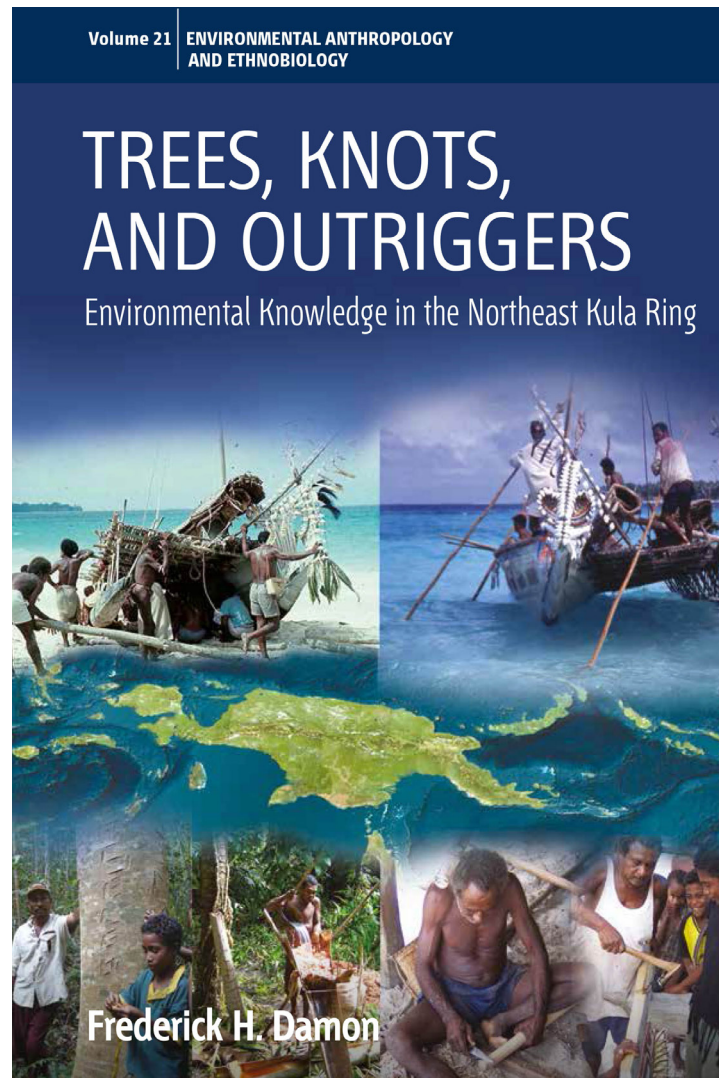


Trees, Knots, and Outriggers (Kaynen Muyuw): Environmental Knowledge in the Northeast Kula Ring

Supplementary Material

Frederick H. Damon





Leaves from *Calophyllum Inophyllum*, Kakam in Muyuw, one of the five *Calophyllum* used to construct anageg, the largest outrigger canoes plying the eastern side of the Kula Ring. The large curving shapes this tree's roots and branches achieve are carved into intricate and important parts of anageg craft; the leaf shape is used as a model for aydinidin sails, the sail form that traditionally went along with the anageg class of boat.



In 2012, my friend and teacher, Ogis, stands next to the model anageg he made for me as it is about to be launched. Note the white prow and stern sections. Much of that whiteness was from liquefied lime, and it was understood it would soon wash away were this a real boat. But also note the black spots dotting the white background. These are part of an inverted image of the night that these boats are supposed to depict. These craft connect the ground from which their materials come and which they bind by their very travels, to the heavens whose motions establish orientations in both time and space.

Introduction: CHANGES AND LAST CHAPTERS

INTRODUCTION–*Sipum*



“I delivered your letter to Amoen today at Wabunun and he claimed that he knew what your query would be before he opened the letter and that he would be the only one who could answer it.” August, 2006, George Clapp, community relations for Woodlark Mining Ltd.



