative texts, which conform to Vansina’s fourth type of oral tradition, though at first sight one might be distracted by the number of terms. The fact is the Yali do not seem to differentiate between the three types of history or personal recollections which Vansina outlines, all of which are covered by dindil ale (‘tales’ - the verb dindiluk means ‘to relate’ or ‘recount’), but which are also recognised as debeg ale (‘what people did in the remote past), duswa ale (‘what people have done in the ordinary past), and duruk ale (‘what people do habitually’). Dindil ale tales are always reckoned to be true stories of real life experience, which originally may have been first hand, but are taken and repeated as hearsay to others. Vansina contrasts such free form narrative with poetry:

The very words of a poem belong to tradition, whereas in the case of a narrative, they are a contribution made by the narrator, and only the general outline of the narrative belongs to the tradition. Nevertheless, a testimony consists of words spoken by the informant, whether it be a narrative or a poem (Vansina 1973:23).
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The tradition is thus interpreted through the personality of the teller of the tale - each teller contributes a touch of his own, and since each person hears according to context and his own perspective, each new narrator interprets or connotes some aspects of the text.

As mentioned above, the Yall have two kinds of myth, both of which are included in the southern Yall term wene mulik 'ancestral stories' or its alternative wene hebeg (the stories/messages they placed in the remote past). As Zöllner observed, the two categories of Yall myth are largely differentiated by secrecy, thus those that are oosa ("sacred" or "taboo") are restricted, while others are freely passed on informally by men to their children. In fact, some of these are the instructive lore that is expected to be passed on to all one's children - whether male or female - and some are the astrological myths which account for natural phenomena; why the cassowary cannot fly, where fire came from, why men have beards, and so forth. The oosa category included the origin myths which were passed on formally to men in the various translation rites.

Into Vansina's category of 'tales with artistic merit' - the object of which is to please and entertain the listener(s) - fall the nunung 'fairly tales'. These are imaginary stories (wenggel-hebeg wene) created and passed on by both men and women, to while away the evening hours, by the firelight in the huts, or perhaps, in dry weather, around a fire in the open air. The nunung stories are about imaginary people and strange beings, such as people with wings and people who visit spirits; they are about love, sorrow and adventure.

Children and young people soon learn who are the good story tellers and ask - as they do all over the world - 'Tell us a story!' (Nunung yaq-nemashin - literally, 'plant for us a nunung'). The story teller begins with the formula, 'Do you know the one about...?' (using a key phrase such as, "...the man who broke his leg"). It may be that some already know the story, but like it so well they invite the narrator to tell it anyway. Sometimes a visitor, who is a good story teller, will be invited to 'plant a nunung'. The nunung is always told using the recent past (today's past) tense, which enhances the immediacy and excitement of the story. A good story teller knows how to spin his tale, and in the firelight the expressions on his face and the movements of his hands contribute to the narration. It is impossible to emphasize how the narrator or to add to his story, but it is quite in order to ask questions, exclaim, or laugh as appropriate. As the tale concludes, the narrator closes with, "Nunung-nunung, derag-dereg," (which cannot be translated, but can be glossed "so ends my story."); The listeners thank the story teller, and if the night is young - and even if it is not - if their appetite has been whetted, they ask for more.

Nunung stories were learned and memorized from the repeated telling by the best story tellers, who were those skilled at composition, wenggel-hebeg hweag-esuk (to tell them while thinking to oneself), or who could take a good story and improve it by embellishment (dopnoronuk - 'to add on to'). There might also be a moral or application drawn for the young listeners: 'how don't you be like that or the same thing might happen to you'. For some of the nunung, songs were composed which might be sung during or at the end of the tale, and thereby serve as a mnemonic for the story. Traditionally, men told nunung stories to boys and men only in the yoss, and women told them to the girls and women in the homie; but there was at least one renowned woman story teller called Binisig whose tales drew men and boys to listen to her when she told them out of doors by firelight on a dry night.

As there are no Yall commentaries according to Vansina's fifth type, this concludes my synopsis of the categories of oral tradition for the southern Yall. Of oral texts open to general public transmission, the numerous songs used during yungguluk dancing or on other occasions, and the popular nunung tales, told of an evening, comprise an extensive oral tradition, which has not been lost or discarded through the introduction of Christianity or literacy, and which are media of considerable import for the communication of Scripture and the internalization of Christianity in Yall culture.

Endnotes

1 Part of an extract from a dissertation presented to the Faculty of Divinity of the University of Edinburgh in partial fulfillment of the requirement for the degree of Master of Theology 1968.
2 John Wilson has been working under the auspices of the Regions Beyond Missionary Union since 1971.
3 Some huts also accommodate pigs and have an internal partitioned pen with an additional pig door.
4 Felling a hardwood sahlu tree necessary for durable wall boards would consume a full day when using the stone adze.
5 There are two types of bow: those made from a mountain tree called auon and those made from a palm called sugnirm available in lower, warmer areas. The latter, highly prized, requires a lot of careful preparation.
6 There are four kinds of arrow: arrows for hunting people (dog); arrows for hunting pig (minggin); arrows for hunting animals (foun); and arrows for hunting birds (klop).
7 The hours of sunrise and sunset vary little at this latitude from approximate 5:30 am to 6:00pm.
8 In the Holuwon area in 1986, there was widespread occurrence of a sweet potato blight at altitudes below 1500 meters. A similar blight reportedly occurred in 1966/67.
9 A third element, the Kwatu transition rite, (of western origin) exists for some of the souther Yall, but all Yall acknowledge these two strands from the east as essential and central to Yall religion.
10 Informants who tell this version of the Yall myth say that the tree/pillar versions are cryptic representation of the true (i.e. their) account. Acne blows to each side of the tree/pillar are, in fact, the arrows shot into each side of the animal by the two primal ancestors of the two ecumonic moieties.
11 In Yall, ap means "man" or "people"; hwaion consists of hwa' from the stem of the verb "to take care of" or "to keep in order", and on, a nominalizing suffix which can be glossed "type/kind". In an article in IRIAN XV (1986/3-13), I inadvertently glossed ap hwaion as 'shaman'. 'Caretaker' might be an etymologically more appropriate gloss, but Zöllner's use of 'medicine man' is quite apt though ap hwaion did not generally use medicine per se in their healing rites.
12 Abelis is the outer skin shed by various reptiles. This ability symbolizes continuous rejuvenation, perhaps even 'eternal life'.
13 The pieed chat (vebelu) has white should patches which are compared to the mud which people daub on their bodies when mourning. It is possibly similar to Blyth's hombill (sibine).
14 Richardson (1977:60-66) cites verifiable examples for each of these: Klokho was execrated for alleged incest with his daughter; Nindig-ameng was cast into the river Heluk when she unwittingly trespassed in the yard of the Kwatu sacred hut at Nin; and Bugini was hacked to death with a stone adze when he went berserk, calling out sacred luham rentals in the hearing of women and children.
15 Most accounts of the various expeditions are in Dutch, and I am indebted to Drs. Jan A. Godschalk for the information on the 1937 expedition.
16 These were the terms coined then, which have since been replaced by karog "bush knife" (from the verb 'to slash') and Bosie "steel axe" (a corruption of the western Dani mbut, from Indonesian besi "steel").
17 At about the same time Gerrit Kuit of the Netherlands Reformed Congregation entered Pass Valley (Abenaho), Siegfried Zöllner of Rheinisches Missions Gessellschaft, and Dr. Friend of Nederlands Hervormde Kerk entered the Yahuli valley to base themselves at Angguruk. 
18 This information is drawn from my unpublished papers on the Yall language, and compares with what has been reported by Zöllner for Angguruk and Fahner for Pass Valley dialects of yall. How-
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over, southern Yali differs from the other two dialects in that the remote past only has a third person form, since it is always used of events outside the lifetime of the speaker or his peers, whereas in Angguruk, for example, it is used for events as recent as ten years ago. This difference in tense usage, and also the directional terms are significant for bible translation.

19 Very rarely is it applied to mean "word", and in fact, I suspect such usage is rare, all aware of word breaks in speech, whereas traditionally the term unuk 'name' would be used for a specific expression, or else an individual expression could be identified in a verbal phrase, "We say...".

Some other important expressions are: ene me tu to sharpen their speech (converse or discuss); sao me tu to lie who want a lot; su sa me tu to have a verbal altercation; sun unuk to sing; dindid du to recount a story or event; nunung yek to plant a nunung (i.e. to tell a fairy tale).

21 The Yali term for these fairy tales in Yalimu is aulit; but in southern Yali they are known as nunung.

22 A description of Vansina's categories are included in the full version of the thesis.

23 I have described this in Wilson 1986:8-10.


25 N.B. in Zöllner's careful study of Yali religion, he has recorded a large number of fwal formulae and what he calls "healing song" (Zöllner 1977).

A Yali house.

All drawings are by A.C. Wood.

Pigs are very important to the Yali.

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Yali man playing a mouth harp.

Yali man smoking.
0. Introduction

This paper describes the Sago Grub Festival as practiced by the Kombai people who inhabit the southern swamplands of Irian Jaya. The Sago Grub Festival is the most important festival of the Kombai people. The Sago Grub Festival is the instrument for controlling the life of the people according to the custom of their ancestors. They carefully guard their culture from disturbances or dangers by performing the rituals and ceremonies of this festival. It is a fertility festival that not only celebrates the abundance of sago and the sago grub, but also ensures the continuance of the life of the Kombai people. It is a festival that restores any imbalance in their life and brings back a peaceful and harmonious state. It is a celebration that relates the spirit world to the human world and nature to other people.

1. The Kombai

1.1 Location

The Kombai people live on the south coast of Irian Jaya, which is mostly swampland. The Digul, Elaianden and Ndeiram Rivers form the borders. Several different groups of people live in this area, distinguished by different languages and cultures. These are the Awyu, Citak, Jair, Kombai, Korowal, Mandobo, Sait, Tsakawombo, Wambom, and Wanggop people. The boundaries of the Kombai people are the Digul and Kasauri River in the east, the Ndeiram Kabur on the north and west. They live along the Kouth, Manggon, Ndeiram Hitam, and Murup/Kasauri Rivers. (See map).

The Kombai consist of the following clans who live in separate geographic areas: Baymanop (at the center of the Kombai district), Khothowunata (people from the Kouh river and Weremba family), Ali (Manggon river), Rayano, Renggalea, Marano, Nombika and Tayan (in the middle of Ndeiram Kabur and Ndeiram Hitam, from the top to the bottom). The clans who live near the borders are close to their neighboring clans such as the Khothowunata with the Jair, the Tayan with the Citak, the Nombika and the Renggalea or the Ringgakholufo with the Korowal.

All these groups except for the Mandobo and Wambom celebrate the Sago Grub Festival. The preparations and rituals of the Citak and the Tsakawombo are quite distinct from that of the Kombai and Korowal (see Appendix 2 & 3). The Mandobo and Wambon celebrate a pig festival which has similar functions to the Sago Grub Festival. The Jair, Awyu, and Sait have a pig festival which is their important festival besides a Sago Grub Festival.
1.2 Description and life style

Most of the Kombai live in tree houses hidden in jungle banana gardens or sago swamps. They are an isolated people. They are physically small in stature and keep to themselves. They are influenced little by the outside world. Associations with other families is through marriage or trade.

The Kombai are hunters and gatherers, sago being their staple food. They plant only a few crops such as bananas, sweet potato, and sugar cane. It is sago and the sago grub that constitute the basis of their lives.

1.3 World view

The Kombai world consists of the world above, mankind and nature. Various spirits and ghosts live in the world above, but come and bother mankind and nature.

Their main spirit or god is Refatu. He lives in the ancestral territory of Arimbor on the Murup River. However, he sleeps most of the time at the top of a hill there. He is the guardian of their culture and it is his duty to see that the people follow the traditions of their ancestors. When the people violate a taboo or tradition, Refatu gets angry and brings disaster such as floods, earthquakes, sickness, and death. Refatu needs to be appeased by offering sacrifices, and performing rituals and ceremonies. By appeasing Refatu and performing the proper rituals, the Kombai people guarantee the continuance of their life.

For the Kombai, mankind is divided into two groups—the extended family members and outsiders. These include people from the same group who are not closely related as well as people from any of the surrounding groups mentioned in section 1.1. These outsiders are not seen as 'people'. Their definition of outsiders can also include a foreigner in this classification. The people consider this group enemies so when they attend a Sago Grub Festival, they are watched constantly. They are asked not to stir up animosities, but whether he behaves as a good guest or not depends on the person himself or on his acceptance by the extended family giving family.

Nature is the physical world and all the things in it. Prosperity in this area depends on the interacting of the other two aspects. If man has not broken a taboo the spirits will not be angry and cause a natural disaster. They consider floods, famine, disease, a solar eclipse, death, etc. the result of an imbalance of relations between man and the spirit world.

The most important item in nature is sago. An overabundance of sago causes an imbalance in nature. Therefore, man needs to hold a festival to take care of this overabundance. They consider sago to be the source of life. Without sago there would be no life. Therefore the Sago Grub festival is the most important of all festivals because it guarantees life and its continuance. Sago is like a mother. The mother (sago) gives birth to a child (the sago grub). Without the sago (mother), there is no sago grub (the child).

2.0 Purposes of the Sago Grub Festival

The abundance of sago provides the opportunity for a Sago Grub Festival. However, the purpose for the Sago Grub Festival is to guarantee the balancing of all aspects of life that need to be balanced. This includes the three aspects of the Kombai world—mankind, nature and the spirit world. The festival is held in order to precede or succeed an imbalance that has occurred in any aspect of their lives. When the people have followed tribal laws and customs and have not violated any taboos, there is harmony. When violations have occurred, they must perform a ritual ceremony (sacrifice), the balance returns.

The Sago Grub Festival concentrates on the family who hosts the festival. In this way, the family acts as the hub that controls the wheel of life. They restore the imbalance in relations between people, between the spirits, people and nature. The wheel diagram depicts this relationship.

By giving a Sago Grub Festival, the giver, along with his family, receive prestige and honor from other families. In hosting the festival, the family restores the imbalance and provides the continuance of the Kombai culture. Therefore, if a family has a sufficient amount of sago, he may want to challenge another by hosting a bigger party. When this happens it is called a season of festivals.

Some occurrences of imbalance in the relationship between mankind, nature, and the spirit world are:

- an imbalance between all groups

Example of this are flooding rains, and lack of food resulting in famine, an earthquake, a solar eclipse, etc. This means that Refatu or another spirit needs to be appeased.

- an imbalance between people (relatives versus others)

This imbalance occurs when people are angry with one another and there are war, killings, or enemy threats.

- an imbalance between people in a family group
1. One of the most frequent imbalance within a family group are quarrels or disagreements over such things as bride payment.

2. Lack of reciprocation causes an imbalance between people in a family group also. Certain situations need reciprocation. These can occur when an older brother has fulfilled a request of a village elder, an orphan reciprocates his adopted parents, a young man reciprocates an uncle who put on his gourd in the rite of initiation, a man reciprocates another Sago Grub Festival, good crops, success in a community or family enterprise, etc.

   Any man who realizes that there is an imbalance in one or more aspects of the life of his people can host a Sago Grub Festival. However, if he is a young man, he must get permission or approval from an older man.

   The guardian of the fire sees that the performance of the ceremonies appeases the spirits. He invites many guests to come to the ceremony and serves abundant food and provides an opportunity for social interchange so that the imbalance in relationships can be restored. They conduct many arrangements such as weddings or war raids. There is much happy dancing. Each part of the festival is very important in restoring the balance of relationships.

3. Description of the Sago Grub Festival

   The Sago Grub Festival covers the period of time of preparation (6-8 weeks) and the actual festivities. There are five main rituals associated with the festival—three occur during the preparation stage, one during the actual festivities, and one following the close of the festival after the guests have returned to their homes.

   The preparation time also covers the time of the growth of the sago grub. During this time, a man is appointed as guardian of the fire which symbolizes the growth of the grub. Certain trees are chopped down and left to rot so that the grub can grow inside the tree. The grub is the larva of the beetles grub bound in sago trees. When the larvae get ready to spin their cocoons, their activity increases so that they make a humming noise. When the people hear this noise, they know that the larva is ready to be eaten. If they wait too long to collect them, they enter their cocoons and become beetles. If the people see the beetles flying around the sago trees, they know that they have waited too long.

3.1 Preparation for the Sago Grub Festival

   The preparation for the Sago Grub Festival includes several activities and three of the five rituals. The activities are the decision of the host to have the festival, the sending out of the invitations, the lighting of the fire, the construction of the ceremonial long house, chopping down the first sago tree for grubs, chopping down the trees for sago, preparation of the sacred rack to store the grubs and collection of firewood. The three rituals are chopping down the first sago tree, collecting the first sago grubs, and throwing out the extra leaves and vines.

3.1.1 The decision to hold the festival

   A man who decides to hold a Sago Grub Festival invites all the people of his family who have the 'right' to participate in the preparation of the festival. These people are the first invitees or family members. There are a limited number of men who can host a festival. These are the men who have been traditionally appointed as guardian of tribal land and whose rights passes down through consanguineal kinship lines. These men are also responsible for the welfare of the people. They in turn invite all the members of the respective families to attend the festival. The preparations aim at a time one to three months in the future for the festival. During this time, the members of the extended family stay with the host to help in the preparations.

3.1.2 The fire watcher/guardian (wambeno) of the fire

   The success of the festival is determined, in part, by a person called a wambeno or the guardian of the fire. This person is either the host of the festival himself or a person that he has selected from his family (such as an older brother or son). The only restriction is that it be a male. Sometimes it is a young boy who is close to an older brother or uncle.

   The duties of the wambeno are very important, as he represents the family to the gods for the duration of the festival. His main duty is to watch over the fire as a mediator with the spirit world. He also represents the sago grub. Whatever he does affects the growth of the sago grub. In watching the fire, he symbolically watches over the growth of the sago grub inside the sago tree.

   The first duty of the wambeno is to light the fire with rotan vine in the manner specified by their ancestors. To keep the fire from being extinguished, he uses hardwood or coal. The ashes cannot be spread but he saves them for the fireplace. Only the guardian can use the fire to cook his food. If he needs to attend another ceremony or do something else, he appoints another guardian to perform his duty for time he is gone.

   The wambeno lights the fire in a tree house or in another small hut if the men have not yet finished the ceremonial long house. When they complete the ceremonial house, the wambeno will move the fire there near the centerpole. They construct a fence around the pole and the fire creating a sacred area or room. Only the wambeno enters that room.

   The abundance of sago grubs depends on the continuous fire, the appeasement of the spirits that reside in the sacred pole, and the completion of the duties of the guardian of the fire.

   The wambeno also performs these rituals:
   - the planting of the sacred pole inside the ceremonial long house,
   - the chopping down of the first sago tree,
   - the gathering of the first grubs, and
   - the starting of the bere song.

   During his time of duty the wambeno has to perform everything with exact precision. If he, as representative of the whole family, violates a taboo, there will be no sago grubs. The host will be very angry, and the guests will be very hungry and will humble the host along with his family. Instead of gaining prestige and honor, he will be humiliated and create a much greater imbalance.

   Taboos for the wambeno:
   - He cannot eat fast moving animals such as iguana, snake, cassowary. He cannot eat turtle or fish without scales. Whenever he eats scaleless fish, the sago grub becomes like glue and disappears.
   - He cannot eat large amounts. Only a little sago, small fish, or shrimp can be eaten so that the grub will not eat too much and die.
   - He cannot eat the tops or ends of the sago or the hard outside. The grub only eats the soft sago inside the tree. His leftovers are not thrown away. The fish bones and shrimp shells are stuck in the roof above the fire.
He cannot drink water from the river, only the water found in sago leaves. He cannot bathe in the river, but he can wade in the water up to his knees or waist. When he is hot, he must pour water on his body. If he violates this taboo, a flooding rain will come and cover the swamp and the grub will be carried away in the current.

- He must walk slowly without making any noise so that the grub is not frightened and runs away.
- He cannot go far and can only use normal paths so that the grub does not get lost and disappear.
- He cannot have sexual relations with his wife nor can the wife visit him in the ceremonial house. If he violates this taboo, the grub will become hard, or the sago will become glue so that the grub dies.
- He cannot use items from the outside world such as matches, shorts, clothes, plates, cups, etc.

The wambone has to concentrate on his duty so that the preparation and celebration of the festival will be happy. Therefore he has to live in this special way. The success of the Sago Grub Festival depends upon this special person. Later when there are many sago grubs, he will be praised, but if there are not, his family will blame him.

Every head of the family or elder is responsible to take care of the wambone. They bring his food and take care of his needs lest the sago grub hunger and die.

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3.1.3 Making the ceremonial long house

After the host decides to have a Sago Grub Festival, the men begin with the construction of a ceremonial long house. They clear a place in the garden or swamp and indicate the place where the main poles of the house will be. The number of centerpoles equals the number of elders invited. The size of the ceremonial house correlates to the number of heads of families.

Among these centerpoles is the main centerpole in the middle of the house. They use a special tree—Endokane. It is a softwood that attracts the sago grub and its larva. The Kombai believe that this pole will attract beetles to lay eggs in the sago tree. This pole is planted by the guardian of the fire assisted by several elders.

The focal point of the festival is the centerpole. It represents the spirits. This is a sacred pole, as it forms the connection between man and the spirit world. Often the end of the pole sticks out through the roof of the house or they make a hole in the roof just next to the main centerpole. Through this hole the spirits are free to come and go.

The area around that centerpole is the sacred area. This area also contains the fire. The sacrifices for Retali are hung on the main centerpole. They store the firewood on the wall opposite the fire. Only the guardian of the fire can enter this area before the men remove the fence during the bere ceremony.

The area around the other poles is divided in men and women's areas. These are the areas where the guests stay when they want to sleep. One section is for the male guests and one for the female guests. The women's section is divided from the other by walls, having an entrance to the outside and into the main area. They use normal wood for the other poles. The construction takes several weeks to finish.

The completed ceremonial long house.

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The ceremonial house. The centerpoles are named according to each host family. The area around the main centerpole is a sacred area. The men and women have separate sleeping areas.
There is not a ritual as such during the construction of the ceremonial longhouse. However, during this time they prepare the sacred area for the rituals that will be conducted later.

They place several special leaves inside the hooles which are dug for the poles that make it look like a rat’s nest. He chants the phrase ‘Lik this we close the water hole.’

Another important part of the ceremonial longhouse is the two ends of the ridgepost where they hang leftover roots leaves and rotan vine. They look like the small voniya bird’s nest. The shape of the nest is like a bottle with the top having a small opening.

### 3.1.4. The ritual of chopping down the first sago tree.

On a certain day after they complete the ceremonial longhouse, the wambeno goes to the sago swamp to cut down the first sago tree. He takes with him the dibble stick and stone axe chosen especially for this ceremony. The other heads of families and their family members accompany him. They choose a young tree that does not have thorns. They stand in a ring around the foot of the tree while placing pig fat and bird feathers there. Then they burn this as a sacrificial offering to Refatu.