The author and Sipum's wife, Bwadibwad, August 2009

A LAST VOYAGE



On Ole's beach Duweyala and daughter scrape bark for caulking his anageg, Levanay. Koyagaugau is in the background.



Duweyala beating scraped bark into a putty-like consistency.



Caulking a cross beam inside the Levanay's hull.



Caulking a cross beam under the outrigger platform.



“Painting” Levanay with seaweed. Note that the forward cross beam is not caulked.



Withdrawing the kavavis (rudder) as a wave rolls into the outrigger.



“Rudder,” lowered into the water.



Sail low on the mast, tell tales shooting out with the wind.



Snapped mast.



Birdlife...approaching Nasikwabw. This is a mwag, a bird considered a “sign” or “marker” of a nearby island. From this picture Bruce Beehler identified it as “a frigatebird, one of two possible species – Greater Frigatebird *Fregata minor* or Lesser Frigatebird *Fregata ariel*.”



Levanay sailing into the wind. The sailing direction is straight through the prowboard at the lower left corner of the frame. The rough, slatted inside of the sail centers the scene; Chapter 5 describes the sail structure. To the upper right is the flag, blowing into the camera. Below it is the rack of woven coconut fronds used to protect the sail when it is stored; on top of the fronds are the remains of the craft’s previous sail.

Revised and corrected (10/3/2015) Waypoint readings from 7/2002 voyage from Ole to Waviay.

TABLE 0.1

TIME	POSITION	SPEED	DIRECTION	DISTANCE TRAVELED
OLE TO 'PANAMUT' – PUSH OFF 9:45 4/7/02				
9:54	10° 23 59 151° 25 37	7.3	052-061	
10:17		6.8	59-70	
10:48	10° 21 40 151° 30 36	7.1	57	
11:29	10° 19 21 151° 34 04	7.4	43-52	13 MI.
12:18	10° 17 01 151° 38 53	6-7.5	53-61	16
1:19	10° 15 05 151° 44 22	6.6	65-76	17.9
1:54	10° 14 21 151° 47 27	4.7-5.2	78-90	20
2:40	10° 14 09 151° 51 05	7.3	60	22
BEACHED LOCATION: 10°14' 14S 151°51' 48				
'PANAMUT' TO NASIKWABW – DRIFT OFF AT 4:44AM 6/7/02				
TIME	BEARING	SPEED	DIRECTION	DISTANCE TRAVELED
4:44	10° 14 15 151° 51 46			
5:18	10° 13 20 151° 51 39	6.3-7	20-23	
5:43	10° 11 45 151° 52 59	6-7	29-33	
6:22	10° 08 49 151° 51 52	6	30	
7:08	10° 05 17 151° 57 19	5 -7.7	25-40	
7:54	10° 01 23 151° 59 47	8-10		
8:42	9° 57 24 152° 02 14	8 ⁺		
9:30	9° 53 48 152° 05 06	5-7	30-40	
9:59	9° 52 40 152° 06 57	4-9	20-50	
10:36	9° 50 35 152° 09 06	4.9-7.8	30-50	
10:59	9° 48 38 152° 10 58			Drifting because of snapped mast
11:09	9° 48 19 152° 10 51		358	
11:20	9° 48 06 152° 10 43			
11:46	9° 47 31 152° 10 25			
12:07	9° 47 02 152° 10 10		0	
12:17	9° 46 46 152° 10 21		40-50	
12:50	9° 45 45 152° 12 40	6.9	50	
1:05	9° 45 01 152° 13 45	6.2	60	
2:05	9° 40 40 152° 16 42	7.4	26	
2:58	9° 36 42 152° 19 30	6	38	
3:58	9° 33 28 152° 23 20			
4:24	9° 32 49 152° 25 37			Adjacent to west end of N
5:10	9° 33 08 152° 26 29			Meters from landing
NASIKWABW TO WAVIAY Departure, paddling at 10:02 15/7/02				
9:57	9.33:06 152 26 30	floating		
10:35	9°32 02 152° 27 07	5.6	20-30°	
11:18	9° 29 15 152° 29 50	7.2	40-50°	
12:22	9° 26 20 152° 34 53	7	60°	
1:08	9° 24 10 152° 38 11	6.2	30-50°	
2:03	9° 21 58 152° 41 41	5.1	60°	
2:59	9° 20 07 152° 45 23	4.3	50°	
3:43	9° 18 44 152° 48 22	5	70°	
4:13	9° 18 00 152° 50 17	5	60°	
4:45	9° 16 38 152° 52 30	5	60°	
5:05	9° 15 42 152° 53	6.3	57°	
5:12	9° 15 38 152° 54 05	beached		