Then they sing these ritual words together:

Refatu, you who made the grass, receive this pig fat and bird feathers. Do not send sickness, death or the witchcraft "swengi" to us.
Do not allow the rain to fall on the people who are chopping down the sago tree.
Refatu, you who are young from the beginning and even until now, bring us peace.
Chase away the people who want to frustrate our plans or steal our grubs.
Watch over us so that nothing disturbs us.

The wambeno takes the dibble stick, blows on both ends of it (so that the grub will grow quickly), and cleans around the bottom of the tree.

Then he takes the stone axe and blows on both ends. He chops down the first sago tree and cuts off the sprout at the top. The tree is also split open from top to bottom. They cover the tree with sago leaves so that the pigs will not eat the sago from it and the sago grubs can grow in it.

While the guardian of the fire is chopping down and opening the sago tree, the others are singing and reciting the secret ritual:

Grub, grub,... (calling the grub to enter the sago tree).
Grub, grub,... Yellow grub. (A young grub is white, but a mature one is yellow.)
Let’s take out the waste and grub remains. (A sign that the grub will grow in the tree. If there is a grub waste, there will also be grubs.)
I want to smash the head of the grub.
He is ripe. (The sago tree is ripe.)
There are so many grubs we will take them. (Invoking grubs to become many.)
Mother grub. (Calling her to lay many larvae in the sago.)
Sago sprout. (The young leaves at the top of the sago tree mean that it will produce many grubs.)

The sprouts from the tree are taken off and divided among the participants. However, only those who have followed the regulations can eat from the sprouts.

After this ceremony the family heads return to their respective sago gardens and chop down many sago trees. The sago grubs that grow in these trees will be eaten at the festival.
Any person who did not keep the taboos cannot gather sago grubs. No one would try to hide a wrong doing because they are afraid of the consequences, Refatu, or one of the other spirits, would know and he would punish them by sickness, death, or lack of prosperity.

In this ritual, the wambeno gathers the first grubs. He takes the grubs from the first tree, and these are sacrificed to Refatu. The people recite:

The first sago grubs we give to Refatu.

On the first collection day, the people collect only a few grubs. What they do collect they place on the rib of a sago frond. They take some of the rotted sago from the tree so that the grubs can continue to live.

They hang one bundle of grubs on the centerpole in the middle of the ceremonial house along with a little sago and other food. The rest of the grubs are divided among the heads of the families that planted a centerpole in the ceremonial house. The grubs are wrapped in sago leaves and placed in a rack. They are not mixed with the grubs from other trees.

Some of the people gather grubs, and others dance in the ceremonial house. The people are very happy while they are collecting the grubs. They store the rest of the grubs on the storage racks. From time to time they are taken from the rack and shown to friends. Then they are wrapped up again and put back.

The following day the people gather in family groups. They confess their sins again and plant their sticks. Later the ones who have did not break a taboo, gather grubs.

It takes about three days to finish collecting the grubs. They bring thousands of grubs to the ceremonial house and store them on the racks. Everyone sings and dances, eats sago and grubs, and feels very happy. The women can help, but they can neither gather grubs nor place the grubs on the rack.

Next comes the examination of the amount of sago grubs. The sago grubs are taken off the rack and placed on top of a piece of wood. (If they place them on the ground, the spirits will come and steal them.) They examine the amount several times. Each group will have collected a different number of grubs. If a particular group has very little, they will be suspected of not confessing a wrong. After the examination, the grubs are wrapped in sago leaves. A special tool is used to tie the large bundles and another to tie the smaller bundles. After they tie the bundles, they are examined again.

They then put the bundles back on the racks one by one. As each head of the household places his bundle on his rack, he mentions the name of the guests he invites ("This bundle is for older brother, that one is for my in-laws").

3.1.7 Throwing out the extra leaves and vines

After the organization of the grubs, the preparation for the Sago Grub Festival is almost complete. But first comes the ritual of throwing out the extra leaves and vines leftover from the wrappings of the grubs. These are taken out of the ceremonial house in a special way. The people say,

Vine, roof leaves, wood, the extra we gather and throw out.
Cut, out, out.

While they sing, the people gather the extra leaves and vine and throw them out of the ceremonial house. The guests who are from nearby also participate in the wrapping of the grubs and throwing out of the extra leaves and vine. The important ritual also ensures the fertility of the sago tree so that it will quickly grow and flower.

Now the preparations are over. The festival site, the sago and grubs, the host along with his family, are ready to begin the celebration. That night the people dance and sing in the ceremonial house. They eat happily since they have honored Refatu and tomorrow the Sago Grub Festival begins.

3.2.1 The ritual of the bere song

On the morning of the festival when they perform the main ritual bere, the family members gather around the fence of the sacred area in the ceremonial house. They make obeisance to Refatu. The hole in the roof and the pole that sticks out symbolizes that Refatu is there.

The fence is there so no one will accidently bump against or touch the sacred centerpole. On this pole are hang a package of sago grubs, ripe bananas, reed vegetables, and sometimes the stone axe used by the guardian of the fire to cut down the first sago tree.

The stone axe is now rubbed with ashes from the sacred fire. The wambeno has faithfully watched over the fire. He has become thin because of the difficult nature of his job.

All the men including the young boys sit near the fence and all the women sit behind them. Some of the young women dance around the fence to the left or to the right. For each direction there is a separate step.

All the parents lift up their small children in the direction of the centerpole so that they will be blessed with health and growth and not get sick or die. They are asking Refatu to bless their children and watch over them.

At the set time the wambeno or a given woman starts to sing the bere song. If he does not know the song, another starts it. One starts the song and another follows. Then two men enter the sacred area and begin to sing and dance. The ceremony of the bere has begun.

The wambeno, or the two men who started dancing take hold of the sacred centerpole. They dance around it while singing. The guests outside the fence stand up and begin to dance also. When the men go to the left, the women go to the right.

There are three sections to this ritual song. Each section is repeated several times with variations. The first part is the introduction, the call for the people to come and celebrate. They ask the guests to come and celebrate and dance like the cockatoo bird who uses his wings and feet—meaning wholeheartedly joining in the celebrations.

The second part is the main part of the song. This part talks about sago which represents all life. The sprout of the sago tree which is cut off by the bere man represents fertility. There will be an abundance of sago packages and the sago is ready for cooking.

These people are the bere people and their duty is to chop off both ends of the sago tree. This ensures the success of the sago crop. The food wrapped in leaves refers to the special packaged wrapped for Refatu.

The third part is the closing and calls the people to get up, go outside and dance. This signals the end of the ritual.

Introduction:

Let's sing the bere song.
Let's dance, cockatoo using arms and legs.
Sago Grub Festival

The host takes several special leaves, and rubs each centerpole with them. This is done to ensure that the arriving guests will not be enemies, bringing war or controversy.

The family inside the ceremonial house forms a group to welcome the guests as they hear them arriving. They stop dancing outside the ceremonial house. Then the guests dance toward the area between the garden and the ceremonial house before stopping.

The host and his group begin to sing and dance. When they stop, the guest group moves forward closer to the ceremonial house. Then the two groups start to dance, intermingling and forming one group. They dance around the ceremonial house two or three times, then enter the house, stopping before the centerpole.

The host greets the guests and gives a welcome speech inviting the guests to participate freely in the festival. They can eat, drink, dance, and sing, talk and exchange goods with others, but he asks them not to quarrel or bring up arguments that could lead to controversy and war. He greets each group of guests in the same manner.

The guests are led to their place within their respective family groups. They sit down and eat sago so that they will be happy. Inside the ceremonial house the people are very joyful. They have a large fire for preparing sago and grubs and smoke fills the room.

3.2 Celebrating the Sago Grub Festival

The celebrating of the Sago Grub Festival includes the ritual of the bere song, the arrival of the guests, the interaction of the people with one another, and the departure of the guests.

The bere ceremony is the climax of the Sago Grub Festival. They perform the ceremony in the sacred area of the ceremonial house. In this song, the Kombai communicates directly with Refafu. They concentrate all activity on the centerpole. It is the most important moment for the host family for through this communication with the spirits, the Kombai are able to get power for all areas of their life. They receive power to restore the imbalance in the relations between man, nature, and the spirit world.

The bere song is one of the Kombai songs that deals specifically with prosperity or fertility. The bere song is sung along with other songs and the actual singing of the song is what ensures prosperity.

3.2.2 The arrival of the guests.

At last the guests arrive from various places. The ones who live closer arrive mid morning while those who come from farther away arrive in the late afternoon. Some have traveled for two or three days. The festivities go on until the following morning. Often the host will arrange a hut and food for guests who overnite on the trail. On the journey to the Sago Grub Festival they usually dance and sing. The host hangs the sacrifices on the trees near the ceremonial house so that the guests can see them as they arrive. Everyone decorates himself with necklaces of dog teeth or pigs teeth, bird feathers, possum skins, etc. They wait for the host to greet them at the edge of the clearing on arrival.

3.3 Departure of the guests

Eventually, they all leave for their respective homes. They are happy because they have eaten sago grubs until they were full. Perhaps they made trances or arranged something that they had hoped for. Some grumble because they were not successful in trading. Everyone thinks about another bigger sago grub festival in which they will outdo the present host.

The party is over. The guests have left. The family stays in the ceremonial house. Now is the time to determine the success of the party, and to ensure success for the next ritual, they burn the bird's nest.

The family continues the party until the sun starts to rise. After they hear the morning bird call, they begin to sing and dance about the end of the sago grub festival. They dance one more time. They eat sago and grubs once more (out of a large packet). The guests eat, then they start to leave. Some wait a
little because they want to buy sago and grubs by trading meat and bananas. There are those who give
gifts to the host like a pig's head.

3.3 Closing

The closing part consists of the last ritual—burning the bird's nest and the extended family members
returning to their own homes.

3.3.1 The ritual of burning the bird’s nest

Now the guests have gone, and there is one final ritual. It is performed at the centerpole inside the
ceremonial house on the two ends of the ridgepost. It is the ritual of burning the bird’s nest. The bird’s nest
is taken from the ridgepost. The people tie up one of their feet so that they dance with only one foot. They
dance to the back slowly while singing a special song about the abundance of sago. Then the nest is
burned in front of the house. This ritual affects the success of the sago.

The members of the family who hosted the festival stay at the ceremonial house. The host divides the
food and other items traded for sago and grubs. Sometimes they offer a pig in sacrifice to Refatu so that
he will be happy.

The next day they return to their tree houses. There they rest and life will return to normal. Later,
perhaps the next week or the next month, they receive an invitation to a sago grub festival from another
clan. This is a reciprocation. This is their way creating harmony and balance in life.

The ceremonial house stands until it falls down. On the centerpole the leftover bananas and sago
bundle are left hanging as a reminder to Refatu, who guarantees the continuance of their life.

Endnotes

1 Henk Venema has been working in Irian Jaya under the auspices of Zending Gereformeerde Kerken
   since 1981. He worked from 1981 to 1986 in the Komboi and Korowai area.

2 There are about 12 different kinds of sago trees, some have thorns and others do not.

3 A bere is a small nut shaped like an egg. It looks much like a small white snail that does not have an
   opening. They use this fruit in the initiation ceremony of young boys (see appendix 4).

4 Other song types include the khaio and klukeko. The Khaio songs are about creation of the earth
   and sky while the Klukeko songs are about nature and love.

5 The Korowai people often arrive in the morning or mid day and go home in the late afternoon. The
   Teakwambo people have a festival that goes for 3-4 days.

Appendix 1

The Origin of Sago

Kristian Wandergel
Wanggman tribe

In the beginning there was no sago. There were no trees and grass. Actually it was all there, but it was hidden. Men only ate sweet potato or a type of wild potato.

There were two people: a man and his wife. They had two children—a boy and a girl.

The parents always went out looking for food, while the children stayed at home. They were continually hungry because their mother and father ate good sweet potatoes and the children only got the leftovers. It happened like this every day, every week, and every month.

One day the parents went out to look for wild potatoes in the jungle. The boy and girl stayed at home in their tree house. Suddenly two small birds called urip flew from the west to the east crying, "we, we, we..."

The children began to call out to the birds. "If you are a person, hear us." The two birds came to the house and landed on the front veranda.

The children said, "If you are a person, can you bring us sago?"

Then the two birds made a sound (because they had a spirit inside them) saying, "You wait. Later when you see us flying, you stand here on the front veranda and watch us fly."

Meanwhile mother and father were still out in the jungle looking for sweet potatoes. They did not know
about the birds. The birds then flew out towards the west. They flew up and down, up and down until they disappeared into the sunset.

The children waited and waited and waited for the birds to come back. When they did come back, they brought two balls of sago.

They flew carrying the sago to the front door of the house. The bird said, "Here is some sago. You eat since you are hungry and your parents did not give you any food. Now we will help you. You can eat."

Then the birds flew away again. The children watched them fly away. They flew until they came to the sago swamp area.

The two children made a fire and cooked the sago. They ate until they were full. They drank water. They hid the rest of the sago on the cooking rack. They said, "Let's not let our parents see the sago and get angry at us." Then they waited as usual.

Then mother and father climbed up the ladder into the house. They cooked the wild potatoes and ate. The children asked for food and ate also.

Then mother sat down. She saw a sago beetle crawling by the fire. She took the beetle and smashed it on her thigh. The beetle turned to ashes. Mother saw that the ashes were not ordinary ashes. They were red in color. She looked closer and said, "My... this is like sago."

She then asked her children, "I killed a beetle and it must have been dried in the sun because it turned
to red ashes. It has the shape of sago. You certainly must have eaten sago?"
The children tried to hide their secret from their parents. Their parents asked them, "Did someone come? Who gave you sago?"

Because the children were still young, they were afraid that their parents would punish them, so they kept silent. However, their parents kept asking and asking them. They said, "Someone certainly brought sago and you ate it! This beetle is the proof!"

So the children were finally forced to tell. They told everything that happened. They told about their being hungry, about the birds that brought sago and how they ate it. Finally they gave the leftover sago to their parents. Their parents cooked the sago and ate it. They said, "It is delicious! This is really sago! This is what we were looking for."

Mother was very happy. She danced and danced. She very much wanted to pound sago. They had never eaten sago before.

They said, "Children, you wait here. Later, Father and Mother want to look for the place where the birds flew to get the sago."

Then they said, "We will hang this grass skirt and the penis gourd here. You watch them. If their shape continues to be smooth and clean, you know we are still alive. But if it gets muddy, you will know that we have been killed. So they hung the grass skirt and the penis gourd in the house.

The two children pointed out the way. "Mother, those birds flew that way where the sun sets. Follow the sun."

The parents set out to find the sago. They walked and walked until the man decided to climb up a tree to see if he could see sago. The woman danced around at the bottom of the tree. She was very happy thinking about pounding sago.

The man looked and said, "I don't see any sago. There isn't any." He climbed down and they began to walk again.

They walked and walked and walked and Father climbed up another tree. Mother danced around at the bottom of the tree. He couldn't see any sago again. They began walking and walking again. He climbed up another tree. He looked. There were several kinds of sago flowers. He called out to his wife, "I'm sure I saw sago flowers. Birds are flying around and sucking the flowers. Is it really sago?"

The mother answered, "Is it true?" She continued dancing. The man looked hard and said, "Oh, no, those are rattan flowers. I was wrong."

He climbed down again and started walking. They walked and walked and he climbed up another tree. The mother danced around the bottom of the tree. He looked for sago flowers until he saw lots of them. Birds were flying around and sucking the flowers. There was a huge sago garden. He said, "Now I really see it. There is sago!" He came down the tree and they crossed the Nellop river. They entered the swamp and found sago.

They looked at the sago and chopped down a tree. Father split open the tree. Mother prepared a large rib so later she could wash the sago. She was ready. She was very happy to knead the sago. While they were working, someone came.

In this swamp lived an old lady who guarded the area. Her name was Uwahie or Dune. She was the owner of the garden. This lady approached Mother and Father and said, "I own this garden."

Then Mother and Father said, "Grandmother, we are half starved. So we chopped down the sago tree."

Then the old lady said, "All right. You are hungry, so you can."
Later that night the old lady came. She heard the sound of people sleeping. They sounded fast asleep. With her stone axe she violently beat them. She went to see and saw that they were only sago fronds and not people. That is because the two rib leaves had already turned back to being leaves.

"Where are the children?" she thought. She looked and looked for them, but she couldn't find them. She looked and looked and then looked up. Oh, there is smoke coming out of the top of that tree over there. She saw the ironwood tree with the smoke coming out.

The old lady started hitting the tree with her stone axe. But the stone axe broke. She wanted to chop down the tree with the two children in it. Her pig had disappeared, and they had chopped up her pig. She was very mad. But she couldn't chop down the tree because her axe broke. She went to get another axe. She tried to chop it and again it broke. She went for another and it broke also. She tried, but she couldn't do it.

Then the two children commanded the old lady to become sick, so she began to feel sick. She laid down and went to sleep. They ordered the tree to split open again so they could get out and go home. They carried the meat with them. They walked until they reached a river. There was a man there. Actually it was a bird that lives on the side of the river inside a tree. Sometimes he was a bird and sometimes a man. His name was Dambilo.

The two children gave him a thigh of the pig. He ate it. Then he helped them. He took them to the other side of the river.

The old lady started to pursue the children. She got up and chased them to the edge of the river. She asked the man, "Where are my people?" The old man answered, "I've already taken them across the Ncelop river."

The two children had already arranged for the bird to kill the old lady. They had paid with the meat and said, "You can kill her."

Then the old lady wanted to cross the river downstream by canoe because she had to chase the children. But as she sat in the canoe, the old man said, "Lady, give me the stone axe. If the canoe tips over you will drown, so give me you axe and I will hold it for you." She gave him the axe. They rowed and rowed until they got to the middle of the river. Then the man took the axe and hit the old lady until she died. Then he turned the canoe around. The old lady drowned and because a fish. The bird went up and sat on the tree again, so the children were free and went home safely.

(The old people say, "If you tell the secret of the sago you will die.")
2.4 Collecting the sago grubs

After the invitations are sent out, the sago grubs are collected for three days. If they wait too long the larvae will have entered their cocoons or become beetles. They can still eat them if they haven’t come out of the cocoon yet. The people have to find a lot of grubs. On the fourth day all the grubs are brought to the ceremonial long house and wrapped. The following day the guests begin to arrive.

3. The Sago Grub Festival

3.1 The ritual of opening of the Sago Grub Festival

On the sixth day the guests arrive. The festival starts after dark.

Various young and old men sit around the sacred area. Together they sing a song which is:

We hope sago grows well
We hope sago grows last
We hope sago grows plentifully.

The language of the song is not normal everyday language, but mixed with other languages (or archaic language). The young men dance around the fence. The girls dance around the young men, once to the right then to the left. Babies are taken and lifted up to the centerpole to Refau. They want Refau to see them so they will grow well.

Finally the fence is taken down and the fire put out. During that time they sing three songs. Then they dance inside the ceremonial long house from corner to corner for about one hour. Then they go outside and dance around the house. After everyone has entered the house again, two old women each light a torch. In this way the sago finds an ‘eye’ and grows quickly. One dances with her torch from one end to the other. The second one goes the other around. Just at the spirit pole in the middle of the house, they will pass each other.

Now the stone axe and spirit pole can be touched. All night long all the people (including the guests) dance and sing. The Tsalawamba do not have their own dance, but use dances from the Kombal, Korowai, Wamborn, etc. They dance until morning.

3.2 The Wedding

On the sixth day the bride is brought to the ceremonial long house. She sits in the middle of her family while the groom sits with his family. On one side of the spirit pole and the other on the other side of the pole. The next day while it is still early, they prepare the baked sago big and thick. The groom’s family prepares some and the bride’s family prepares some. The bride’s family offers sago to the groom’s and vice versa. All eat sago together. The bride and groom ask for Refau’s blessing.

On the seventh day they dance again. On the eighth day, the guests and family from far away leave. Only the bride and groom’s immediate family remains. The bride prepares sago. She divides the sago and gives it to her husband first, and after he has eaten, gives it to the rest of the people.

On the ninth day they still celebrate. They eat and talk. On this day the bride and groom hear advice from their parents. It often includes advice such as:

The wife has to respect her husband.
The wife cannot oppose their husband.
The wife cannot run away even if she is threatened.
Appendix 3

The following two stories are as told to R. Basa.

The Sago Grub Festival among the Citak

Kristian Rambai

Amazu

The Sago Grub Festival in the villages of Vau, Imembi, Sanakop, Vyer, and Tukumau.

People construct a ceremonial long house. The priest of the god Frabora who guards the ceremonial long house, lights the fire. He guards the ceremonial long house every day. He can eat only sago and drink only water.

Then the priest goes to the sago swamp to chop down sago. He calls upon the spirit three times: "Frabora, Frabora, Frabora."

It happens like this when the people go together to the sago swamp. Then they chop down the sago trees marked for the sago grubs. The priest calls the spirit three times so that there will be a lot of grubs.

The sago trees are chopped down and left for three months. Then they prepare sago for one week. After that they begin to split the sago grub. That is, they split open the tree and collect the grubs inside. They begin by splitting the first sago tree that was chopped down. The sago grubs from the tree are wrapped by the spirit priest, cooked, and hung on the ridgepole of the ceremonial long house.

That day everyone gathers inside the ceremonial long house. When it gets dark, the priest goes up to the roof of the hut. Everyone has to be silent and cannot talk. Then the priest calls, 'Frabora' three times. They listen for an answer. If they hear a bird call, that means that the spirit has answered. Apparently, Frabora has received the sacrifice.

Then everyone begins to dance and sing noisily until dawn. The priest divides the sago grub packages among them to be eaten. He says, "This is for us. Frabora has received his already."

After this the people gather sago grubs for three days. That evening they dance and play inside the hut. Then they call other people to join in the festival. The people who come are very happy. Guests always bring dried fish as a gift to the guest or to the families who organized the Sago Grub Festival.

Sufficient food is given to the guests. They are served the sago and sago grubs that were promised by the host. They stay in the ceremonial long house and eat together. They eat, drink and celebrate for one night. Then the party ends.

Finally, the extra sago grubs are divided among the guests and the guests give dried fish to the host or his family. In doing this, they conduct a type of market. They exchange fish for sago grubs. Then the people return to their homes.

(Note: The Citak people regard the god Frabora as the creator of the sky, land, people, and every creature in it. He guards life, time, seasons, etc.)
Appendix 4

The bere as used in initiation

The bere is a small nut shaped like an egg. It looks much like a small white snail that doesn't have an opening. The bere nut is also used in the initiation ritual of young boys before they are married. This ritual, when done, is held before the Sago Grub Festival.

During this initiation ritual, the bere nut is wrapped inside pandanus leaves tied with genecom vine. This is placed on the head of an initiate whose hair has been elongated with pandanus leaves. The hair is braided in layers (see picture). Each braid is intertwined with pandanus leaves and is about 30 centimeters in length. Oil from a certain tree is added to make it smooth and sleek. The whole body is rubbed with this oil.

An older male secures the package with the bere nut on the top of the initiate's head. While he does this, the men sing the bere song. The initiate dances so that the bere will be tossed up and down and touch the pandanus leaves. The bere then makes the initiate's head wet. If the elongation of pandanus leaves does not become wet, the initiate will not have a successful marriage. This also means that the secret of the bere has been shared with someone who wasn't supposed to know. If the initiate's head does become wet, all is well and he will have a successful marriage. The purpose of the bere nut is to give fertility.

A back view of the initiate's head with the bere

Bibliography


The Kamrau Bay area: between Mimika and Maluku

A report of a short visit

Leonine E. Visser
Dept of Public Administration, Leiden University

Malakan ini adalah hasil dari penelitian antropologi di beberapa kampung di daerah teluk Kamrau, Kelurahan Kaimana, yang dihuni tiga kelompok kebudayaan yang berlajur: Orang dari Irantu, Kamrau dan Sabakor.

Pelaksanaan penelitian ini akan memerlukan pengetahuan dasar administrasi pada masa yang lalu dan sekarang, hubungan dengan Maluku (Tidore, Timeta, Sabakor) dan penduduk kelurahan. Yang kedua, tiga kelompok kebudayaan akan digambarkan seperti diagram pola kekuasaan dan aspek tertentu di dalam masyarakat, hubungan sosial di antara tiga kelompok dan kelasannya/itu merk.

1. Introduction

This paper is the result of an anthropological survey of several villages in the Kamrau Bay area, Kaimana sub-district, which are inhabited by three different cultural groups: people from Irantu, Kamrau, and Sabakor.

The following topics will be dealt with in the paper: the administrative situation of past and present times, the external relationships with the Moluccas (Tidore, Timeta, Caran), and the institution of the "kena" (kadaster). Secondly, the three cultural groups will be characterized in general terms by using the method of controlled comparison. Important cultural elements will be compared, such as the following: kinship terminology and specific aspects of social organization, the social relationships between the three groups, and their ritual.

On the basis of this short analysis some conclusions can be drawn about the cultural boundaries, compared to the linguistic boundaries, and about the interethnic relationships in the Kaimana sub-district.

2. The past and present administrative situation

The Kamrau Bay area is part of the vast area traditionally governed by the nine Roh's of West Irian Jaya, from Orin to the island of Namatota, south of Kaimana. The Roh's were subjects of the Sultan of Tidore. After 1824 Tidore and its realm on the west coast of what is today Irian Jaya became a part of the residency of Timeta, after the British incorporated it in Timeta in 1814.

In 1898 the Dutch government established itself in Manokwari and in 1926 and in 1926 West New Guinea/Irian Jaya became a subdivision of the division Timeta. Only in 1926 Fakfak became a subdivision in its own right under the newly established division 'South and West New Guinea'. Thus government control slowly approached the Kamrau Bay area, and the Roh's. With the exception of the wartime Government control slowly approached the Kamrau Bay area, and the Roh's. With the exception of the wartime (1942-1945) Fakfak remained an underdivision until 1954. In 1959 the Dutch were evacuated when the TNI army invaded the Etna Bay. By then, Kaimana became itself an underdivision, as part of the division Fakfak.

Finally in 1973, Kaimana became a sub-district within the boundaries of the district of Fakfak. So the administrative orientation of Kaimana has always been directed to Fakfak.

Today, the administrative centre of Kaimana covers about 25 km² and is inhabited by some 3650 people. Apart from a majority of Kamrau, Irantu and Sabakor people, there are people from Mimika, Mairasi, Aru, Flores, and South Sulawesi (Bugis, Bulosene). There also some Chinese merchants and Javanese civil servants and military personnel living there.

Within the sub-district of Kaimana eight desa are recognized. However, these desa only exist on paper, because their boundaries include vast areas of lowland forest and marshland, in which often as many as seven or eight settlements (kampung) are dispersed. Most of the area is rather inaccessible, and its population density drops below 1 inh./km² outside Kaimana town. Apart from the settlements at
the mouths of the Bunui and Kamrau rivers and in the southern part of Arguni Bay, most kampung have little administrative relationship with Kaimana. We were told that the former sub-district head had once travelled upstream. Bunui river to make an election tour to the Sabakor villages, but that the inhabitants did not know the present camet yet. Their only contact with ‘the government’ is the monthly visit of a Chinese merchant with whom they trade sago. Nevertheless, the villages give the impression of an ordered society.

During our survey we visited the following kampung by motorized dug-out canoe:
- Gaka (Sabakor), Desa Bunui, upstream Bunui river, about 42 RT, Werewuta (Irantu), Desa Waho, upstream Kamrau river, 28 RT (245 inh.), Ubia-Sermukku (Kamrau), Desa Waho, at the mouth of Kamrau river, 70 RT.

The number of RT inhabits are my counting, not that of the kecamatan office. In each village we were kindly met by the village head and provided with a house and pembantu for the time of our stay. The cooperation we received from the village head and the elders, as well as from other villagers was a great help. Moreover, their friendliness and charm made our short visits into a long lasting memory.

3. External relationships with Tidore, Ternate, and Ceram

West Irian Jaya has had an important function in the international trade from as early as the 17th century. The VOC tried to obtain the monopoly of the masoi trade already in 1623, but tragically failed. A second attempt in 1636 also resulted in the murder of the skipper at Namotapo island. Finally in 1678 merchant Johannes Keyes was able to start negotiations with the Raja and the Camarom merchant, but he again failed and most of his boatmen were killed (Cator 1942: 83). The masoi and slaver trade from Namotapo was strongly defended from the VOC and remained in the hands of the Raja of Namotapo and Camarom merchants (van Loghum 1963: 37, 38).

When in 1879 slavery was abolished in the realms of Ternate and Tidore, this was done with the exception of Tidore’s possessions in Irantu (de Clercq 1890: 186), where slavery was officially declared illegal only by the Pax Nederlandica of 1937-39. The masoi and slaver trade remained profitable until about the 1950’s (pers. comm. A. Mampioke, Jayapura).

During the second half of the 19th century Ternate merchants became active in the area to collect birds of paradise. As a proof of these activities are the bright crowns of bird of paradise feathers which are worn by the elder men during the legu ceremony in Sahu, Hemahemah Ternate’s influence has been felt in the Kamrau area until 1942, especially in the northern part, since they came via Bintuni.

The economic power of Namotapo dwindled after 1876, when the Dutch government opened a direct trade route to the west coast, and the main trading centre shifted to Onin.

4. The Institution of the krojaun (or radjaschappen)

The Raja of West Irian Jaya have been portrayed mainly as ‘merchant-kings’ (Cator 1942: 81, 85; van Loghum 1963: 38) with little or no administrative power.

However, their original position is that of a Raja or ‘vasali’ submitted to the power of the Sultan of Tidore. In this context, Raja is the title of the political heads of Banggai, Tobungku (Sulawesi) and of Loloda (Halmahera) under the Sultan of Ternate, and of the heads of the West Irian Jaya parts of the realm of Tidore (de Clercq 1890: 272). Hierarchically speaking, these heads held a higher position than the district heads or sergai (Rid.: 324). In Ternate and Tidore language, the Raja is called kolano, which is also the title of the Sultan himself, but of course without the same political meaning.

As in other parts of the Ternate and Tidore sultanates the Raja had to collect manpower and the produce from the land to be sent to the sultan as a gift of honour. In Irian Malay this is called ajar sebas, a term which might be connected with the Indonesian sembah (van Loghum 1963). It is in this context that we should understand the wider political significance of the inter-village raids of hongi/ we will speak about below. Men, women and children who were captured during these raids were often the ones who were consequently sent to the Raja of Namotapo in order to be offered to the Sultan of Tidore.

In the inlands, the term antar seba is used to indicate a gift of honour to the Raja of Namotapo himself, if the villagers failed to bring him a share of the produce of the land, of boats, mats, but also of hongi (gongs, Portuguese canoes, dishes), then their gardens would wither and their land become barren.

The organization of the gifts to the Raja was left in the hands of local leaders, who obtained titles, like sergai, mayor, sowoh, orang tus and kapita. These titles refer to the different functions within the Ternate and Tidore sultanates (de Clercq 1890: 324-325), although they do not have any hierarchical connotation anymore. Their occurrence is not restricted to the Kamrau Bay area. In fact, it is a common feature of local (ceremonial) leadership, both in the Northern Moluccas and elsewhere in western Irian Jaya (Visser 1984: 225).

When the Dutch government established itself in Fakfak at the turn of this century, it adopted the policy to integrate the existing and culturally embedded positions of the Raja by making them into civil servants. Their trade monopolies were broken and their revenues from it compensated more or less by a fixed amount of money per year. The Raja territorial position was strengthened by using him as an intermediary between the government and the people. However, as civil servants the Raja did not satisfy, according to the assistant-resident of Mandowari, Cator (1942: 83).

In the present-day administrative structure the Raja do not have a formal position, but they continue to act in a traditional context, especially at times of distress. Van Loghum accounts from his fieldwork (1963: 29, 30) that the Raja of Namotapo is attributed a special gift to chase away the pigs from the gardens in Twara villages (Irantu). More recently, the present Raja was asked to come to some Irantu villages for a rain making ceremony during the drought period of 1985, in exchange for which he was offered atap thatching for his house (pers. comm. J. Paulus, Kaimana).

According to the political myth, the realm of the Raja of Namotapo originates from the area near Gunung Bait in southwest Irian Jaya. Resident Hille reports (1905: 236) the myth that On Gunung Bait there lived two women, Bold Koeembang and Potti Koeboet. One night on the reef they saw a star fall; it swam to the shore and changed into a prince, Dorevet Sabau Serai Samalowen, who married Bold Koeembang. She had three sons: Balik, who became the Raja of Namotote, Aal, and Mengasi. These last two went to Lars. Bold Koeembang herself stayed on Gunung Bait and if she did not die, she may still live there.

During our interview with the former Raja of Namotapo, M. Ombayer, in Kaimana he mentioned the same origin.

The mythical hero, together with his sister, follows the water until he reaches the island Kiliwala. Tired, he rests a while and transforms into a land snake. On his way to this place (Kaimana) he plunged his spear into a place and it became land: Uphul ‘sa’ar, a kind of reef. Then he goes on, and up on his home. From there he reaches soda island (in Kamrau Bay), but he sees nobody. Who will guide him further? He seeks the birds, but only the flying fox (pandel) dare to take him to Namotapo. The island is empty. He sits down on a tree branch. Then a local comes near with people. They look into the water and see his images. Then they took up and see him. He says: I am the Raja. They want to test him: the one after the other they dive under water with a burning torch. The torches die, except his one. Then the Raja again makes land with his spear. He makes a place with salt, and plants start to grow. People come to the island to live there on Namotapo (which means, In Baladesis: Upolu rama = en delam, toda = barong ringan yang betul).
In 1942 Cator noted that, from Rumbat to Namotota, five of the eight Ra'is and the Ra'as-Kemisi of Kaimana were in function. Today, notwithstanding the fact that their position is not formally recognized, all Ra'is and the Ra'as-Kemisi are in position, according to M. Ombayer.

5. Buruul, Sabakor, Kamrau, and Itarutu

Let us now concentrate on the internal relationships within the Kamrau Bay area between the cultural groups of Sabakor (Buruul), Kamrau, and Itarutu (Argun). So far only one anthropological study is known, that of Van Loghui of the Twara village group north of the Arguni Bay (1965). Of Sabakor and Kamrau only some wordlist is available which have been gathered with inomers outside their villages, but no anthropological data are known until now.

It is revealing that the language spoken by the Sabakor people was called 'Asinara' (Anceaux 1958: 116), which in Kamrau language means: people with curled hair, Papua, which has a rather condescending meaning, like the Moluccan 'atiftu'. The Kamrau language was indicated to be equivalent with 'Iri' (Bald: 117). In fact, 'Iri' is the name people from the Kamrau village of Ubia-Sermuku give to the Itarutu dialect of the Werauta, Rauna and Fruta village group.

Apparenty different cultural and language dialect groups are indicated by different names, varying from village group to village group. For example, the Kamrau people of Ubia-Sermuku call themselves (of course) the people: Garira, and the Burnai people (who call themselves Sabakor): Medewara, after the river Mandawa they live in. Likewise, they call the Itarutu people from Werauta ‘Nobura’, after the Nobe river. These terms show that the territorial delimitation by watersheds is a salient feature in the social relationships between villages, probably even more so than language differences.

The settlement pattern of the Sabakor, Kamrau and Itarutu shows a remarkable resemblance, for example in the classification of upstream and downstream settlements as village-scales or village segments. The upper half of the villages of Werauta is classified as the elder (kakar), as opposed to the downstream or younger (adik) half. Also, the upstream village of Werauta (Itarutu) is considered the elder as opposed to the downstream village-sitting of Ubia-Sermuku (Kamrau), itself being divided into an elder and a younger half. Here again, the social classification seems superior to the linguistic distinction.

Itarutu political myths in oral history (tuire) relate their origin to the north, to Gunung Nabé. This is where their forefather, Nimirum, supposedly came from (pers. comm. D. Surninde, Kaimana). In a myth we recorded in Ubia (Kamrau), two forefathers Airabo and his adik Airbu, set out from the mountains. The elder brother stays upstream while his younger brother makes himself a canoe and settles downstream. The former village head of Gaia (Sabakor) tells the Burnai version:

The first man had two sons, a hunter and a fisherman. The elder son hunted a cassowary, and they ate it all, forgetting about the younger brother at the seaside. He wanted to eat the head, but his brother had already taken it. This is how they split up: the elder brother moved to a place south of Tairi, where there was plenty of sago. They liked the place, but there was no water. So they moved around until they found this place where there is water, even during the dry season. The younger brother stayed behind, in Babo.

The following account is interesting because it shows the close relationship between the Sabakor people and the Itarutu from Fruta, Werauta, and other settlements. It was told by the adat elder/war leader (kusunandafa) of Werauta.

The mountain people (from Fruta) and the Sabakor/Buruul people were both hunting wild pigs. But the dogs of the latter, who was the elder, caught all the pigs and other game, while the people from Fruta only caught moles (titatu tana). So when there was a feast, they were ashamed, and moved upstream.
Cross versus parallel siblings.

<table>
<thead>
<tr>
<th>ZCh/BCh</th>
<th>BCh/ZCh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabakor</td>
<td>anameta</td>
</tr>
<tr>
<td>Kamrau</td>
<td>anameta</td>
</tr>
<tr>
<td>Irarutu</td>
<td>mo</td>
</tr>
<tr>
<td>Mairasi</td>
<td>tato</td>
</tr>
<tr>
<td>Mimika</td>
<td>watako</td>
</tr>
</tbody>
</table>

Unfortunately, my own data on Mimika are not reliable in this respect. I was given the term of watako for BCh/ZCh (brother or sister’s child). However, Pouver (1955: 79) clearly notes the terminological difference between watako and kamurima. Pouver consequently refers to information by Zegwaard about the Asmat, where a comparable distinction is being made: Petar Zegwaard ... deelde nog mede ... dat de Asmat, als hij spreekt over zijn zuiker, op zijn achterste wijd van daarop slaat. (Pouver 1955: 79).

I do not know about such a symbolic meaning of the terms in Sabakor/Kamrau.

Another comparison is that of affinal terms. It is noteworthy that in Sabakor and Kamrau, like in Mimika, the affinal children and parents address each other with reciprocal terms, which is not the case in Irarutu.

Affinal terms.

<table>
<thead>
<tr>
<th>WB/ZH = BW/HZ</th>
<th>SW/DH</th>
<th>SpP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabakor</td>
<td>kawara</td>
<td>amada</td>
</tr>
<tr>
<td>Kamrau</td>
<td>araira/esarara</td>
<td>yomawa</td>
</tr>
<tr>
<td>Irarutu</td>
<td>arai</td>
<td>netene</td>
</tr>
<tr>
<td>Mairasi</td>
<td>nebuwa</td>
<td>masara</td>
</tr>
<tr>
<td>Mimika</td>
<td>orame</td>
<td>orame</td>
</tr>
</tbody>
</table>

So here appears to be a differentiation according to the sex of the speaker which we did not find in Sabakor/Kamrau.

Another important relationship is that between parents and children. In all three societies taxonomy is a feature, but only in the first two cases a distinct term is retained, like it is in Mimika and Asmat.

Parents and children.

<table>
<thead>
<tr>
<th>X's father</th>
<th>X's mother</th>
<th>F</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabakor</td>
<td>-awaida</td>
<td>yara</td>
<td>nanara</td>
</tr>
<tr>
<td>Kamrau</td>
<td>-awaya</td>
<td>yaira</td>
<td>aira</td>
</tr>
<tr>
<td>Irarutu</td>
<td>-nje</td>
<td>ndene</td>
<td>ndene</td>
</tr>
<tr>
<td>Mimika</td>
<td>-ayuku</td>
<td>-awote</td>
<td>bayaeto</td>
</tr>
<tr>
<td>Asmat</td>
<td>aricpold?</td>
<td>-awos?</td>
<td>ndwi</td>
</tr>
<tr>
<td>Mairasi</td>
<td>nambemani</td>
<td>nambae n</td>
<td>nani</td>
</tr>
</tbody>
</table>

Apart from these kinterms, other socially important relationships are indicated by separate terms, for example the already mentioned adik/akak relationship. In Sabakor the composed term abodarama means: they are elder/younger brothers. In Irarutu this sibling relationship is indicated by the term melute-talante: they are elder and younger. Opposely, the adik/akak relationship between a brother and a sister is indicated by the term yoworbew (lit. female-male) in Sabakor, and by the term rimene-timbee in Irarutu.

Also, a social category as a whole can be glossed by a single term, like the category 'in-laws' in Sabakor: kawaneda, which applies to wife-givers as well as to wife-takers. Finally, one finds glosses for the category of those who are intimately related (saudara dekat), like the Sabakor term disineras as opposed to the term sarers for the category of persons one feels distantly related to (saudara jauh). A similar distinction is known in Mimika (Pouver 1955:79).

Op alle genoemde generaties omvattende bilaterale verwanten past man tenslotte, zowel individueel als collectief, de onderscheiding 'acht' rata tegenover 'ver verwijderd' amikiae toe.

7. Social organization

Sabakor, Kamrau, and Irarutu people reckon descent through the male line, in the sense that they consider those who carry the same clan name as related by 'blood'. Austroasiatic origins do not apply here, as the following comparison of the different concepts for "blood" relationship (satu darat) shows:

Comparison of different concepts for "blood" relationship.

<table>
<thead>
<tr>
<th></th>
<th>blood</th>
<th>one</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabakor</td>
<td>esa</td>
<td>sasiawara</td>
</tr>
<tr>
<td>Kamrau</td>
<td>eta</td>
<td>abanara</td>
</tr>
<tr>
<td>Irarutu</td>
<td>eso</td>
<td>wamase</td>
</tr>
</tbody>
</table>

These concepts are remarkably close to the Asmat word for blood; es, although I am not sure whether the Asmat use it as a social concept, apart from the concept of the pratu which is apparent from their yee organization (Edey 1967). A striking fact is that the Non-Austronesian Tobaru people who live in the interior of northern Halmahera, also use this word for 'one blood' esa moi, quite unlike the concepts their neighbours use (Tobelo: tau moi, Sahur: ngasu rimoi).

A Sabakor, Kamrau, and Irarutu ego reckons his kinship to both father's and mother's kingroups (including their in-laws) in what is usually called a bilateral system. Marriage with first and second cousins is regarded incestuous (Buku miskan darat). Irarutu: tuwe. The village or village group are predominantly endogamous or, like one woman from Gaia (Sabakor) put it: I prefer not to marry into Gunissi across the river, because their bananas do not grow from the same stem.

Marriage arrangements are accompanied by a constant flow of material goods from the future wife-takers to the wife-givers. The composition of the harta in the three societies concerned does not differ in principle and in fact mirrors considerable mutual contact between them.

Harts (S. burina, K: burina, L: muer) always and only consists of permanent, mostly metal goods, like:
- colonial cannons (Malay: kelin; S: minikura, K: miniliru, L: etatene).
- Chinese jars (Malay: guci, now rare, S: moren).
- Chinese and modern dishes of all kinds.
- bracelets (S: karara, K: arara, L: kar).
- earrings (S: wirbora, K: sobura/umya, L: notya).
- cloths, clothes. No kain timur.
Harts is exchanged primarily against food from the wife-givers. This exchange of food is called "seninaring" in Irantu, whereas the exchange of gifts between the two groups as a whole is called "sasada" in Sabakor. First of all, cooked sago is prepared, either in the form of sinol or of pepaeds. Also, cooked bananas, cocoyam (keladi), cassava, and cooked fresh water fish, pig, and iguana meat are offered to the wife-takers. Furthermore household utensils, like sieves, different kinds of male and female verdags (nokan), and (formerly) bark cloth (K.papoe, tawerwa) went along with the bride to her in-laws.

The size of the harts which shall be paid for a girl depends largely upon the size of the harts her father has to pay for the bride’s mother, because he has to repay the relatives the exact amount of harts they once contributed for himself. For example, one cannon may be repaid (and thus should be included in the daughter’s harts) by one cannon, or by one Chinese dish plus one bracelet, or again by two or three birds of paradise (formerly). In van Loghum’s time (1958) one cannon cost 11 100,- to 11 200,- in Tiwara; today it is estimated at Rp. 200,000 to Rp. 300,000 in Wenerufa!

The repayment does not only depend upon the amount a relative has contributed before, but also on the closeness of the family tie. If the relationship is very close, then maybe only a ‘soft price’ is asked, for example four tumung sago for one cannon.

Harts in fact should not be translated by ‘mas kewin’, because in Eastern Indonesian societies like Sahu, Tobelo, but also in Sabakor, Kamrau, and Irantu, it includes any exchange of goods by the wife-taking group, not only at marriage, but also at the socialization ritual of the first-born child, at the initiation ritual of boys and girls, and at burial rituals. There is a constant flow of goods, harts, associated with the crucial moments in an individual’s social life. Harts-goods received and the obligation to contribute goods moreover inherit from father to son, as they are handed down along ‘chains’ of harts-obligations between affines and relatives (cf. van Loghum 1963: 156-158).

The impact of these inter-generational and inter-ram harts-chains can be fully understood only if one also recognizes the gift exchange at other life cycle rituals, like the initiation ritual. In Sabakor, Kamrau, and Irantu this ritual is performed shortly after marriage or at the age of about ten, and only for the first son and daughter (e6, e2). This might explain, by the way, the terminological distinction between e6 and e2 on the one hand, and the younger siblings on the other. Moreover, the harts arrangements mostly concern the marriages of first sons and daughters.

In this ritual, called ‘tusuk hidung’ because originally the soft part of the nose was being pierced by a small bone of the casowary (In Sabakor and Kamrau) or of the tree-kangaroo (in Irantu), the MB plays a prominent role. Being the representative of the mother’s line, he is the guardian of the fertility and the physical well-being of the members of his family. He may even, in a fight, intimidate his ZB by showing him his breasts, implying to say: You have grown up from these nipples, do not dare to be unworthy of them (Sabakor).

In the Sabakor village of Gaka, the newly wedded girl is said to go back to her mother’s place shortly after her marriage for the performance of the tusuk hidung ritual mb’a which is performed by her MB. Its main aim is to preserve the name of the maternal line (tusuk dja purye saku). At this ritual, the MB receives a special part of the harts he ZH received for his daughter.

In Kamrau, the initiation ritual is called erborina (‘kas pakan babi’) and in Irantu wenengganere (‘kas paka nakerare’, tree-kangaroo). Here it is performed earlier, but also serves as a means to get even with harts obligations. In Wenerufa (Irantu) we discussed a case in which relatives of both parents were invited to assist at the initiation of their son at the age of about ten. The wife-taking groups of the two ascending generations had to come with repayments of harts to the boy’s father, in order to enable the grandfather of the boy to get even with the price he had paid for his boy’s grandmother (WM of the boys father). This is called ‘tusuk harts nenke’. Here again, the MB is separately given a part of the harts by the boy’s father, namely an earring which the boy carries in a netbag during the ritual.

It is very important that the harts arrangements of the second generation are settled at the moment of the social initiation of a grandchild, who at this ritual also acquires a ‘social’ name (name hidung) which is most likely inherited from his grandfather. So the life cycle is closed in three generations, an idea we also find elsewhere in Indonesia and in Irian Jaya.

8. Inter-ethnic relationships: from raids to church

There are many old stories about the phenomenon of inter-village and inter-ethnic raids in Irian Jaya, about head-hunting, etc. Unfortunately, little is known about the social motives to engage in such a raid.

In the Kamrau Bay area inter-village raids (called ‘perang saku’ or ‘pigii honggi’; Kamrau: merere ra’ara, Irantu: merau) have been a major constructive force in the network of social relationships between the different ethnic and language groups of Sabakor, Kamrau, and Irantu. These people do not seem to have raided beyond this area into Mairasi and Miminika.

Two main social motives were mentioned to me for a man to engage in a raid. First, he is made ashamed because his wife has been bothered by a man from another village, and second, because his daughter whom he had given away in marriage to another village, had run away. The man will look for relatives who are willing to join him in ‘ revenge’ (tutup mailu), not only in his own village but also among his in-laws in other villages. For example:

From her (Ubia-Semuk) we go honggi to Burui or to Agunti. Therefore we should first go to Tanggaromi and Bahumi (other Kamrau villages), and even until Werenota (an Irantu village) to invite them. Then we come all together here, before we start off. We take off the heads of the leaders, we take their women and children, whom we bring back home as slaves owa. We bring the heads back in our canoes and sing. The women hear our singing and they come to the river banks to welcome us with their dancing. We come ashore and put the severed heads on a pole, and we all dance around them (counter-clockwise), maybe one or two nights, before we take them away across the river where we hang them. So we make a big feast, and after that our relatives go back home to Werenota, to Bahumi, to Waho.

The dancing this informant spoke about, he called lego in another context, namely the initiation of a new adat house, where the women danced as if the men came back from honggi. Likewise, when three blackwood staves were taken from the forest to build the church recently, the men also drummed and they all danced like before.

It is very likely that this kind of ceremony is closely related to the mortuary rituals of the Taboelo and Galela, and the harvest ceremony of the Sahu of northern Halmahera.

In Werenota the former warrior leader added some more information to this. According to him, affines from other villages are informed about the plans for a raid and invited to join by sending them a bamboo container full of tobacco and chilli peppers. The raided village is not attacked as a whole, but only those houses where the people involved in the matter live. Any relatives of the raiders are not killed, but their...
children taken captive. They are adopted into the family of the warleader. The parents of the child could come after the raid to buy their child back, by paying an amount of harts to the hargi leader. Or, the child could stay and marry in the village.

This is a remarkable piece of information. It does not fit, for example, with the Asmat custom in raids, where children taken captive cannot be exchanged for harts by their parents (pers. comm. Voorhoeve). On the other hand, it reminds me very much of some ideas expressed in the Sahu myth about Mua ma Jum. In the Gamnyal version of this myth which has been filmed in 1982, Raja Bakole adopts the girl Mua ma Jum after he finds her in the forest. But her parents, called 'people from the interior' or Gilitre Gelet (Visser 1984: 14, 35, 209), come to take her back. They do not succeed, but Raja Bakole compensates them for their child by paying them an adoption fee, called hohihe in Temrate language.

In general the inter-village and inter-ethnic raids seem to be motivated by a feeling that the village ‘grows weak’, that it loses its fertile power. This loss might consequently be counterbalanced by the (forced) adoption of a certain quantity of children and of women from raided villages, and by the victory of the men.

Religion has quite a different impact on inter-village relationships. The Protestant mission (Utrechtsche Zendings Vereeniging) started, not in Fakfak as might be expected, but in Bintuni and came to the Arguni Bay area in 1911. By that time Islam had already a foothold along the coasts of western Irian Jaya, but not yet in the interior. In 1915 the Dutch missionary Weusten reported that the influence of the Raja of Namatora was so great, that the people in Kaimana and surroundings told him they had already embraced Islam (Slump 1933, in van Loghum 1963: 63).

In 1924 a Protestant school was established in Kaimana, but only during the 1930’s several missionary teachers were posted in the Irunu area. From 1935 onwards the UVZ was replaced by the MPK (Molukse Protestantse Kerk).

A decree of 1912 did not allow the Catholic mission to work in Irian Jaya west of the Etna Bay. In 1928 this restriction was removed, and the first Catholic missionary set foot in Kaimana in 1934, from where he spread his activities to the Irunu village of Mabriema (van Loghum 1963: 66).

Of the villages we visited in 1986, only Werefuta was Catholic. According to the local guru, the Catholic mission had started from Kokas in 1947, and from Mabriema (now Frutau) in 1953. Until 1977 Werefuta and surrounding Catholic villages belonged to the Franciscan diocese of Jayapura; after that year they were reached by the Augustinians from Sorong, who are based in Kaimana.

In the Protestant villages the present church is the GPL. Many of their ministers come from the Central and Southeast Moluccas. They often start a school as well, like in Ubda-Sermuku. Since 1952 teachers graduated from the Jongens Vervolg School in Fakfak took over education from the religious teachers. Until 1982, they came from the CDO (Opkliking Dorps Onderwijs), which was renamed Sekolah Guru Bashe afterwards. Inpress schools only exist in the cross-village, like Waho, and in Tanggaromi, but in many villages the people themselves have built a school and pay the teacher, often assisted by the Teyasan Persekolaharian Kristen.

The impact of religion on the inter-village relationships in, for example, Irunu has been that people from a village group who used to have marriage relationships with each other, are now being separated because of religion. The Frutau, Rauna, Werefuta, Manggera, and Warmenu-Egwerwa village group for example is now split up between the first and the last two villages, which are Catholic and Protestant respectively. Consequently, the inter-marriages have stopped between these two parts. Likewise, south Irunu villages which embraced Islam, like Nagura and Mandiwa, do not intermarry with other villages of that area which are Protestant. On the other hand, religion nor primary education are at this moment strong enough to constitute a real integrating force in the Kamrau Bay area, because of the severe lack of infrastructure.

9. Conclusions

We started this survey with no other reference than van Loghum’s study on northern Irunu from the late 1950’s. Yet, linguistically Irunu was known to be notably different from the Sabakor and Kamrau groups, as the former belongs to the Austronesian languages and the latter two to the Non-Austronesian languages.

However, a controlled comparison of specific cultural and social elements showed a remarkable degree of comparability and continuity between the three groups of Sabakor, Kamrau, and Irunu. For example, the concept of ‘blood’ and the way in which kinship is reckoned through the male and the female lines, their initiation of a boy or a girl, the marriage ceremony, and the exchange of harts at the occasion of the main rituals in an individual’s social life do not differ in principle. They differ with respect to specific elements by which every cultural group is identified. For example, the animal bone which is used during the initiation ritual and which is associated with ancestral origins, or the food which is offered by the bride to her in-laws. It is mainly from this kind of specific elements that we get the impression that the Irunu are primarily ‘land people’: they value the meat and bone of the tree-kangaroo, the cocoyam (which is offered roasted by the bride), and they trace their origin back to the area northeast of where they live now. Contrarily, the Sabakor and Kamrau people, who value pig and sago, and trace their origin back to the marshland south and west of where they live today, seem to be better characterized as ‘river people’.

Notwithstanding the language differences, the three groups have undoubtedly had a relatively close contact for a long time. They know of each other by specific local names indicated by the territorial boundaries of watersheds. The inter-village raids established social contacts and even harts exchanges between villages from different language groups. In fact, their social networks seem extraordinary wide in an area which looks rather inaccessible, and where the population density is less than 1 inh/km².

But the people from this area live their own lives in a very ordered world in which they feel secure. It was this show of confidence which struck me when a young girl from Gaka said she would travel back to Kaimana with us, to see whether she could visit her relative in Fakfak. No sandals, no towel, nothing but the dress she wore, a noken, and three tuman sago; thus she went.

Endnotes

1 This paper was presented to the Second Eastern Indonesian Seminar in Abepura, Irian Jaya, 18-25 July 1988.

2 The survey was carried out together with Dr. C.L. Voorhoeve from 2 August until 19 September 1986 within the framework of the Eastern Indonesia Program of PTT/LPI (Code KA 050 IDR 002; Setkab permission no. KL 02.03/SSBK 0003). Financial support was provided by the Van Eeghen Foundation (N.T., Amsterdam).

3 In which the first term literally means 'anus-eaters'.

4 Peckham (1981:63) gives nevu for a 'man and woman's sibling-in-law', masare for a 'woman's parent-in-law', and embili for a 'man's parent-in-law'. These last two terms are used reciprocally as well (ibid:48).

5 Personal communication C.L. Voorhoeve.
Marriage alliance among the Moi of Irian Jaya (Indonesia)\(^1\)

Paul Heenen

Centre for Australian and Oceanic Studies

Nijmegen, The Netherlands

Memaksai pendekatan Radcliffe-Brown untuk mempelajari struktur sosial secara hubungan kesatuan/struktur sosial ‘Moi’.

Bagaimanapun, Heenen mendapatkan pendekatan penelitian yang dikemukakan Lévi Strauss di mana ikatan pernikahan mendapat posisi idaman dan biasa dipelajari dalam masyarakat suku yang dikenal sebagai ‘Moi’.

Kerangka berikut ini menggambarkan sistem perekutan perkawinan suku yang dikenal sebagai ‘Moi’.

"In human society, kinship is allowed to establish and perpetuate itself only through specific forms of marriage" (Lévi-Strauss 1963:52-53).

1. ‘Loose’ and ‘tight’ social structures

Terminological and typological uneness soon made this presence felt when anthropological research got under way in Western New Guinea (now Irian Jaya) in the 1950’s. The uneness was a result of the discovery of societies which appeared to lack a clearly recognizable structure. According to the first ethnological synopsis of New Guinea, “Papuan culture” is characterized by the lack of a ‘tight structure’, with the consequences that “so many cultural elements remain implicit”. This is expressed in a “confusing diversity of forms” between and within societies whose members are thus designated as “cultural improvisers” (Held 1951:51-55).

This uneness was particularly conspicuous in the field of kinship analysis. The familiar lineage model which had been successfully applied to the interpretation of African societies turned out to be of limited value in the case of New Guinea. Nonetheless, most anthropologists fell into the trap of what Barnes (1962:5) calls ‘the African mirage in New Guinea’:

"When in several respects these societies were discovered not to operate as an Africanist might have expected, these deviations from the African model were often regarded as anomalies requiring special explanation" (Barnes 1962:5).

This mirage meant that researchers jumped to conclusions in labelling these societies as ‘loose’, ‘flexible’, ‘incoherent’, or even ‘unorganized’. The African model is based on the idea that it is only lineage recruitment that creates permanent social integration. ‘In kinship systems cognatic kinship cannot provide this; it is only made possible by the use of the principle of unilineal descent’. was Radcliffe-Brown’s premise (1938:43). Leaving the question of whether the supposed primacy of kinship actually corresponds to the New Guinea situation to one side, it is often cognatic, bilateral relations which are prominent:

"The throwing into relief of unilineal descent by using it as a parameter of analysis, comparison and classification, tends to cause an underrating of the specific importance of the bilateral infrastructure and of the horizontal stress in many New Guinea kinship systems" (Pouwer 1966:273).

The overrating of vertical, unilineal kinship relations tends to imply the underrating of another important type of horizontal integration: marriage. When Lévi-Strauss made a major contribution to anthropology with the publication of his ‘Les Structures Élémentaires de la Parenté in 1949, however, the so-called alliance approach, in which marriage ties occupy a central position, began to gain a following:
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2. Matrilateral cross-cousin marriage

Symmetrical sister-exchange—a type of marriage in which two brides are exchanged for one another, either simultaneously or in the course of time—is not found among the Moi. In fact, they regard it with disapproval when questioned about it. One informant replied: 'It is not objects to be exchanged just like that.' He was referring to the fundamental importance that this society attaches to the circulation of marriage gifts. Moreover, an exchange marriage of this kind does not agree with the asymmetry in the circulation of bridewealth that is propagated. The Moi practice preferential matrilateral cross-cousin marriage. This type of marriage creates asymmetrical marriage alliances with the following characteristics. 'Alliance' can refer to both the field of relations through marriage and to relations in the (socio-) economic sphere. Both aspects feature as basic components of Moi society. This article concentrates on marriage relations. Elsewhere (Haenen: 1987a, 1987c) I have dealt with (the history of) other forms of alliance among the Moi. Haenen (1984) provides a general introduction to the whole Bird's Head Area.

Whenever a group of kin has a marriageable woman at its disposal, or is in need of one, a number of competing considerations affecting alliance are raised. Should an existing marriage alliance be continued, or should it be terminated? I know of certain kin groups that they would never dream of engaging in transactions with a particular other group which has repeatedly behaved in an irritating fashion with respect to the exchanges. Naturally enough, the (ex-)partners in the quarrel had a different story to tell. On the other hand, there are alliances which run smoothly, where disension is reduced to a minimum and where all those involved do their best to maintain the contact through marriage. This is not always feasible. For instance, the wife-giver may not have a marriageable woman at their disposal at a particular moment, or the wife-takers may not be successful in amassing a sufficient quantity of marriage gifts. Another factor, which is growing in importance in the coastal areas, is the personal preference of the marriage candidates. At all events, whatever consideration may gain the upper hand, the guiding principle remains that of creating asymmetrical alliances. In theory at least, this means that Ego cannot marry with a woman of his father’s sister’s kin. Contravention of this prohibition implies that Ego takes a woman from the very group to which his father has given a woman (father’s sister). Although in such a situation the women in question are not exchanged against one another because both transfers are accompanied by marriage gifts, it still has the undesired consequence of symmetrical alliance. To avoid this, both the wife-givers and the wife-takers need to have marriage links with at least one other kin group; if A gives a wife to B, B should do the same to C. If this pattern is followed in the two succeeding generations, the alliance segment is produced that is shown in figure 1. This indicates how the kin groups A and C function as wife-givers and wife-takers respectively vis-à-vis the kin group B. Ego (B3) marries his mother’s brother’s daughter (a3), just as his father (B2) did with a2.

From the point of view of the wife (b3), there is marriage with a father’s sister’s son, just as her father’s sister (b2) had married C2. In other words, in the second and third generations, father and son marry their maternal cross-cousins, while the corresponding sisters marry their paternal cross-cousins. The Moi husband and wife use the following expressions: ‘lesem in temen kyam’ (‘I marry my little mother’) and ‘tesemin temiy deli’ (‘I marry my son’). These terms used by the marriage partners show how much importance is attached to this type of marriage. The relation of Ego (B3) with his mother in terms of alliance with her kin group (wife-giving calls for a continuation in the form of a wife which follows the pattern of the relation of his father (B2) with his mother (a2). ‘Mother’ and ‘little mother’ are thus structurally interchangeable. There were even informants who omitted ‘little’ as irrelevant. This ‘interchangeability’ also holds for the mother’s brother (a2) and his son (a3), who are both addressed as ‘tegak’ (‘uncle’). Mutatis mutandis, the same holds for the relation between Ego’s sister (b3) and the wife-takers.

Although the alliance segment illustrated here suggests a prescriptive marriage system, this is not the case among the Moi. As I have already been pointed out, and again I have to refer to the many kinds of considerations affecting alliance by marriage, relations of alliance are characterized by flexibility. Preference is given to marriage with the mother’s brother’s daughter. An ideal type of such a situation is shown in Figure 1, in which three kin groups adopt the preferred type of marriage over three generations. The following section deals with the forms of alliance which are actually realized in practice. It may already be pointed out, however, that an example of this flexibility can be seen in the use of the same term of address.

Figure 1: Ego’s kin group (B) operates over three generations as a wife-taker with respect to A as wife-giver with respect to C. The terms of address are indicated for the (affinal) kin categories illustrated (upper: male speaking: lower: female speaking).

*Before Lévi-Strauss, marriage had been discussed largely in the context of the evolution of kinship groups; legitimate marriage was necessary to provide for legitimate offspring to replenish the group. Lévi-Strauss turned this on its head. Kinship groups, he argued, were simply units in a system of alliances, or 'excesses' by marriage. The real differences between kinship systems, then, lay in the different ways in which they moved women around the system in marriage’ (Fox 1967:23).

The alliance approach has met with a warm welcome everywhere, though. By turning the conventional relation between kinship and marriage on its head, Lévi-Strauss might be accused of going to the opposite extreme. Nevertheless, it is worthwhile to (re)view the ethnological field of study of New Guinea in terms of this approach. It might be expected to reveal that a number of the ‘loose’ social structures are, in fact, a good deal ‘tighter’ than was supposed. At least, that was my experience among the Moi. In the midst of all kinds of ‘loose’ and apparently ‘inherent’ social facts, the alliance approach irresistibly forced itself upon me.3
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(only differentiated by masculine and feminine forms) for all (affinal) kin in the parents’ parents’ generation. The men are addressed as ‘tabuagum’ (‘grandfather’), and the women are addressed as ‘tabuagum’ (‘grandmother’). This means that in the second preceding generation, Ego makes no terminological distinction between the two groups of kin, those of the wife-takers. Moreover, Ego uses the term ‘tabuagum/tabuagum’ to refer to all the (affinal) kin with whom no alliance by marriage in the parents’ generation has taken place. In terms of figure 1, if Ego’s mother (1), unlike Ego’s father’s mother (4), does not belong to the kin group A, then Ego addresses his prospective bride (6) correspondingly as ‘tabuagum’. Thus, if two kin groups skip over a generation in their alliance relations, the result is an affinal distance which is expressed in the term: ‘tsemim tabuagum’ (‘I marry my grandmother’). It should not be forgotten that we are still concerned in this case with Ego’s preferred marriage. The alliance between A and B got underway in the first generation, and it is now reinforced by marriage with the father’s mother’s son’s daughter. Confusion can arise, however, if more than one generation is skipped. It then becomes uncertain whether the bride in question, who is still addressed by Ego as ‘tabuagum’ belongs to the earlier group of wife-givers or wife-takers. In that case, the ‘nik fokus’ (‘history men’) are consulted. They may not be able to read and write, an informant stated, ‘but they know all there is to know about marriage relations.’ The ‘nik fokus’ thus occupy an important position in the politics of Mol marriage alliance, especially in complicated cases. In the uncertain case mentioned above, their remarks were illuminating. We shall return to this in the discussion of the relation between symmetry and asymmetry.

3. ‘Small mothers’ and their many appearances

In order to tackle the question of the actual patterns which result from the dominance of the preferred marriage, we start from an alliance segment of five groups covering three generations. This makes it possible to approach individual Mol in so far as they take part in marriage exchange as members of a kin group. For clarity’s sake, a ‘kin group’ in this article refers to a patrilineal descent group with a (patr-)inlocal residence pattern. The Mol have some 80 clans which are broken up into an even larger number of such exogamous groups. Five clans are illustrated in figure 2 (A to E): the Su, KalaBin, Mill, Malasemé and Samolo, together with the name of the local descent group in question. It is striking how different the

patterns of alliance are for each generation. A is the only group to give a wife to B in each of the three generations, while C only engages in marriage alliance with B in the third generation. Whatever the reason may have been, it seems that B acquired its wives elsewhere in the two preceding generations. It is only with the giving away of Yosefina that Malasemé KalaBelin begins or renews an alliance with Mill KalaDel. The reverse situation holds for the relation between A and E. The giving of wives by Su Kalaloouk to Samolo KalaWeva stops, temporarily or perhaps for good, at the third generation. B and C occupy an intermediate position. They skip a marriage alliance in the second generation. In short, alliance between two groups reveals a shifting pattern in which the number of wives involved is not necessarily limited to one per generation.

Figure 2 also shows that in the first two generations A gives wives to both B and E. This is a consequence of the non-prescriptive nature of the alliances. It provides a kin group with the freedom to surround itself with a plurality of groups of wife-givers or wife-takers. Both Peminas KalaBali and Bonifatius Samolo KalaWeva address their preferred wives from Su KalaLooew with the term ‘little mother’. They both marry their mother’s brother’s daughter (MoBrDa). Blandina and Robekka respectively. It should be noted that these are biological MoBrDas. The Mol seem to be exceptional in this respect, for in his ‘topical Cook’s Tour through West New Guinea’, Power concluded that

‘even in areas with a preference for (not a prescription of) marriage with mo.br.da. (Amararo, Central Moeroe), a marriage with a biological mo.br.da. is not allowed or is frowned upon’ (Power 1966:276).

When I asked the Mol for an explanation, they neither frowned upon a marriage of this kind nor differentiated between biological and classificatory kin. The collections of genealogies bear this out. Nonetheless, biological MoBrDas are a tiny minority. Many kin groups, especially in the interior, are demographically weak, and it is not always easy for them to find a marriageable classificatory MoBrDa, let alone a biological one. The marriage between Dominggus KalaBali and Albertina Su KalaLooew is an example of this. Dominggus’ mother had two brothers, of whom one died in infancy and the other as a bachelor. As a result, Su KalaLooew had only his mother’s father’s son’s daughter (MoBrDa) to offer in marriage to Dominggus. In structural terms this ‘distant’ relation is no different, for Albertina is also addressed by him as ‘little mother’. Still, it does indicate how the demographic factor can affect the flexibility of the policy of alliance that is followed. If Dominggus had not been able to marry his son’s daughter, however, we would have had to revise or initiate another alliance. In the event that Dominggus’s son, on the other hand, were in fact to take a wife from Su KalaLooew, it would be a father’s mother’s brother’s son’s daughter (FaMoBrDa). The resulting pattern of alliance would be the same as that created by Mill KalaDel and KalaBali.

These preferred marriages all concerned kin of the same generation. However, the Mol also have preferred marriages where the marriage pattern is a generational difference. An example of this is figure 2 would be the marriage of Peminas KalaBali to Gelisild KalaLoouw or Albertina Su KalaLooew. As far as Gelisild is concerned, however, the condition that she be younger than Peminas’ mother Kebabibamu applies. In other words, mother’s younger sister and mother’s brother’s son’s daughter are regarded and are regarded as preferred marriage partners, and are accordingly classed as ‘little mother’. However, we should add that the greater the age disparity between the potential partners, the smaller the chance of such marriages becomes. Mutual affection and faithfulness in marriage are doubtless matters in cases where age disparity plays an important role. Many adulterous relationships, and all the social conflict which they may cause, are to be explained in this way. For example, there is a large age disparity if Ego marries the widow of his father’s younger brother. She is also classed as a ‘little mother’, and thus after the death of her husbands the widow becomes one of the closest of Ego’s preferred brides. Ma. An example kind are not so common these days for the above-mentioned reason, but their opposite, i.e. marriage with a widow from the same generation (the levirate), is popular. To illustrate this from figure 2: If Dominggus KalaBali were to die, it would be in accordance with common practice of Dominggus’ younger brother to marry the widow, Albertina Su KalaLooew. It should be noted that this option is not open to Dominggus’ elder brother. This prohibition is evident from the various terms of address which both brothers use with respect to their sister-in-law, Albertina. While the youngest addressed her as ‘temem kyan’ (‘little mother’), the oldest addresses her as ‘tegnemuk’ (‘younger brother’s wife’). To be precise, the version

Figure 2. A five-way alliance segment over 3 generations.
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of the levirate which the Mol observe is thus the junior levirate. The difference which it implies with regard to acceptable marriage partners is also to be found in the difference between the widow of the father's younger brother and the widow of the father's older brother. The latter is addressed as 'lewip (father's older brother's wife).

We have seen that the term 'little mother' applies to a variety of different appearances. It is now clearer how they support an alliance by following in 'mother's footsteps. This is also emphasized by the synonyms 'substitution' or 'continuation marriage' which are sometimes used with reference to matrilateral cross-cousin marriage. At the same time, however, we have seen the flexibility of the Mol's application of this principle of 'substitution' or 'continuation'. The factors which play a role here are apparently also detectable in the field of the terminology of address. Categories like 'tigermuk' and 'tewip' are prohibited marriage partners for Ego. This complicates the realization of desired marriages even more. It is true that Ego has preferred marriage partners in no less than three generations, but at the same time the extent of this group is limited. This tension will be developed later when we set the Mol system of address in a broader framework. Before doing so, however, a number of structural features of the actual marriage alliances warrant some attention.

4. Symmetry and asymmetry

If we consider figures 1 and 2, we may wonder whether the kin group C is allowed to give its women in marriage to the kin group A. This would create the cycle in Figure 3:

\[
A \longrightarrow B \longrightarrow C \longrightarrow D
\]

However, such a cycle would lead to a problem with marriage gifts. This is because the asymmetry that is materialized in the circulation of women as wives is also propagated in the circulation of valuable which replace them. For instance, the marriage of Domingus Kalalo in figure 2 is accompanied by the transfer of marriage gifts, which Domingus's kin group receives in turn for the giving of Maria in marriage to Hermanus Kalaole. Every time that a new episode in the circulation of gifts occurs for Domingus, he calls upon his brother-in-law Hermanus. In this way Hermanus comes to occupy a 'wife-taking' position, even though indirectly, with respect to Su Kalalo. This prevents Mill Kalaole from acting as a wife-giver with respect to Su Kalalo in the same time, because this would lead to a symmetry of gifts between the two groups. On the other hand, this problem does not occur where four kin groups are involved in a cycle. The minimal circulation of wives (and gifts in the opposite direction) thus concerns the chain

\[
A \longrightarrow B \longrightarrow C \longrightarrow D
\]

as illustrated in Figure 3. To give the reader an idea of how such a cycle can proliferate, A and C are also involved in the chains.

\[
A \longrightarrow E \longrightarrow C \longrightarrow D \longrightarrow A
\]

\[
A \longrightarrow E \longrightarrow F \longrightarrow G \longrightarrow A
\]

Such cycles often extend further than four kin groups, and go beyond local boundaries. At varying rates they spread through the whole of the Mol territory, and sometimes have branches in neighbouring ethnic groups. In other words, the circulation of wives is the principle of integration of Mol society per excellence.

This conclusion is also based on the fact that the transfer of a woman leads to the activation of plural local and interlocal gift circuits.

A second structural aspect of the marriage alliances concerns the way in which the cycles interlock. While minimal circulation was stressed above, we now indicate a certain pattern in their circulation with one another. While bearing the principle of symmetry in mind, it is not permissible to marry into an arbitrarily selected kin group. The configuration of alliances which is formed by a number of groups excludes certain other segments. The result is that a cycle is structured by another cycle to a certain degree. For instance, it is not permissible for C and F (in Figure 3) to engage in marriage exchange. They are both wife-takers with respect to E and are thus partners in the accumulation of marriage gifts to be transferred to E. If C were to give a wife to F, or vice versa, their partnership would be put to the test by the contradictory interests. The same applies when two kin groups function simultaneously as wife-giver to a third group but marry with one another too. Let us take D and G, which are both wife-givers in respect of A. If G were to take a wife from A, B and G should be partners, but in fact they are opposed to one another as wife-takers and wife-givers respectively. There is no need to point out that such problems of loyalty are even more prominent if two kin groups, such as B and E, take part in a marriage alliance while they share both the same wife-giver (A) and wife-taker (C). In short, as the cycles of alliance become more intermeshed, the number of mutual marriage prohibitions increases to ensure a diffuse circulation of marriage gifts. If these prohibitions were not there, the gifts would 'rotate' too much within restricted circuits and lead to the creation of symmetrical relations between givers and takers. Such a symmetry has a stagnatory effect on the asymmetrical circulation of gifts that is propagated. The cycle in Figure 3 can then be reduced to

\[
A \longrightarrow (B,E) \longrightarrow (C,F) \longrightarrow (D,G) \longrightarrow A
\]

In this reduced cycle, the bracketed kin groups behave as units in the circulation of wives. In view of the freedom of choice in the formation of alliances, these units are only temporary associations. Their composition shifts depending on changes in the circuit resulting from the entry or exit of other kin groups.

A striking phenomenon can be noted in the circulation of wives when a wife is 'hauling back'. This concerns a structural feature of the marriage alliances which gives an interesting turn to the relation between symmetry and asymmetry. Time and again the Mol demonstrated how much importance they attach to an asymmetrical circulation of wives and marriage gifts. Nevertheless, there is also a tendency to realize an alliance option after a few generations which has the opposite result. In other words, the asymmetry within generations turns out to be a symmetry between generations. It is necessary to go into this case in more detail. As we have seen, the chain

\[
A \longrightarrow B \longrightarrow C \longrightarrow D
\]

A represents the minimal length of a wife circuit. Let us assume that the number of wives involved is also minimal. In that case, one wife is transferred in each generation. In figure 4, it is the mother's mother (MoMo), mother (Mo), sister (Si) and sister's daughter (SiDa) who are the connecting links. In terms of address (Ego speaking), the cycle is as follows: 'tabugaur' (A) - 'tatek' (B) - 'tatekei' (C) - 'toso' (D) - 'tabugaur' (A). The
Marriage alliance among the Moi of Irian Jaya

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Figure 4 correspond to this if the kin groups C and D engage in asymmetrical exchange in the fourth descending generation. This time C does not give a wife to D, as was the case with Si, but C takes a wife from D. At that moment 'enough trees have been passed' ('milik ook leino so'). If A and B also engage in an exchange of this kind in the same tempo, the result will be the cycle

A -- D -- C -- B -- A

This is again asymmetrical, but symmetrical in relation to the original cycle.

Naturally enough, the 'hauling back' of a wife is reflected in the terminology of address. Wife-givers and wife-takers change places. Figure 4 illustrates the resulting shifts. In this connection it is a salient detail that one of the terms of address which Ego may use for his sister's son (a) and his sister's son's son (b) is 'tecokwil kyan' ('little uncle'), without the suffix 'kyam' ('little'), this term as well as the commoner synonym 'tegak' ('uncle'), is used for the givers of Mo. This seems to contradict the fact that (a) and (b) belong to the takers of Si (tegak) and thus, according to the propagated asymmetry, cannot accommodate any 'uncles'. Probably this is a relation like that between 'mother' and 'little mother'. As 'little mother' embodies the direct asymmetrical continuation of a marriage alliance, 'little uncle' may be seen to embody an indirect symmetrical continuation of a marriage alliance. He is, in fact, the precursor of a symmetrical turn which his kin group (D) eventually accomplishes with respect to its previous wife-givers (C). Figure 4 thus shows how the 'little uncles' of today become the genuine 'uncles' of tomorrow.

S. 'Elementary' and 'complex'

At the end of the third section we saw a conflict between the realization of preferred marriages and the terminology of address. Perhaps the informed reader already had suspicions about the reason for this. Moi society follows the so-called Omaha classificatory system. Although this label is used to cover a number of variants, and opinions differ on its precise delimitation, the 'principle of the unity of the lineage' which Radcliffe-Brown (1905:330) put forward as the explanation of Omaha systems is at any rate applicable to Moi society. Lounsbury (1964:354) explains the effect of this principle as follows:

'[...] the members of a corporate unilinear descent group, though differentiated in status when seen from a vantage point within the lineage group, tend to present a unity, undifferentiated, when seen from without. Thus kinism of one sex who belong to one such lineage group which is not ego's should all stand in the same kind of status relation to ego and should be expected to receive a common kin-term designation.'

It is certainly true that terms like 'tabugaun, tegak' and 'tecmem kyam' seem to present an undifferentiated unity. It is thus tempting to regard the matrilateral cross-cousin marriage and the Omaha system as complementary. The data presented in the second section often made this temptation strong to me when I was in the field. Afterwards, however, certain research results did not seem to fit in with the supposition of complementarity. We have already drawn attention to the bilateral merging in the generation of Ego's grandparents and so the distinction with respect to suitability for marriage in the category of potential wives. Besides, it is difficult in this connection to explain the symmetrical turn between two kin groups. Be that as it may, no attempt will be made to adopt a definitive viewpoint here. Nevertheless, it is worth concluding by throwing some light on the conflict mentioned above by using the concepts of 'elementary' and 'complex'.

According to Lévi-Strauss, there is a fundamental difference between matrilateral cross-cousin marriage and the Omaha system. In general terms, the difference lies in the fact that

'an asymmetrical system operates to change kin into affines, contrary to a [...]Omaha system, which operates to change affines into kin' (Lévi-Strauss 1969:2002).
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He goes on to claim that this results in opposite effects: in the first case the continuation of marriage alliances between close kin and in the second case the mutual exclusion of alliance and kinship. Let us take another look at figure 1 from this perspective. It reveals how revelation of the mother’s brother’s daughter leads to transformation of the matrilineal consanguineal kin into affines. The opposite takes place in the terminology of address. For instance, father’s sister’s husband is addressed as ‘tebok’ (‘older brother’), i.e., this affine is consanguineal kin. Levi-Strauss believes that this fact is irreconcilable with the alliance concerned. This is not the place to go further into this question, but we can at least recognize that what we are dealing with is a complication which makes the realization of preferred marriages more difficult and which stimulates flexibility in alliance. This flexibility, which is such a distinguishing feature of Omaha systems, keeps the circulation of wives among the Moli.

In a continual state of turmoil which places it in contrast with the ideal model of an asymmetrical system in which the exchange mechanism is regularly ordered" (Levi-Strauss 1969:23000).

In other words, the ‘elementary’ character of the asymmetrical alliance favours the continuation of existing alliances, while the ‘complex’ character of the terms of address leads to a diffuseness in relations of alliance. In short,

'[...] Omaha systems provide the connecting link between elementary and complex structures' (Levi Strauss 1969:23000).

The following question concerns the nature of this connecting link. Levi-Strauss points in this connection to history, which 'finds its way into elementary structures' (Levi-Strauss 1969:XLIII). Seen in this light, the freedom of choice in the formation of marriage alliances and the consequent flexibility in the circulation of wives among the Moli would be products of 'random' historical processes. There is no need to accept such an unsatisfactory conclusion, however. In a later phase we can connect the marriage alliances with other forms of alliance which give Moli society an 'elementary' character, particularly the circulation of ceremonial exchange goods. It will then be clear that in all respects, exchange is the great stabilizing factor in the relationships between individuals and between groups' (Van der Leeden 1966:139).

Endnotes

1 Reprinted with permission of the Royal Institute of Linguistics and Anthropology, Leiden (The Netherlands), Published in Bijdragen 14(4)1988, pp. 444-477.

2 Paul Haenen is a graduate of the University of Nijmegen. His interests include the cultural anthropology of New Guinea. He is writing a thesis on exchange systems amongst the Moli of the Bird’s Head area of Irian Jaya, Drs. Haenen may be contacted at the Centre for Australian and Oceanic Studies, P.O. Box 9108, 6500 HK Nijmegen, The Netherlands.

3 The author carried out fieldwork among the Moli on the West coast of the Bird’s Head in Irian Jaya, Indonesia, for 18 months during 1964/5. Thanks to a grant from the Indonesian studies Programme (Leiden, the Netherlands), he was able to conduct research on the prestige economy of this society, about which little is known apart from a few reports by Dutch administrators and missionaries.

I would like to thank Lex van der Leeden, Jan Pouwer, Willem Rasing and Albert Trouwborst for their informed comments on an earlier version of this article. I would also like to thank Peter Mason for the English translation.

4 Moli terms are cited in italics. The orthography corresponds to that of Bahasa Indonesia, the lingua franca of Irian Jaya.

5 In what follows, Ego should be understood to be ‘male speaking’ unless otherwise indicated.
AGRICULTURE, SOIL, AND CLIMATE IN IRIAN JAYA

Dr. Patrick Hynes
United Nations Joint Development Project

BACKGROUND

Agriculture in Irian Jaya is conditioned by the prevailing climate and its physical characteristics. The weather patterns are equatorial with little variation in temperature and humidity. A central spine of mountains rising to 4000 m has a modifying effect on temperature, producing a range of agro-ecological zones. The occurrence of ridges and peaks causes local variation in wind speed, frost pockets and rain shadow. Without an adequate frequency of weather stations caution should be exercised over generalizations about climate.

The effects of the Walker circulation on the reversal of the Trans-Pacific circulation, the 'El Niño' event occurring with a 10 year periodicity in its frequency, causes periods of 3-4 months of significantly lower rainfall and increased frost risk. The prolonged dry spells associated with these events are particularly disruptive in the highlands where reliance is made on continuous production to maintain food supply rather than on a strategy of food storage.

Climate is strongly modified by the topography, creating characteristic ecological zones. Within the highlands are a series of montane valleys, separated by mountains and many extinct strato-volcanoes. These valley floors are flat to rolling and lie between 1,500 and 1,600 m above sea level. Tectonic movement and vulcanism have resulted in material deposition causing the disruption of drainage patterns creating large swamps, limestone plateaux, lakebed sediments, overwash fans, colluvium and narrow flood plains.

Other features include swampy, clayey and peaty alluvial plains in much of southern Irian Jaya. These are flat to lowlying (0-100 m) and are often flooded. Away from these flats, the land is made up of gravelly alluvial fans which produce terraces of impoverished soil. The northern coastal plain is generally narrow, but widens substantially at the swampy Mamberamo delta.

Much of the land resources of Irian Jaya are highly variable. Equally variable are the people who use these resources for agriculture. There are over 224 distinct language groups, each with unique traditions and values. Many of these groups have only recently experienced contact with the outside world and are undergoing rapid, profound changes. This combination of physical and cultural diversity indicates a wide range of traditional farming systems.

For agricultural purposes two main systems may be identified as highland and lowland. Each of these are made up of subsystems which are not thought to require separate treatment. In summary there are:
Lowlands
(i) Coastal, swamps and rivers,
(ii) Coastal plains and
(iii) Foothills and small valleys.

Highlands
(i) Broad valleys,
(ii) Lakeshore plains, and
(iii) Hill slopes in narrow valleys.

II. AGRICULTURAL SYSTEMS

A. Lowlands

Coastal, Swamps and Rivers
Settlements in this zone usually have easy access to river and ocean transport, but are frequently quite isolated and underdeveloped. A major proportion of subsistence comes from hunting and gathering with sago providing the central dietary staple. In some areas existing sago swamps may sustain regular exploitations, in others it is cultivated by planting suckers for harvest in 10-15 year cycles. Tuber gardens are rare and usually cultivated on raised mounds. Families may work small home garden plots of vegetables or perennials such as coconuts, bananas or papayas. Diet is supplemented by catches of fish, crustaceans and sometimes turtle.

There is often a clear division of labor by sex with men doing most of the hunting and gathering and the felling of sago. The extraction and preparation of the starch are the responsibility of women.

The extent of wild and cultivated sago in Irian Jaya is variously estimated at between 275,000 ha and 350,000 ha. The major sago concentration is found at the west/southwest part of kabupaten Merauke.

Coastal Plains - North and South Coast differences
Apart from coconuts on coastal plains, this zone is cultivated using a swidden system of shifting cultivation. The land is cleared of trees, burnt and planted with mixed crops. The length of cropping period varies with original cover and soil type but rarely exceeds two to three years. This is followed by a fallow period, the duration of which is determined by the mix of species and their size. This coincides with a lapse of 10 to 20 years but is not time-fixed as many observers suppose. Given periods of sufficient duration the shifting cultivation system is capable of sustaining crop production. It is also more efficient in the use of time than intensive cultivation systems. Production is mainly concerned with mixed gardening and pig rearing supplemented by seasonal gathering and some hunting.

In many of these swidden systems, the men carry out the heavy work of clearing the fields and building the fences to keep out feral pigs and deer, while women are responsible for crop production and pig rearing. This latter is a central feature of these societies where the pig assumes a major role in prestations which are important in maintaining community bonds.

Limited plantation cropping is done in the coastal lowlands by the state-owned tree crop estate companies, oil palm at Arso near Jayapura, oil palm and cocoa in Manokwari. Other tree crops are privately owned, these include 1,000 ha cocoa at Ransiki, 243 ha cocoa, and 357 ha hybrid coconuts on Pitalu Adi, in addition private entrepreneurs produce cloves.

On the north coast cassava is in general use as a source of dietary carbohydrate with a lower reliance on sweet potato. In the Bird's Head area, and parts of Cenderawasih Bay, taro with yam are the main staples. Mixed stands of fruit perennials are a feature of household gardens in the area. In contrast, on the south coast sago is more widely used.

Foothills and Small Valleys
Foothills and small valleys occur at elevations of about 100 - 1,000 m. The area south of the central spine of mountains being somewhat narrower than that on the northern slopes. The soil material is colluvial with limestone and higher content of basaltic and oceanic material in the north. In this area population is sparse, being made up of shifting cultivators and peat gatherers.

B. Highlands

Broad Valleys
These areas include the Baliem valley and similar intermontane valleys in the Central Mountain Range in the Papua New Guinea highlight the influence of pig populations in the ecosystem. With a pig to person ratio of 1:5 in the Chimbu, Brookfield and Brown (1963) report that 15-23 percent of a garden in full production is consumed by pigs during a low state in the pig cycle, and as much as 40 percent during the peak of production.

The intensive forms of sweet potato gardening practised by the Dani in Baliem are recognized as excellent with sound methods of fertility management. These systems are also interesting as they represent conscious modification of the ecosystem to ensure production on a sustained basis. However, increasing population levels have caused cultivation to spread up the steep valley sides. Cultivation of steep land and short fallow periods have led to a breakdown of traditional practices resulting in declining soil fertility, erosion and excessive deforestation.

Lakeshore Plains
Agriculture on the lakeshore plains and infilled lake beds differs in several respects from that in the broad valleys. The broad valleys have few peat soils, the lakeshores have mainly peat. Both areas have drainage problems, but these are a greater constraint on the lakeshore plains. Trace element deficiencies are more marked in the waterlogged soils of the lakeshores.

The people of the lakeshore plains are more independent (work less in groups) and are more familiar with a market economy than people in the broad valleys. In the east, Lakeshore people are fishermen as well as sweet potato gardeners and pig raisers. Furthermore, over the last decade or so have developed a strong interest in coffee cash cropping.

Hilledales in Narrow Valleys
According to the sensitivity and resilience of the soil, stable systems and degraded systems occur. In these discussion the definitions used by Holling (1978) are applied. Resilience is a property that allows a system to absorb and utilize change, while sensitivity is the degree to which a given land system changes due to natural forces following human interference.

In some highland valleys where soils are resilient and irrespective of their sensitivity a stable sweet potato based system has been evolved with soil protection provided by cross barriers and soil cover with Casuarina or Albizia trees. Evidence of this can be seen on the lower slopes at Paiton where the ecosystem has been successfully modified. These lands are dedicated to sweet potato, which is cultivated on a basis of strict rotation.
On adjacent areas of easily sensitive land, but with low resilience, attempts at shifting cultivation have resulted in rapid degradation. It is likely that such degradation may not be entirely related to a shortening of the fallow period but to a sudden and disastrous loss of soil.

The establishment of a sustainable system of cropping, on the more resilient soils in the area, could improve their productivity, and by the same token remove the pressure to farm in more sensitive areas.

III. CURRENT PRODUCTION

A. Crops

Foodcrops, Vegetables and Fruit

Production statistics for crops in Irian Jaya are given separately for food crops and tree crops. However, food crops include fruit. The evaluation of food crop production in 1987 is given in Table 1 below.

Table 1 Production of Foodcrops, Vegetables and Fruit (in tons) 1990-1987

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</thead>
<tbody>
<tr>
<td>Rice*</td>
<td>4,487</td>
<td>6,194</td>
<td>7,300</td>
<td>12,984</td>
<td>25,574</td>
<td>34,785</td>
<td>40,851</td>
<td>40,055</td>
</tr>
<tr>
<td>Maize*</td>
<td>2,023</td>
<td>3,329</td>
<td>3,845</td>
<td>3,075</td>
<td>2,742</td>
<td>3,311</td>
<td>4,296</td>
<td>5,003</td>
</tr>
<tr>
<td>Soybean*</td>
<td>1,715</td>
<td>1,737</td>
<td>1,349</td>
<td>2,614</td>
<td>2,435</td>
<td>4,112</td>
<td>5,042</td>
<td>7,580</td>
</tr>
<tr>
<td>Peanuts*</td>
<td>1,763</td>
<td>1,466</td>
<td>1,346</td>
<td>1,954</td>
<td>1,169</td>
<td>1,966</td>
<td>2,359</td>
<td>2,423</td>
</tr>
<tr>
<td>Mungbean*</td>
<td>217</td>
<td>172</td>
<td>168</td>
<td>504</td>
<td>477</td>
<td>529</td>
<td>621</td>
<td>920</td>
</tr>
<tr>
<td>Cassava*</td>
<td>27,512</td>
<td>54,119</td>
<td>31,780</td>
<td>53,479</td>
<td>35,779</td>
<td>25,879</td>
<td>22,060</td>
<td>26,742</td>
</tr>
<tr>
<td>Sweet potato+</td>
<td>333,451</td>
<td>320,554</td>
<td>207,956</td>
<td>387,268</td>
<td>333,046</td>
<td>351,614</td>
<td>238,757</td>
<td>226,379</td>
</tr>
<tr>
<td>Vegetables</td>
<td>12,845</td>
<td>13,065</td>
<td>18,288</td>
<td>20,107</td>
<td>17,792</td>
<td>26,399</td>
<td>25,808</td>
<td>31,767</td>
</tr>
<tr>
<td>+</td>
<td>12,320</td>
<td>22,917</td>
<td>27,580</td>
<td>27,045</td>
<td>19,181</td>
<td>25,094</td>
<td>25,094</td>
<td>25,738</td>
</tr>
</tbody>
</table>

Source: Dinas Tanaman Pangan Jayapura

* Dry seed at approximately 10% moisture
+ Fresh weight as harvested

Commodity Crops

Table 2 Production of Estate Crops in tons 1979-1988

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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coconuts</td>
<td>10,799</td>
<td>9,275</td>
<td>7,574</td>
<td>9,246</td>
<td>6,394</td>
<td>7,029</td>
<td>6,738</td>
<td>10,247</td>
<td>9,742</td>
</tr>
<tr>
<td>Nutmeg</td>
<td>1,341</td>
<td>4,322</td>
<td>1,948</td>
<td>1,548</td>
<td>895</td>
<td>1,169</td>
<td>952</td>
<td>970</td>
<td>987</td>
</tr>
<tr>
<td>Cocoa</td>
<td>149</td>
<td>102</td>
<td>102</td>
<td>104</td>
<td>104</td>
<td>145</td>
<td>243</td>
<td>287</td>
<td>713</td>
</tr>
<tr>
<td>Coffee</td>
<td>6</td>
<td>36</td>
<td>36</td>
<td>39</td>
<td>45</td>
<td>51</td>
<td>47</td>
<td>139</td>
<td>37</td>
</tr>
<tr>
<td>Kapok</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>41</td>
<td>55</td>
<td>67</td>
<td>80</td>
<td>66</td>
</tr>
<tr>
<td>Rubber</td>
<td>279</td>
<td>282</td>
<td>239</td>
<td>313</td>
<td>253</td>
<td>256</td>
<td>119</td>
<td>484</td>
<td>339</td>
</tr>
<tr>
<td>Cashew</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.5</td>
<td>17</td>
<td>17</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: Dinas Perkebunan Irian Jaya Province

B. Livestock

Pigs are the dominant husbanded animal in the province due to their place and status in indigenous cultural systems. In 1987, there were an estimated 353,490 pigs.

Table 3 Livestock Population in Irian Jaya

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Cow</td>
<td>9,848</td>
<td>12,522</td>
<td>15,292</td>
<td>16,093</td>
<td>18,918</td>
<td>22,405</td>
<td>24,689</td>
<td>27,064</td>
<td>32,128</td>
</tr>
<tr>
<td>Buffalo</td>
<td>30</td>
<td>34</td>
<td>224</td>
<td>203</td>
<td>223</td>
<td>312</td>
<td>355</td>
<td>375</td>
<td>529</td>
</tr>
<tr>
<td>Horse</td>
<td>2,665</td>
<td>2,745</td>
<td>2,840</td>
<td>2,552</td>
<td>2,615</td>
<td>1,735</td>
<td>1,767</td>
<td>1,841</td>
<td>1,974</td>
</tr>
<tr>
<td>Goat</td>
<td>13,362</td>
<td>14,090</td>
<td>17,003</td>
<td>19,500</td>
<td>23,446</td>
<td>31,127</td>
<td>32,807</td>
<td>34,612</td>
<td>46,767</td>
</tr>
<tr>
<td>Sheep</td>
<td>2,157</td>
<td>2,606</td>
<td>1,852</td>
<td>1,444</td>
<td>1,172</td>
<td>1,087</td>
<td>1,144</td>
<td>1,201</td>
<td>1,120</td>
</tr>
<tr>
<td>Pig</td>
<td>355,506</td>
<td>356,000</td>
<td>352,475</td>
<td>366,304</td>
<td>488,573</td>
<td>505,860</td>
<td>519,312</td>
<td>588,547</td>
<td>608,608</td>
</tr>
<tr>
<td>Village</td>
<td>430,491</td>
<td>556,194</td>
<td>481,883</td>
<td>487,000</td>
<td>502,262</td>
<td>603,453</td>
<td>613,099</td>
<td>625,760</td>
<td>744,240</td>
</tr>
<tr>
<td>Chicken</td>
<td>Layers</td>
<td>85,438</td>
<td>93,725</td>
<td>155,619</td>
<td>172,200</td>
<td>174,908</td>
<td>195,464</td>
<td>206,078</td>
<td>235,150</td>
</tr>
<tr>
<td>Duck</td>
<td>22,207</td>
<td>23,700</td>
<td>17,565</td>
<td>18,860</td>
<td>19,594</td>
<td>21,190</td>
<td>21,548</td>
<td>22,590</td>
<td>24,440</td>
</tr>
<tr>
<td>Emu</td>
<td>26,116</td>
<td>27,300</td>
<td>22,290</td>
<td>30,060</td>
<td>28,245</td>
<td>31,957</td>
<td>34,182</td>
<td>35,840</td>
<td>40,604</td>
</tr>
<tr>
<td>Rabbit</td>
<td>146</td>
<td>115</td>
<td>10,600</td>
<td>13,200</td>
<td>15,712</td>
<td>17,500</td>
<td>17,850</td>
<td>18,560</td>
<td>19,298</td>
</tr>
</tbody>
</table>

Source: Dinas Peternakan Irian Jaya Province (Livestock).

Cattle and buffalo. There are an estimated 27,260 head of beef cattle, 135 dairy cattle and 405 water buffalo. Apart from beef production about 10 percent of the cattle population is used for draught purposes.

Ball cattle (Bos balus) are highly successful while Brahman and other Bos indicus crosses have a theoretical superiority in drier areas, they have lower growth and calving rates. Ball cattle are a good dual purpose animal being useful for meat and draught. Small herds of Friesians introduced by missionaries at Sentani and Moanamani have been less successful.

Since Ball cattle are dual purpose and are more versatile than buffalo for draught except under very wet conditions, there is only significant use of buffalo in the swampland areas of Sorong.

Goat and Sheep. Estimates for 1967 put the goat population at 34,595 and sheep at 1,201.

Poultry and Water Fowl. These are estimated at 1.7 million poultry about half of which are battery broiler and 13 percent battery layers. Water fowl are estimated to be 86,430. The native chicken, ayam kampong is considered to have a better flavor than battery broilers and are generally more resistant to disease. Among battery chicken, broilers are the most common but despite local production some 694,784 birds were imported in 1987 indicating an unsatisfied demand of around 1.2 million kg of poultry meat.

Waterfowl are well adapted to the large areas of swampland or seasonally flooded areas in the Province. Although the demand for duck meat is limited, the eggs command a good price.
Rabbits. The rabbit population in 1987 is estimated at 18,560. Three quarters of which are located in the highlands. In the higher lowland temperatures rabbit cultivation has been less successful. However, good growth rates have been achieved in the cooler highlands. Rabbits are believed to provide a workable solution to the shortage of protein in the diet. Doubts have however been expressed over the suitability of any form of livestock which is unable to subsist without recourse to foraging. This gives emphasis to the need for a progressive approach to the further introduction of livestock in farm production, based on careful training and motivation.

Bees. Honey production in the highlands is considered to have good potential. Production from Wamena is estimated at 7,000 liters per year, a proportion of which is cultivated and some is gathered from wild hives.

Deer. It is estimated that the Okaba and Rawa Biru areas of Merauke district contain the largest herds of Red Deer (Cervus timorensis) in the world. There are additional significant resources in small valleys in the Sentani area of the district of Jayapura and in the Birds Head area. The population in southern Irian Jaya is estimated to be in excess of 350,000 animals, about 25,000 of which are illegally killed each year. It has been suggested that the ban on hunting these animals be lifted and a system of controlled exploitation established, with provisions for participation by the indigenous people on whose traditional lands the deer live.

Table 4 Poultry and small livestock production 1987

<table>
<thead>
<tr>
<th>Type</th>
<th>Population (head)</th>
<th>Households involved (head)</th>
<th>Production (ton)</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local chicken</td>
<td>623,337</td>
<td>15,404</td>
<td>1,644</td>
<td>327</td>
</tr>
<tr>
<td>Commercial layers</td>
<td>265,067</td>
<td>140,000</td>
<td>1,661</td>
<td>578</td>
</tr>
<tr>
<td>Broilers</td>
<td>35,839</td>
<td>41</td>
<td>162</td>
<td>41</td>
</tr>
<tr>
<td>Muscovy ducks</td>
<td>22,589</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rabbits</td>
<td>18,560</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

soybeans (1000 tons); and mungbeans (22 tons) (see Table 3). Local shortages of various other commodities including cooking oil have also been reported. Current projections by provincial authorities are that deficits in basic food commodities will increase during REPELITA V (five year plan) if steps are not taken to increase output for the local market.

Market prices for basic food commodities in district capitals are generally low as a result of Dolog interventions and this serves to suppress local production for the market (see Table 4). Prevailing and projected market prices for several estate crops are favorable (especially for coffee, rubber, cardamom, pepper, nutmeg, and cashew - see Table 2) and provide an adequate price to stimulate production. The government is intervening in the market system through provision of subsidies of transport costs. Subsidized freight costs on commodities flown from the highlands to urban markets have encouraged output of highland vegetables and coffee. There is a need to review the province's program of price, transport and input subsidies in order to establish a price structure for the agricultural sector with minimum subsidies.

Irian Jaya is endowed with extensive land resources suitable for agricultural use, and there is potential for both intensification as well as extensification of cropping. There is the potential to achieve self-sufficiency in food commodities for the local market. There is also significant potential to increase supply to international and Indonesian markets of several commodities. For the highland areas these commodities include arabica coffee, cardamom, honey and garlic. For the lowlands the commodities indicated are nutmeg/mace, rubber, pepper, and cashew. A review of potential returns to farmers indicates that cultivation offers the potential to increase incomes (see Table 1 Annex 8 RePPrott).

The size of the province, its low population density, and the high cost of internal transportation results in poor terms of trade for rural producers. The cost of inputs for agriculture are relatively high at farmgate compared with all other areas of Indonesia. The terms of trade for the rural population of the highlands are especially poor given the high transport cost of freight to and from the highlands (see Table 3). The airports in the highlands are located at market centers which provide services to areas which are 100-150 kilometers within which inputs and products are carried by the local people. For the lowland coastal areas which have access to coastal shipping services, freight costs are significantly lower than the highlands average cost of $100-150/kg to principal provincial ports. In order to improve the competitive market position of the traditional sector, public investments are required to reduce costs of transport.

Many of the indigenous people of the province lack experience in the market economy and live in accordance with traditional systems of hunting, gathering, subsistence agriculture, and bartering. Involvement in the market economy for these local people is limited to sales of small surpluses (coffee, vegetables, fruits, artesanil work, firewood and chickens) to local traders or to local markets and traders. Some individuals trade implements, cloth, etc. The transition from a subsistence economy to a market economy is being made through interaction with local traders, NGO's, village kiosks, and service center markets. The rate of transition varies among the ethnic groups and within each community, educational levels, physical access, etc. In a recent village survey, it was recorded that the average level of commodities sold by a typical rural family of the highlands was Rp 44,000 per month in villages where coffee is not grown and Rp 68,000 in more progressive villages where coffee and handicrafts are being produced for the market. Faced with this situation, the government and NGOs have initiated various programs to better integrate the indigenous people with the market economy as a method to improve rural incomes and welfare. However, additional assistance is required to support these efforts, including training in post-harvest technology and basic marketing practices.

Six types of institutions are involved in marketing in the province. They are private companies, individual commodity traders, cooperatives, NGOs, parastatal marketing bodies and the government. For marketing of commodities other than those from the enclave industries, the private sector marketing systems are at a pioneer state of development where a limited number of buyers operate in imperfect markets. Cooperatives are also at an early stage of development and lack managerial expertise and acceptance among the local people. NGOs have entered marketing activities as a method to improve welfare levels of the rural people, but their long-term role in marketing is not clearly defined. Parastatal organizations such as have also entered into marketing operations for such commodities as rubber and cocoa. The government has entered into various forms of subsidy activities to improve supply of inputs
and marketing of products, but the ability of the government to continue to subsidize marketing arrangements is limited and the government's objectives with regard to subsidies is not clearly defined. An immediate priority for the province is the formulation of a more comprehensive program of assistance for private, cooperative, and non-government organizations involved in marketing within the traditional sector. There is also a need to critically review and reformulate the current structure of subsidies for transport within the province in order to develop an efficient production and marketing system in accordance with market forces.

Various consultants have examined the current status of development of the marketing systems for various commodities in Irian Jaya (see PPPP reports by Swisher, Quane, Gardiner, and the UORD). There is a general consensus among these reports that development of the province's systems for production, transport, and marketing should be supported within a comprehensive development strategy. Among the components of this strategy which would be supported through the project are the following:

(a) Market Structure and Provincial Policies

The project would provide technical assistance to provincial authorities to formulate improved policies and programs for marketing for the traditional sector. The assistance will focus on defining initiatives to better assist private, cooperative, and NGO organizations involved in marketing and defining policies to minimize transport subsidies. Possible initiatives to be evaluated would include training, credits, and other support services. Policies and programs would be made with the goal of improving the efficiency of the province's marketing system.

(b) Improvement of Transportation Systems

Transportation facilities would be improved to provide lower cost access to markets. In the highlands, this would be accomplished through improvement of airfields, rural trails, bridges, and secondary roads. In the lowland, coastal zones, the project would support improvement of riverine and coastal transport (boats and docks) and improvement of trails and access roads.

(c) Local Self-Sufficiency for Food

Projects would be undertaken to support local self-sufficiency in basic food crops, fruits, fish and livestock. The goal of these project interventions would be to ensure local food security, reduce the need for the province to import basic commodities, and eliminate diseconomies from transport of commodities with relatively low unit cost. Activities to be supported under the project would include production and distribution of improved seed material for food crops, distribution of livestock, demonstrations of improved cultivation systems and animal husbandry practices, and introduction of appropriate post-harvest technology for primary processing and storage of food commodities.

(d) Expansion of Production of Agricultural Products for Export

The project would support various activities to support the expansion of production of commodities for export on a selective basis in line with the marketing constraints. Due to the high costs of transport within the province, emphasis would be placed on expansion of production of crops which require minimum inputs and which have high unit values. For the highlands, application of these criteria indicates that production of coffee (arabica), cardamom, honey, and garlic should be encouraged through various types of project interventions. For the lowlands, project support for expansion of production of crops such as nutmeg, rubber, cashews, and pepper would be provided. Project support would also be provided for support of introduction of post-harvest technology for primary processing and storage at the local level.

(e) Training Programs for Local People, NGO Personnel and Government field Workers

The project would support training programs for village motivators, community development workers, and agricultural extension workers on marketing and planning of activities/local initiatives along market lines. The project would also support training programs for the local people to provide guidance on farming practices, post-harvest technology and an orientation to market systems.

(f) Local Market Centers

The project would support establishment of intermediate markets at the sub-district level as part of the program of local initiatives. The intermediate markets would be a center for farmers to sell their produce and to procure basic needs.

V. CLIMATE AND SOILS IN IRIAN JAYA

INTRODUCTION

Six broad ecological zones have been identified as rural development areas (Figure A3.14). These include local variations in climate and soil which deserve description. Use is made of the physiographic regions and such regions in RAPPProT to identify the different climates and soils in each zone. This relationship is summarized in Table 8.

Coastal Swamps and Rivers

The physiographic zones in which these occur include: the Southern Coastal Plains, the Bintuni Bay Lowlands and the Northern Coastal Plains. The relevant sub-regions on which the descriptions of climate and soil are based are shown in Table 7.

Climate

A summary of climatic data for the component areas of this zone are given below.

<table>
<thead>
<tr>
<th>Table 7</th>
<th>Merauke</th>
<th>Tanah Merah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinates &amp; Elevation</td>
<td>06°31'S-140°25'E</td>
<td>06°05'S-140°15'E</td>
</tr>
<tr>
<td>Rainfall</td>
<td>Mean annual</td>
<td>1,350</td>
</tr>
<tr>
<td></td>
<td>Dry months</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Wet months</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Temperature</td>
<td>Mean Max.</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Mean Min.</td>
<td>22.2</td>
</tr>
<tr>
<td></td>
<td>Relative humidity</td>
<td>85 - 90</td>
</tr>
<tr>
<td>Wind speed m/s</td>
<td>0.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Sunshine hours</td>
<td>1,390</td>
<td>1,390</td>
</tr>
<tr>
<td>Open . evapo(estimate)</td>
<td>2,000 - 2,100</td>
<td>1,300</td>
</tr>
<tr>
<td>Crop growing seasons</td>
<td>arable tree</td>
<td>120 - 180</td>
</tr>
</tbody>
</table>

Soils

Although all coastal and riverine swamp soils have an alluvial or biogenic origin, there is a range of types according to the texture of the alluvium, the frequency and duration of inundation and flooding and the height permanence and quality of the groundwater. Typically, swamps are comprised of recent, fine to coarse-grained deposits extensively overlain by organic material. In some areas, the mineral
**Table 5 Irian Jaya Exports by Sector And Commodity Subsector, 1979 And 1986 (USS Equivalent At Current Rate of Exchange $ 000's)**

<table>
<thead>
<tr>
<th>Sector</th>
<th>1979</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Agricultural Products</td>
<td>592,642</td>
<td>271,322.4</td>
</tr>
<tr>
<td>1.1 Plantation Products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1 Mace</td>
<td>157.8</td>
<td>240.0</td>
</tr>
<tr>
<td>1.1.2 Nutmeg</td>
<td>465.8</td>
<td>765.7</td>
</tr>
<tr>
<td>1.1.3 Chocolate</td>
<td>-</td>
<td>293.0</td>
</tr>
<tr>
<td>1.1.4 Rubber (inter-island)</td>
<td>130.0</td>
<td></td>
</tr>
<tr>
<td>1.1.5 Copra (inter-island)</td>
<td>22.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>823.6</td>
<td>1,410.7</td>
</tr>
<tr>
<td>1.2 Sea Products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Shrimp</td>
<td>21,165.7</td>
<td>20,810.5</td>
</tr>
<tr>
<td>1.2.2 Tuna</td>
<td>183.4</td>
<td>54.3</td>
</tr>
<tr>
<td>1.2.3 Blad (Lola Shells)</td>
<td>20.3</td>
<td>54.4</td>
</tr>
<tr>
<td>1.2.4 Batu Laga (Laga Coral)</td>
<td>20.3</td>
<td>54.4</td>
</tr>
<tr>
<td>1.2.5 Crab</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>1.2.6 Sea Shells</td>
<td>10.5</td>
<td>399.7</td>
</tr>
<tr>
<td>1.2.7 Sea Cucumber</td>
<td>1.5</td>
<td>341.7</td>
</tr>
<tr>
<td>1.2.8 Shark Fin</td>
<td>1,906.8</td>
<td>44.6</td>
</tr>
<tr>
<td>1.2.9 Pearls</td>
<td>23.3</td>
<td>39.7</td>
</tr>
<tr>
<td>1.2.10 Green Small Shell</td>
<td>1.5</td>
<td>341.7</td>
</tr>
<tr>
<td>1.2.11 Sea Fish</td>
<td>20,305.0</td>
<td>29,865.9</td>
</tr>
<tr>
<td>1.2.12 Shark Liver Oil</td>
<td>22,928.0</td>
<td>31,276.3</td>
</tr>
<tr>
<td>1.3 Percentage of Total Exports</td>
<td>5.4%</td>
<td>11.4%</td>
</tr>
<tr>
<td>II. Forest Products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Logs/Sawmill Products</td>
<td>23,427.5</td>
<td>345.3</td>
</tr>
<tr>
<td>2.2 Resin</td>
<td>5.5</td>
<td>11.4</td>
</tr>
<tr>
<td>2.3 Rattan</td>
<td>23.3</td>
<td>399.7</td>
</tr>
<tr>
<td>2.4 Crocodile Skin</td>
<td>211.0</td>
<td>74.5</td>
</tr>
<tr>
<td></td>
<td>23,844.0</td>
<td>419.8</td>
</tr>
<tr>
<td>III. Mining Products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Copper Concentrate</td>
<td>50,535.1</td>
<td>144,543.6</td>
</tr>
<tr>
<td>4.2 Petroleum</td>
<td>308,534.5</td>
<td>335,522.5</td>
</tr>
<tr>
<td></td>
<td>449,069.6</td>
<td>240,046.1</td>
</tr>
<tr>
<td>Total 4 sectors</td>
<td>502,642</td>
<td>271,322.4</td>
</tr>
</tbody>
</table>

Note: * Source is Dinas Pekermban (Agriculture) Ti.K.I. Irian Jaya 1987. Derives from Rp value converted to USS equiv. at end year rate (Rp 1,000 = 1USS).**

**Table 6. Scheme Showing the Relationship between Agro-Ecological Zones and Physiographic Regions**

<table>
<thead>
<tr>
<th>Agro-Ecological Zone</th>
<th>Physiographic Region</th>
<th>Sub-Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lowlands</td>
<td>Coastal Swamps and Rivers</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Southern Coastal Plains (wet phases)</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Bintuni Bay Lowlands (wet phases)</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Northern Coastal Plains and Foothills (wet phases)</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Wamrai Wari Swampslands,</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Mamberamo Delta</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td>Coastal Plains</td>
<td>Northern Coastal Plains (drylands)</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Nabire Plains and Foothills</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Sarmi Sermo Plains</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Waigeo - Tamrau -</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Oratnkti - Artak Mts.</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>(coastal strip Ransiki to Sorong)</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Karar Ranges</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td>Foothills and Small</td>
<td>Valimagunth MountainRanges</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Roufussa - Gaultier - Nawa</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Mountains - Cyclops - Bonggo</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Nimboksan Mountains and Plains</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Waigeo - Tamrau -</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Oratnkti - Artak Mts.</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Terniminbuan Karst Ranges - Bintuni Bay Lowlands</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Bombera</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Bintuni Hills and Terraces</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Bombera Dissected Plains and Terraces Orosuwa Karst</td>
<td>Coastal Swamps and Rivers</td>
</tr>
<tr>
<td></td>
<td>Foothills and Fans (south of Central Mountain Range)</td>
<td>Coastal Swamps and Rivers</td>
</tr>
</tbody>
</table>

B. Highlands

<table>
<thead>
<tr>
<th>Region</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad Valleys</td>
<td>None given by RePPProT, RDA</td>
</tr>
<tr>
<td>Lakeshore Plains</td>
<td>sub-regions are as follows:</td>
</tr>
<tr>
<td></td>
<td>Grand Baliem Valley</td>
</tr>
<tr>
<td></td>
<td>Parial Lakes and River Plains</td>
</tr>
<tr>
<td></td>
<td>Hilltops in Narrow Valley</td>
</tr>
</tbody>
</table>
General Characteristics of Irian Jaya

East and West of the Digul River. This includes an extensive alluvial plain, locally submerged in the wet season, with relatively dry areas. These may have higher than average general soil fertility. However, with older alluvium of riverine origin are less fertile with the possibility of patchy potentially acid sulphate conditions, where soil is deep. Such soil could be problematic with deep rooted plants following drainage. To the west of the Digul there are deep, infertile acid peats.

Bay Swamps. Soils in this area are variable and include silty and clayey hydromorphic types. In places peat up to 1 m deep have been recorded. These latter are normally extremely acid with minor element deficiencies.

Waramo - Waram Swamps. Extremely acid, dark reddish-brown peat soils occur in swampy alluvial basins. Some are 10 m deep, but usually only about 3 m. In places deep peat is interspersed with fine textured alluvium. These are less acid with a better nutrient status.

Memberamo Delta. Soils are composed of recent alluvial deposits and superficial peaty accumulation. Beaches with sand of mixed mineralogy occur in places. There are also areas with tertiary sandstone and river mudstones.

Sarmi Sermo Plains. Soils are interspersed with areas of swampy alluvial basins, consisting of poorly drained, extremely acid, dark reddish brown peat soils. The levee soils of the major river systems are well drained, coarse to medium loams with different degrees of development stratification and base status.

Coastal Plains

The physiographic sub-regions which are included in this zone the Sarmi-Sermo Plains and the Nabire Plains. It also includes a narrow strip on the north coast of the Bird’s Head from Ransiki to Sorong and the low-lying areas of the Fak Fak Karst and Kumara Karst.

Climate

Climate data representative of those areas are summarized below.

Sarmi-Sermo Plains. Soils throughout the Sarmi-Sermo Plains on the North Coast, show a recurring sequence of distribution related to a recurring sequence of beach slope and beach alluvium complexes, separated by narrow parallel sandy swales. Some beach ridge soils are deep, with mixed mineralogy but better drainage than the intervening swale soils. In some fine drainage soils the cation exchange related fertility is low.

Nabire. The Nabire Plains consist predominantly of unconsolidated recent alluvium, derived from mountains in the interior of extremely varied lithology and mineralogy. This material is mostly of fine to medium grade with few gravel, and are locally overtarn by shallow organic accumulations. At the western extreme raised coral reef formations occur. Inland from the young alluvial deposits are mudstones, sandstones and mafic forming low hills. In some places these are covered fluvial fan deposits.

Bird’s Head (Ransiki to Sorong). These soils vary widely in chemical and physical characteristics depending on the source of parent soil material. Near to river mouths and the coast, soils derived from beach deposits and sandy ridges are freely to excessively drained. These have a weak capacity to retain nutrients, making management with chemical fertilizers untenable. Coastal plains of coalescent alluvial fans are mostly base-rich in perfectly or well drained and medium textured. Soils in swales or lagoons between successive beaches are fine-textured and poorly drained but fertile. These have potential for crop production.

South Coast/Bird’s Head. Soils in the Fak Fak lowlands are derived from limestone. In low rainfall areas this weather to montmorillonitic and illitic swelling clays. In higher rainfall limestone derived soils are strongly leached and less fertile. Less pure limestone marts, in the Fak Fak area weather a brickwork. It is covered by a fine layer of fine-loamy to fine-clayey soil with silt clay fragments. The high lime content of these soils can be expected to hinder the mobilization of trace elements.

Table 8

<table>
<thead>
<tr>
<th></th>
<th>Sarmi Sermo</th>
<th>Nabire</th>
<th>Bird's Head</th>
<th>East Coast</th>
<th>Kaimana</th>
<th>Fak Fak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude</td>
<td>00°25'S; 130°30'E</td>
<td>00°52'S; 134°05'E</td>
<td>00°36'S; 133°41'E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation</td>
<td>11</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rainfall</td>
<td>3,600 - 4,000</td>
<td>3,766</td>
<td>3,000 - 4,000</td>
<td>1500</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Range</td>
<td>(1791 at Arad)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet months</td>
<td>12</td>
<td>9</td>
<td>9 - 12</td>
<td>3 - 9</td>
<td>3 - 9</td>
<td>5 - 9</td>
</tr>
<tr>
<td>Temperature</td>
<td>Mean Max.</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Mean Min.</td>
<td>23</td>
<td>23</td>
<td>23 - 25</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>80 - 95</td>
<td>85 - 90</td>
<td>85 - 90</td>
<td>85 - 90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind speed</td>
<td>1 - 1.7</td>
<td>1 - 1.7</td>
<td>1 - 3</td>
<td>1 - 3 April</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td>1,715</td>
<td>2,190</td>
<td>1,825</td>
<td>1,850</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunshine</td>
<td>2,000</td>
<td>2,000</td>
<td>1,800 - 2,000</td>
<td>1,900 - 2,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penman</td>
<td>1365</td>
<td>1610</td>
<td>1450 - 1600</td>
<td>1550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture deficit</td>
<td>80</td>
<td>30</td>
<td>80</td>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arable crops</td>
<td>55</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Crops</td>
<td>80</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay</td>
<td>300 - 365</td>
<td>300 - 365</td>
<td>Arable 200 - 300</td>
<td>210</td>
<td>240</td>
<td>330 - 365</td>
</tr>
<tr>
<td>Crop growing season</td>
<td>240 - 270 in places</td>
<td>Tree 150 - 240</td>
<td>270 - 300</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Foothills and Small Valleys

Climate

Tables for all the areas in this region are not available. Most areas would receive between 2000 - 3000 mm rainfall. Low hills in parts of the Bird’s Head would receive up to 4000 to 5000 mm per year.

Soils

Northern Mountain Ranges. The soils in this region are derived from a range of parent materials including sandstones, siliceous mudstones, acid metamorphic rocks and better drained sandy alluvials. These produce base-deficient soils, with a weakly active clay fraction. These have textures ranging from fine-loamy to fine-loamy over fine. On less stable slopes, profile development is retarded by continual surface wash and landslips.

100

101
Over calcareous parent materials, soils are affected by the proximity to lime-bearing strata, its ability to release calcium or magnesium ions, the soil depth and position on the slope. Over pure, harder limestone, bare outcrops are common, but become covered by rockmass binding together thick humus layers. With continuous rainfall these organic soils become leached and acid. Over basic rocks, ultra basic rocks and possibly on other gysic or amphibolitic schists, strongly weathered and leached oxisols would result on stable slopes. The clay content of these soils is high, but with low clay-exchange activity. Phosphorous is strongly absorbed on to iron oxides and is made unavailable to plants. The agricultural potential of these soils is marginal.

<table>
<thead>
<tr>
<th>Table 9 Summary of Climatic Data for Jayapura Climate Station</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coordinates</strong></td>
</tr>
<tr>
<td>Jayapura</td>
</tr>
<tr>
<td><strong>Elevation m</strong></td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td><strong>Rainfall range mm</strong></td>
</tr>
<tr>
<td>2000 - 3000</td>
</tr>
<tr>
<td><strong>Temperature °C</strong></td>
</tr>
<tr>
<td>Mean Max. (range)</td>
</tr>
<tr>
<td>32-33</td>
</tr>
<tr>
<td>Mean Min.</td>
</tr>
<tr>
<td>25-24</td>
</tr>
<tr>
<td><strong>Relative humidity percent</strong></td>
</tr>
<tr>
<td>80-85</td>
</tr>
<tr>
<td><strong>Wind speed m/s</strong></td>
</tr>
<tr>
<td>1-2.6</td>
</tr>
<tr>
<td><strong>Annual Sunshine hours</strong></td>
</tr>
<tr>
<td>1,868</td>
</tr>
<tr>
<td><strong>Open Pan Evaporation mm</strong></td>
</tr>
<tr>
<td>1,500</td>
</tr>
<tr>
<td><strong>Penman</strong></td>
</tr>
<tr>
<td>Moisture Deficit days</td>
</tr>
<tr>
<td>areable</td>
</tr>
<tr>
<td>70-75</td>
</tr>
<tr>
<td>tree</td>
</tr>
<tr>
<td>140</td>
</tr>
<tr>
<td>Crop growing seasons</td>
</tr>
<tr>
<td>150-190</td>
</tr>
<tr>
<td>1 Reduces at the rate of 50 mm for every rise of 100 m</td>
</tr>
<tr>
<td>2 Reduces at the rate of 0.5°C for every rise of 100 m</td>
</tr>
</tbody>
</table>

Highlands

Broad Valleys

These are all included in the Highlands Physiographic Region in a general description which does not serve our purposes. A separate description of the Grand Baliem Valley is given.

Summary of climate based on the Wamena climate station is shown in Table 10.

Baliem Valley soils. The floor of the Grand Valley is composed of sediments from the Baliem river and by those from its tributaries. The side valleys and parts of the valley slopes are partly filled with alluvial colluvial cones. Mixture with limestone gives the Baliem soils a less acid reaction than some of the soils on the surrounding hills. The valley is interspersed with infilled remnant river courses and old oxbows. In the south, the valley is bordered by an interrupted row of lower sandstone hills, less than 50 m above the plain. Further south, alluvial colluvial fans are found between the shoulders of the higher mountains. The impression of terrace levels in the plain have been attributed to the occurrence of alluvial fan ends, rather than to sedimentation levels formed by the Baliem river. River sediments are confined to the two lowest terrace levels. These are sandy stratified in a recent Baliem deposit. These soils have been cultivated over a long period and are strongly anthropogenic, with mixing down to 30 to 50 cm. the fat Baliem deposits are on the acid side of neutral, varying between 6.0 - 7.5 and sometimes 5.0 - 6.0. In a recent survey there was an unconfirmed suggestion, based on observations from the air, that peat soils may occur in the northern extremes of the valley.

Table 10 Climate Data for Baliem Valley

<table>
<thead>
<tr>
<th>Wamena</th>
<th>04°05'S, 138°55'E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1550</td>
</tr>
<tr>
<td>Rainfall</td>
<td>Mean annual</td>
</tr>
<tr>
<td>Range</td>
<td>1759</td>
</tr>
<tr>
<td>valley</td>
<td>3000 - 5000</td>
</tr>
<tr>
<td>Dry months</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Wet months</td>
<td>7 - 12</td>
</tr>
<tr>
<td>Temperature °C</td>
<td>Mean Max. (range)</td>
</tr>
<tr>
<td></td>
<td>25-27</td>
</tr>
<tr>
<td></td>
<td>Mean Min.</td>
</tr>
<tr>
<td></td>
<td>15-20</td>
</tr>
<tr>
<td>Relative humidity percent</td>
<td>81</td>
</tr>
<tr>
<td>Wind speed m/s</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>June</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>September</td>
</tr>
<tr>
<td>Annual Sunshine hours</td>
<td>1,716</td>
</tr>
<tr>
<td>Open Pan Evaporation mm</td>
<td>1,600</td>
</tr>
<tr>
<td>Moisture Deficit days</td>
<td>Penman</td>
</tr>
<tr>
<td>areable</td>
<td>1,348</td>
</tr>
<tr>
<td>tree</td>
<td>115</td>
</tr>
<tr>
<td>Crop growing seasons</td>
<td>110</td>
</tr>
<tr>
<td>Sands</td>
<td></td>
</tr>
<tr>
<td>Sands</td>
<td></td>
</tr>
<tr>
<td>Clay</td>
<td></td>
</tr>
<tr>
<td>Sands</td>
<td></td>
</tr>
<tr>
<td>Clays</td>
<td></td>
</tr>
<tr>
<td>270-365</td>
<td></td>
</tr>
<tr>
<td>&lt; 270 at Wamena</td>
<td></td>
</tr>
</tbody>
</table>

Lakeshore Plains

This area includes the shore areas of lakes Paniai, Tage and Tigi and the river flats which drain into the respective lakes. It also includes the infilled lakebeds in the Kamu valley.

Climate

In the absence of climate stations rainfall is the only measured parameter of climate, a summary of which is given in Table 11 below.

Soils

Kamu Valley and soils on Lakeshore Plains are influenced by inwash materials from surrounding hills. On the lower slopes, the dominant soils have a light brown humic topsoil about 40 cm deep largely influenced by traditional sweet potato cultivation. These soils are acid with a pH of around 5. They are also prone to flooding from local runoff following heavy rain or from upper valley runoff. The texture varies from loamy to clayey in the topsoil and is mostly clayey in the subsoil. There is a low erosion risk. Also occurring on these slopes are similar soils with a weakly developed A horizon. The clay material from the sub soils is used to treat peaty soils.
Table 11: Summary of rainfall data for selected Lakeshore rain stations

<table>
<thead>
<tr>
<th>Station</th>
<th>Coordinates &amp; Elevation m</th>
<th>Mean Annual Rainfall mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enarotai</td>
<td>03°5'1&quot;S, 136°22'E, 1750m</td>
<td>3439</td>
</tr>
<tr>
<td>Enarotai 1</td>
<td>03°5'1&quot;S, 136°22'E, 1750m</td>
<td>2249</td>
</tr>
<tr>
<td>Epouto</td>
<td>03°5'9&quot;S, 136°22'E, 1800m</td>
<td>3051</td>
</tr>
<tr>
<td>Waghete</td>
<td>04°0'30&quot;S, 136°15'E, 1750m</td>
<td>3199</td>
</tr>
<tr>
<td>Moanemani</td>
<td>04°0'30&quot;S, 136°15'E, 1750m</td>
<td>2162</td>
</tr>
</tbody>
</table>

The next soil in this sequence is transitional between the mineral and peat soils. Those have a peaty top layer. The topography is nearly flat, leaving the soils with a high flood risk. The upper layer is anchored by the roots of swamp grasses and may be weathered into a crumbly earthy topsoil with or without addition of mineral soil materials. These soils may have organic profiles deep, 180 cm, near to alluvial/loessial fans, and the deeper subsols may have entirely mineral. The final component in this sequence is floating peat of 1 m or less on water.

Hillslopes in Highland Valleys

Climate

In the absence of climate stations other than Wamena, a summary of rainfall is given from selected rain stations.

Table 12: Summary of Rainfall for Selected Hillslopes in Highland Valley rain stations

<table>
<thead>
<tr>
<th>Station</th>
<th>Coordinates &amp; Elevation m</th>
<th>Mean Annual Rainfall mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit River</td>
<td>04°0'1&quot;S, 136°31'E, 2500 m</td>
<td>1772</td>
</tr>
<tr>
<td>Bokondini</td>
<td>03°4'2&quot;S, 136°43'E, 1200 m</td>
<td>3270</td>
</tr>
<tr>
<td>Apalapsil</td>
<td>03°35'5&quot;S, 136°20'E, 1620 m</td>
<td>5608</td>
</tr>
<tr>
<td>Panggema</td>
<td>04°0'8&quot;S, 136°20'E, 1700 m</td>
<td>5008</td>
</tr>
<tr>
<td>Angguruk</td>
<td>04°0'05&quot;S, 136°20'E, 1200 m</td>
<td>4555</td>
</tr>
<tr>
<td>Wanyok</td>
<td>04°10'6&quot;S, 136°20'E, 2000 m</td>
<td>3101</td>
</tr>
</tbody>
</table>

Soils

Soils in these areas are highly influenced by erosion which occurred in several cycles. The parent material varies. In the Maki subdistrict the parent material is silt and claystone with local occurrences of shales or limestone. The soils are silted clays and are heavily eroded. These have strong to moderate hydromorphic features in the subsol which is a grey or lesser degree yellowish mottled. On the east of Maki river, the soils are less eroded. The lower and middle slopes have soils developed on silt and claystones, and shales with locally occurring limestone. These have a clear yellowish altered subsol with hydromorphic features. In the higher areas, the soils show hydromorphic features. With these, the topsoils vary between thin black humic to locally peaty deposits.

On ridge crests and gentle slopes upland areas peat may form. This is very acid and nutrient deficient. Clearing of forest and cultivation can rapidly destroy this peaty material. The underlying mineral soil is imperfectly drained, coarse to fine loamy and rarely deeper than 50 cm. Soils developing from limestone occur in the Wamena area. These are shallow fally brown and very susceptible to drought. They are very acid and leached of all nutrients except calcium.

Endnotes

1 Taken from the Irian Jaya Provincial Development Fund Project Preparation Mission Report, May 1989, Appendices 7 and 7.1.
2 Dr. Patrick H. Haynes worked under the auspices of the United Nations Joint Development Programme (UNDP), the International Bank for Reconstruction and Development (IBRD) and PPID from 9 February to 9 April 1988.
Notes on Irantu

(An Austronesian language spoken in the centre of the Bomberai Peninsula, Southwest Irian Jaya)

C.L. Voorhoeve

State University of Leiden

Bahasa Irantu adalah salah satu bahasa Austronesia yang digunakan di pusat daerah Semananjung Bomberai, di sebelah barat daya Irian Jaya. Di sebelah utara dan timur laut bahasa ini berbatasan dengan bahasa Wamena yang juga termasuk bahasa Austronesia. Salah satu bahasa terduga untuk bahasa tersebut adalah bahasa-bahasa Papuan, yaitu bahasa Mer di sebelah utara, bahasa Mairasi dan Kamrau di sebelah selatan, bahasa Baham, Mor dan Sebyar di sebelah barat dan bahasa Tanah Merah di sebelah barat laut (lihat peta).


Terima kasih telah melihat catatan tentang dialek-dialek bahasa Irantu, fonologi bahasa Irantu, pengajian prononcium, posisi/peran, perubahan morfologem dan klasifikasi bahasa Irantu.

Irantu is an Austronesian language spoken in the centre of the Bomberai Peninsula, Southwest Irian Jaya. In the north and northeast it borders on the Wamena language which is also Austronesian. All its other neighbours are Papuan languages: Mer in the east, Mairasi and Kamrau in the south, Baham, Mor, and Sebyar in the west and Tanah Merah in the northwest (see map). The present paper is based on data collected during fieldwork in the Kalmana area in August - September 1986 and on some language materials obtained from Irantu speakers living in Manokwari and Bintuni in 1982.

The first published data on Irantu appeared in 1983 in Cowan's survey of the then known languages in north and west Irian Jaya. He listed the pronouns, the numerals from 1 to 10 and a few other lexical items in two dialects called Kaidero and Arguni Bay, and added a few grammatical notes as well. Based on these he concluded that the language is Austronesian.

The next publication providing data on the Irantu language is Anceaux' survey of the languages of the Bomberai Peninsula (1988). Anceaux called the language Irantu, giving Irantu and Intu as alternative names. He did not give any lexical or grammatical data but listed the known dialects and village names and gave for each dialect the approximate number of speakers. I shall not reproduce his village names here as many of them are no longer in use as a result of the gradual condensation of the former settlement pattern of scattered hamlets into fewer but larger villages. Anceaux, basing himself on an earlier government report, distinguished four dialects and a potential fifth dialect:

1. The dialect spoken between the Kaidero river and Arguni Bay, with approximately 950 speakers. (I shall refer to this dialect as the Frusta dialect.)

2. The dialect of central Arguni Bay with about 1300 speakers. (In the following I shall label this the South-Arguni dialect.)

3. The dialect of northern and eastern Arguni Bay with about 800 speakers.

4. The dialect of the Babo area (henceforth the Babo dialect) with about 800 speakers.

5. The Nabi language according to Anceaux with about 550 speakers, spoken on the Nabi river to the northeast of the Irantu language. Nabi is very closely related to Irantu and often held to be a dialect of that language.
Three years later, in 1961, Anceaux included approximately 250 Irantu words in his survey of the linguistic situation in the Cenderawasih-(then Geelvink) Bay. His wordlist represents the South Arguni dialect. Anceaux' survey showed that all the Austronesian languages in Cenderawasih Bay belong to one subgroup, Irantu, according to Anceaux, does not belong to this same group. More recently Blust (1979) using Anceaux' data made a case for including Irantu with the Cenderawasih Bay languages in one and the same subgroup of Austronesian languages. I shall return to this point later.

The name Irantu is an impressionistic rendering of the phrase Irantu 'their language true' = 'their own language'. The sequence r with two flapped r's separated by a shewa is often shortened to one flapped r; this accounts for the variant form Irantu mentioned by Anceaux. The variant Irantu I have never heard. As the name Irantu has gained common acceptance I shall retain it in this paper.

Irantu is now spoken by an estimated 5000 - 6000 people. In 1956 the estimated total, including Nabi, was 4400. The 1971 census gives the following figures: Argun sub-district 3000, Babo sub-district 2000. The two sub-districts (kecamatan) cover all of the Irantu speaking area except for part of the Nabi dialect area. A small number of non-local residents is included in the figures. I did not have the opportunity to obtain the latest population figures. The estimate given above takes into account the additional Nabi villages and the steady increase of the population in Irantu.

My informants distinguished seven varieties of Irantu, mainly on the basis of lexical differences and differences in rima, a local term covering intonation, stress patterns, and speed of speech. There are two locally recognised differences in the realization of segmental phonemes which in themselves are not sufficient to set off all varieties from each other. I shall return to these below. The seven dialects are:

1. Nabi, spoken in the villages of Nabi, Raffdeso, Weradane, Owa, and Opu in the valleys of the Nabi and Kuri rivers and in Wagura and Sarebe on the Wagura river. The villages on the Nabi river seem to be bilingual. The second language spoken there was called Nanggwa by one of my Informants. This name does not appear in the two existing surveys of Irantu languages (Voorhoeve 1977, Barr and Barr 1978), but could be an alternative name for either Tandana or Mar, spoken to the east or south.

2. Babo, spoken in Sarebe and Wagura on the Wagura river, in Tugurama, Sara, and Warganusa on the lower Kaleri river and in Babo, the administrative centre of the Babo sub-district.

3. Kauini, spoken in Arba and Yaro on the Kasari river and in Tomage village which has a mixed population of Semyer, Tahai Menah, and Irantu speakers. Anceaux lists these villages under the Babo dialect but according to my Informants they speak a dialect which has similarities to Frusta as well as Babo.

4. Frusta is spoken in Frusta, Taniba-Wararama, Warunen-Egeneura, Manggara, Rauna and Weretuta-Temri. Frusta is a relatively new settlement near the Roman Catholic airstrip in the area and is made up of two former villages Mambrieme and Marledi. Initially Taniba-Wararama also moved to Frusta airstrip but it later returned to its old village site. Warunen-Egeneura and Manggara have in recent times moved from their inland locations to sites closer to Argun. Formerly Weretuta and Rauna were situated higher up the Gono river. Weretuta local tradition has it that its inhabitants once lived in the hills further west.

5. South-Arguni is spoken along the shores of Argun Bay in the villages Susunji, Sawatawera, Funlara, Wanggita, Yaweera-Manggai, Mandwiwa, Tanusan, Nagura, Sararing, Uklara, Warum-Malsenu, Waroa, Ambwerara, Matha and Bohwer. Bohwer is a new settlement and the administrative centre of the Arguni sub-district. It has a mixed population.


7. North-Arguni is spoken at the northern end of Argun Bay in the villages Tiwara, Wewasa and Eregara.

A considerable number of Irantu speakers, mostly from the Argun Bay area, is now living in the township of Kaimana and the nearby villages Tiwara and Krol. As I mentioned above there are two diagnostic features which mark dialectal divisions and which are locally recognized as such. The first one is the presence versus absence of prenasalization of the voiced stops. Only the Frusta and Kauini dialects prenasalize the voiced stops. The second is the presence of j in North-Arguni but all other dialects lack /j/. The data in hand are insufficient to determine whether there are still other phonological criteria which can serve to further delineate the dialects; in my data there are no materials in East-Arguni, Babo and North-Arguni are represented by only a few words and Nabi by an old 200-item wordlist compiled by the Dutch missionary Kyne. For South-Arguni there is Anceaux' wordlist and a short wordlist recorded by myself; for Kauini there is a short wordlist and some grammatical notes. The bulk of my data is in the Frusta dialect as this was the dialect spoken by my main informants. The following notes describe only the Frusta variant of Irantu.

**Phonology**

The inventory of the consonant phonemes is:

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>t</td>
</tr>
<tr>
<td>b</td>
<td>d</td>
</tr>
<tr>
<td>m</td>
<td>n</td>
</tr>
<tr>
<td>f</td>
<td>s</td>
</tr>
<tr>
<td>w</td>
<td>y</td>
</tr>
<tr>
<td>r</td>
<td></td>
</tr>
</tbody>
</table>

/p/: a voiceless bilabial stop. This phoneme seems to be a recent addition to the phoneme inventory introduced through Indonesian loanwords. Only very few cases of /p/ have been noted, almost all in clearly recognisable loans. The fricative /f/ which historically derives from *p* originally occupied this structural position.

/n/: a voiceless dental-to-lingual stop. Occurs word-initially (i), word-medially (M), and Word-finally (F).

/k/: a voiceless velar stop. Occurs I, M, F.

/l/: in word-initial position; a voiced bilabial stop, often prenasalized [b ~ /mb/], in medial and final position always prenasalized with voiced and unvoiced stop allophones ([b ~ /mb/], [d ~ /md/], [g ~ /mg/]).

/nd/: in word-initial position a voiced dental to interdental stop, often prenasalized; [d ~ /nd/][d ~ /nd/]; in medial and final position always prenasalized, with voiced and unvoiced allophones; ([d ~ /nd/][d ~ /nd/]).

/ñ/ in initial position a voiced velar stop, often prenasalized; [g ~ /ng/]; medially and finally always prenasalized with voiced and unvoiced allophones ([g ~ /ng/]).

/n/: a dental nasal. Occurs I, M, F.

/nt/: a voiced nasal. Occurs I, M, F.

/ñ/: a dental nasal. Occurs I, M, F.

/ñ/: a bilabial fricative, in initial and final positions always unvoiced, in medial position between two vowels sometimes voiced. In initial position sometimes a weak bilabial affricate: [p ~ /pt/], M: [p ~ /pt/], F: [p].

/ñ/: a voiceless dental fricative. Occurs I, M, F.
In this paper I shall not use a strictly phonemic spelling as this would pose problems for those not acquainted with the language. /b/, /d/, /g/ will be written as b, d, g. In word-initial position and as mb, nd, ngg in medial and final position. Non-phonemic [a] will be written when it separates two consonant phonemes. In polysyllabic words stress will be marked when it is carried by another vowel than the last one. The stress marker is '. Thus, the example of 'you shot the pig' given above will be written 'n-samasambegget fans.'

**Verbs**

Transitive and intransitive action verbs are marked for person of agent only. Maximally 1st, 2nd, and 3rd person are distinguished. The markers are prefixed.

<table>
<thead>
<tr>
<th>1st p.</th>
<th>2nd p.</th>
<th>3rd p.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-i, we</td>
<td>-yu (sg, pl)</td>
<td>-he, she, it; they</td>
</tr>
</tbody>
</table>

They are found with verb stems which do not cause any morphophonemic changes. These are stems with an initial vowel, t (if followed by a stressed vowel), k, d, g, n, r, y.

**Morphophonemic changes:**

1. n- + stem-initial t: > d
   - split: tafe → matafe d:de
   - sink: tefur → metetur d:fur

2. m- + stem-initial f: > b
   - go: fa → ba → nafa
   - hear: banongger → banongger → nabanongger
   - make: ton → bon → nafon
   - steal: baror → baror → nabaror
   - abuse: fat → bite → nifate → etc.
Notes on Irрутu

3. m + stem-initial m: > m; + stem-initial b: > b. These verbs are therefore marked for 3rd and non-3rd person only.

| stand | Ṳanir | nam o Ṳir |
| sit   | Ṳator | nam a Ṳor |
| be    | mi    | nam a mii |
| hide  | bainfun | naban fun |
| laugh | bair | nabair |

4. n + stem-initial s: > s

These verbs are marked only for 2nd and non-second person.

see: si meai
return: su mau

A few verbs seem to be irregular, having g- marking 1st and 2nd person, and n- marking 3rd person:

sleep: gen nen
drink: gin nin
eat: ga na

Verbs can be preceded by particles indicating aspect and mode:

bu completive,
do progressive,
gə intention, wish;
ɡə na fe to eat something;
yə ga fe I ate/eat;
yə bu ga fe I have eaten;
yə do ga fe I'm eating

ɡə ga fe I want to eat (something).

Personal/possessional pronouns

The basic forms of the pronouns can function as personal and as possessive pronouns; the exception is 1plg ye which does not occur as a possessive pronoun.

<table>
<thead>
<tr>
<th>Sg. 1</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ya,a</td>
<td>yar</td>
<td>yar</td>
<td>yar</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>i</td>
<td>iri</td>
<td>?</td>
</tr>
<tr>
<td>Pl. 1 incl.</td>
<td>it</td>
<td>ite</td>
<td>ite</td>
</tr>
<tr>
<td>Excl.</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>ir</td>
<td>iri</td>
<td>?</td>
</tr>
</tbody>
</table>

Series I:
The form ya functions as subject and object, a can function as verb subject and also occurs as a possessive pronoun. Thus:

ya 'a gene el 'I dream saw' = 'I dream'; a wamə 'my blood'; but ya wamə 'I am red/bloodied'.

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Series II:

These are emphatic forms - perhaps they can be described in terms of focus or foregrounding. The element ro is also found after nouns as an emphasis (focus') marker. No definite/indefinite distinction seems to be involved.

Series III:

Only the 1st and 2nd p. sg. forms have been collected. These are possessive forms which occur predicatively ('mine', 'yours' etc.).

Series IV:

These are the emphatic variants of the series III forms.

In the possessive noun phrase the head noun is preceded by the possessive pronoun. Normally the head noun is not morphologically marked for possession; exceptions are nouns referring to bodyparts, at least one kinterm, and 'name'. All of these take possessive suffixes indicating the person (not the number) of the possessor. They are:

1st person: -nng, -nngg, -nngg
2nd person: -n, -um, -om
3rd person: -o

For example:

fra am: a, It, am fra: ga: ɡə fra fra: ir fra: rik ɡə 'kin'; a, am, it rígụ: iri gụ: iri rik: nu 'thigh'; a numun i: iri numun i: iri numun i: namu (from *nanum?)
no 'name', nom your name'
ta fand 'elder sibling, same sex', a tang fand my elder sister'

The forms of series II can have a possessive meaning if preceded by te 'perhaps, possibly':

te yar 'it(s) possibly mine'; te yar 'it(s) possibly yours'.

besides:

yar 'it(s) mine'; yar 'it(s) definitely mine'.

The forms of series III can follow the possessed noun in which case they stress the possessive relationship:

a m: 'my child'
a m: yar 'definitely my child';
ir: -om 'with rising intonation' is it definitely your child?

When the possessor is a noun there are two possibilities: a Noun - Noun construction in which N1 is the possessor and N2 the possessed, or a Noun - Possessive Pronoun - Noun construction:

fra fand 'fingerfam';
fra el 'elbow';
maren fra 'a man's hand';
a di: 'my father's house';
a di: 'my father's house (with added emphasis on 'house')'.
There is some evidence that Irunatu once had a possessive particle *ne which could take possessive suffixes. It is now found only in what seem to be petrified constructions. I noted

fra net ‘finger’ possibly from *frefen tu, and *a gataman/ a namataman / i nataman ‘my’/ your’
his son-in-law’ possibly from *anenn gataman / o nem tamam / *i ne taman.

We have seen that verbs take prefixes, nouns and personal pronouns take suffixes. In addition both verbs and nouns can be reduplicated; reduplication affects either the first or the second syllable. The reduplicated forms noted were all nouns:

fan ‘to walk’; fanf ‘road’;
tube ‘to beat’; tamemb ‘bruise (cause by beating);’
mafu ‘to get up’; macro ‘the tempo of a pickaxe’.
sat ‘shovel’; sasu ‘a measuring tool, yardstick’.

Word order:

Irunatu is an SVO language. Noun modifiers and numerals follow the noun:

m ‘at a small child’;
wer ‘at a sweet water’;
silem komb ‘heavy rain’.

Some nouns require a numeral classifier when counted:
omango fu ‘one coconut’ (fu fruit), eso ‘one’
fanf tefu ‘one pig’ (fanl body), eso ‘one’

The classification of Irunatu

The location of Irunatu in the Bombari peninsula is such that it could be a member of either of two major subgroups of Austronesian languages, the Central Malayo-Polynesian group (GMP) or the South Halmahera West New Guinea group (SHWNG). The nearest Austronesian languages to the west and south - Kolaw, Orin, and a few others - belong to the CMP group, as do the languages of Maluku Tengah, Maluku Tenggara, and Nusa Tenggara Timur. The Austronesian languages to the northeast - Wandamen and all the AN languages in Cenderawasih Bay - belong to the SHWNG group. Anceaux who was the first to survey the Austronesian languages in Cenderawasih Bay (Anceaux 1961) concluded that they all belong to a single subgroup of Austronesian, but he expressly excluded Irunatu from this subgroup. Later, Blust (1978) united the Cenderawasih Bay languages with those of the Raja Ampat islands and the AN languages of South Halmahera into one subgroup which he labelled the South Halmahera West New Guinea group (SHWNG). This group, according to Blust, falls into two first order subgroups: South Halmahera/Raja Ampat and Cenderawasih Bay. On the basis of Irunatu material published by Anceaux in 1961 (approximately 250 lexical items) he came to the conclusion that Irunatu does belong to the SHWNG group, but he did not commit himself to assigning Irunatu to a specific place within the group. Blust noted that Irunatu shares with the Cenderawasih languages at least four of the 13 phonological innovations he has used to establish the SHWNG group.

These four innovations are:

1. *e > o
2. *d, z, s > l or r
3. e, a > a (C, Bay languages); O, e (in Irunatu).
4. *C, L, T, J, 0, s > s

The first innovation is that PAN *e becomes o in the one but last syllable of a word. Thus:

<table>
<thead>
<tr>
<th>PAN</th>
<th>IR</th>
<th>Notes on Irunatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>*dengoR</td>
<td>&gt; IR nonggor</td>
<td>to hear</td>
</tr>
<tr>
<td>*tebuSi(u)</td>
<td>&gt; IR tof</td>
<td>sugarcane</td>
</tr>
<tr>
<td>*telu</td>
<td>&gt; IR tor</td>
<td>three</td>
</tr>
</tbody>
</table>

Examples of the second innovation are:

<table>
<thead>
<tr>
<th>PAN</th>
<th>IR</th>
<th>Notes on Irunatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>P aSun</td>
<td>&gt; IR ra</td>
<td>leaf</td>
</tr>
<tr>
<td>* DuSa</td>
<td>&gt; IR ri-lo</td>
<td>two</td>
</tr>
<tr>
<td>* Zalan</td>
<td>&gt; IR randeni</td>
<td>path</td>
</tr>
<tr>
<td>* fangCi</td>
<td>&gt; IR ranggit</td>
<td>sky</td>
</tr>
<tr>
<td>* s. fDa</td>
<td>&gt; IR ir</td>
<td>they</td>
</tr>
</tbody>
</table>

The third innovation is that PAN *e1 and *a have merged to become a in the Cenderawasih Bay languages, but that both have either o or 0 (zero) as a reflex in Irunatu. This observation by Blust appears to be only partially correct; *e1 (= *e in the last syllable of a word) is often dropped (i.e., becomes phonetically []) but also has I and o as reflexes:

<table>
<thead>
<tr>
<th>PAN</th>
<th>IR</th>
<th>Notes on Irunatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>* dengoR</td>
<td>&gt; IR nonggor</td>
<td>to hear</td>
</tr>
<tr>
<td>* ineP</td>
<td>&gt; IR en</td>
<td>to sleep</td>
</tr>
<tr>
<td>* tanem</td>
<td>&gt; IR tan</td>
<td>to plant</td>
</tr>
<tr>
<td>* qalup</td>
<td>&gt; IR ati</td>
<td>thatch</td>
</tr>
<tr>
<td>* lipen</td>
<td>&gt; IR rafu</td>
<td>tooth</td>
</tr>
</tbody>
</table>

*a mostly remains a like in the Cenderawasih Bay languages, but o as reflex occurs too. In addition to 'to plant' and 'thatch' given above we have:

<table>
<thead>
<tr>
<th>PAN</th>
<th>IR</th>
<th>Notes on Irunatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>* manuk</td>
<td>&gt; IR man</td>
<td>bird</td>
</tr>
<tr>
<td>* panaw</td>
<td>&gt; IR fan</td>
<td>to go</td>
</tr>
<tr>
<td>* Zalan</td>
<td>&gt; IR randani</td>
<td>path</td>
</tr>
<tr>
<td>* qabara</td>
<td>&gt; IR far</td>
<td>PAN: shoulder, IR: carry over the shoulder. (This is one of the semantic innovations Blust attributes to the SHWNG languages).</td>
</tr>
</tbody>
</table>

Interesting is the that *e1 > o and *a > o shifts also occur in the westermmost languages of the South Halmahera subgroup and in the same words as in IR:

<table>
<thead>
<tr>
<th>But: PAN</th>
<th>IR</th>
<th>Notes on Irunatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>* mada</td>
<td>&gt; IR mar</td>
<td>ripe</td>
</tr>
<tr>
<td>* lipen</td>
<td>&gt; IR eso</td>
<td>one</td>
</tr>
</tbody>
</table>

It is a parallel which calls for an explanation and which could be relevant for the determination of the position of Irunatu within the SHWNG group.

The fourth innovation postulated by Blust is that PAN *C, t, and T merged and became a when followed by a high front vowel (b- when not followed by a high front vowel), and that *c, t, s merged becoming a in all environments. It appears that Irunatu fulfills only the second part of the innovation (*c, t, s > a); at least *t and *T did not become a before I (I have no data on *C in this environment):

<table>
<thead>
<tr>
<th>PAN</th>
<th>IR</th>
<th>Notes on Irunatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>* susu</td>
<td>&gt; IR sus</td>
<td>breast</td>
</tr>
<tr>
<td>* esa</td>
<td>&gt; eso</td>
<td>one</td>
</tr>
<tr>
<td>* pajey</td>
<td>&gt; eso</td>
<td>rice</td>
</tr>
</tbody>
</table>
Notes on Irarutu

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"bi(T)l" > bitar hungry
"nulih" > to persis
"puTuah" > fut white

To these can be added IR t 'ni 'body'; POC has *tlnl. The PEMP form probably was *tlln.

In environments other than preceding a high front vowel PAN C, t merged to become t.

PAN

Calinga IR tarnaga (with metathesis of C2 and C3 ear
tangis > t tangg to cry
*tuTaRaq > tar to chop

So, IR is the only SHWNG language in which the *C1,t > s shift did not occur unless the resulting s became t which is highly unlikely in the environment / -l/, especially since there is no supporting evidence of a > t in Irarutu. This would make Irarutu a very early offshoot of Proto-SHWNG. We would have to assume that PAN *C1,t had merged to t in this language, and that the shift from t > s / -l/ only occurred after 'Proto-Irarutu' had split off:

SHWNG

IR

SHCB (South Halmahera-Cenderawash Bay)

The data presented so far point to Irarutu occupying an isolated position within the SHWNG group of languages - unless Tandia and Yerrutar of which no description is available to me are found to group together with Irarutu. The aberrant character of Irarutu also shows in a number of other developments specific to this language:

1. The development of a seven-vowel system from the five-vowel system common to the other SHWNG languages.

2. A far-reaching morphological simplification. This is most obvious in the loss of number distinction in verbs and nouns. Proto-SHWNG probably had plural marking at least in nouns with the semantic feature (*-turan), and marking of plural and dual in the verb. With the loss of number also the inclusive-exclusive distinction in the first person nonsingular disappeared. Proto-SHWNG further had a possessive construction in which the possessor noun and the possessed noun were linked by a particle *ne which took person affixes. As we have seen only traces of it seem to remain in Irarutu. A distinction between edible and inedible nouns, manifested in different markers in the possessive construction, still present in Bulu and many Oceanic languages was also lost.

It is possible that at least part of the morphological simplification of Irarutu, especially the loss of number, is a result of contact with the non-Austronesian languages which Irarutu found on its way when it moved into the Bomberai Peninsula. The geographical distribution of the SHWNG languages suggests that early Irarutu speakers entered the peninsula from the northeast, crossing the mountain ranges that separate Cenderawasih Bay from the peninsula. Irarutu traditions which point to the Nabi River area as their point of origin may be an echo of this early migration.

When the Irarutu ancestors moved further into the peninsula they found it populated by speakers of languages ancestral to the Mer and Tanah Merah languages. Mer, Mairasi, and Tanah Merah are related languages and it is clear from the present-day distribution of these languages that Irarutu wedged itself between Tanah Merah and Mairasi. There are no data which point to an early contact with Mer and Bahem speakers; the Sebyar speakers in the northwest of the peninsula have only recently arrived from the opposite side of the MacCluer Gulf (i.e. not more than a couple of centuries ago). On the other hand, it is clear that Irarutu speakers must have had a long lasting contact with the Kamrau and/or Sabakor groups to the south. These groups are themselves immigrants who arrived many centuries ago from the southeast, probably from the Asmat area. There are strong parallels both in mythology and in social organisation between the Irarutu and Kamrau/Sabakor cultures which must be due to mutual influence. Mythological data collected among the Irarutu suggest that they used to live further north and therefore were in much closer contact with the Irarutu speakers than they are now.

Cultural contact implies lexical borrowing. I can give here only one example of a Kamrau/Sabakor borrowing in Irarutu: the word act 'woman' found in all Irarutu dialects except Nabi is probably related to Kamrau yoda, Sabakor yowya, Kamoro koaka, Asmat toot, cowoc.

Further study of Irarutu should throw more light on the borrowing relationship between Irarutu and its neighbours - not only Kamrau and Sabakor, but also Tanah Merah and Mairasi as they must have lost part of their language territory to Irarutu.

Finally, a more recent factor influencing Irarutu must have been the contact with speakers of Koikai and other Central Malayo-Polynesian languages spoken on and near the Bomberai Peninsula.

All these earlier influences are now replaced by the impact of the Indonesian language, propagated by the educational system, radio, and television. It is the task of future research to describe the Irarutu language in detail, disentangle its original from its borrowed contents and to document the language change resulting from the increasing knowledge of Bahasa Indonesia.

Endnotes

1. This paper was presented to the Seminar Pembangunan Irian Jaya dan Penelitian Indonesia Bagian Timur in Jayapura, 18-23 July 1988.

2. In August/September 1982 when I made a survey of the languages in the Bird's Head I had twice the opportunity to collect some first-hand Irarutu data. In Manokwari I recorded a wordlist in the Frutu dialect with the help of Mr. Salomon Nafunbenan from Mabriema village. In Bintuni I obtained a wordlist and some grammatical information from Mr. Victor Motombie, deacon of the Roman Catholic Mission. Mr. Motombie came from Arapia village where the Karuti dialect is spoken. In 1986 I visited the southern Irarutu village of Werefuta (Frutu dialect) where Marus Durye and Gerard Kriwa helped me to compile a 1200-item wordlist with grammatical notes. In Kimana the RC deacon Damianus Surinde from Maried village (Frutu dialect) gave me additional lexical and grammatical information. A casual informant, Muhammad, from Susunui village provided me with a short wordlist in the South Arguni dialect. To all of them I wish to express here my sincere thanks for their generous help.

2. Central Malayo-Polynesian (CMP) is one of the two branches of Central-Eastern Malayo-Polynesian (CEMP). The languages belonging to CMP are found in Maluku Tengah and Maluku Tenggara. The other branch of CEMP is Eastern Malayo-Polynesian (EMP) which split into South Halmahera-West New Guinean (SHWNG) and Proto Oceanic (POC):

Proto Austronesian (PAN)

CEMP

CMP

EMP

SHWNG

POC (after Blust 1979)
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Note: The position of Waropen and Mor is uncertain; Tandia and Yieatu have not been included as data are almost wholly lacking. Bili, Maba, Weda and Patani form a dialect chain and so do Maya, Baniol, Teppin and Batar. The position of Iriatu in the group will be dealt with later.

3. For the complete list of innovations see Blust 1978. In connection with the Cenderawasih Bay languages Blust mentions two more innovations in addition to the four discussed here. They are: (5) k,q,H,x; (6), (7) Syncope. Both present complications which I shall skip here as they are not directly relevant to the topic of this paper.
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