This table is the original data from my notebooks for the journey from Ole-Panamout-Nasikwabw-Waviay, July 4, 2002-July 15, 2002. Simon Bickler used this data to construct Map 0.1. The Voyage of 2002 and Table 0.1, The Voyage of 2002, July 4–15, 2002.

PRACTICALITIES (1)—Original Intentions



The women struggling to walk with the heavily loaded baskets on their heads—the three sisters, the lead the widow—carry yams, and betel nut, to the nominal father of the deceased. They return to ‘him’ what he used to make the deceased. Their tottering gate replicates an image of the Creator, Geliu, holding the island on her-?-head.



1995. Linus Digim’Rina directed me to this typical (Okaibom) Trobriand scene, an early fallow garden with the skeletons of Gweda/Gwed trees pot-marking the field, at their bases taro, in this case, crowded as close to the trunk as possible. Eastern Muyuw gardens would look similar to this one though most taken at this camera’s angle would show a background of uncut forest.

PRACTICALITIES (2)—Getting Ready



Simon Bickler washing pot sherds in 1996: Bickler's archaeological survey of Woodlark Island produced three sets of new data; about the prehistoric settlement of the northern Massim during the last 1500 years including the first detailed pottery sequence for the island; the main working floors at Suloga Peninsula facilitating a technological description of the famous Woodlark stone tool industry; and the richest excavations to date of stone arrangements which, common across the Northern Massim, very likely predate the public works associated with Polynesia. Dating from at least 1500 BP, the Muyuw arrangements organized labor for public commemoration of the dead. It may be that by 600 BP the symbolic landscape the ruins organized was thoroughly routinized, then transformed by the social forms which gave rise to the famous Kula exchange system.

PRACTICALITIES (3)—Confessions



2009: From picks and shovels 100 years ago to this machine power. This is one of two drills working for Woodlark Mining LTD 24/7 whose powers plumb a scoured landscape for secrets yet to transcend the Creator's curse. Each drill set consumes about ten 200 litres drums of diesel fuel for each 12 hour period.



Vekwaya standing next to mamina (*Syzygium* sp.) bark for collected for ritual firewood in Kaulay village. Vekwaya was my primary host in Kaulay village from 1974 to the early stages of the research for this book into 1996. By then he was too arthritic to do the walking I required so I passed to his younger brother, Talibonas, who had married a woman from Wabunun. Vekwaya was a fanatic gardener, a role defined for him by his father, and that made him a detail person. Although he didn't like eating yams, kuv or parawog, he studied their growth and emphatically disagreed with what I was told by one of my best Wabunun instructors.

Chapter 1: RETURN TO THE GARDEN: Gwed, locating intentions and interpretive puzzles



1995, Iwa. Gweda seedling planted next to taro, left and right of squatting man, and tapioca in foreground.



Iwa, 1995. Gweda seedling planted proximate to three stake yams. Note how clear the soil is.



A process of planting taro, and potentially yams as well, kiumaun. Sipum explained this to me... it amounts to covering the area surrounding the seed, and stalk in a case like this of taro, with nearby rubbish to protect the soil, and plant, by preserving its moisture. These are considered excellent practices in Muyuw, and not infrequently seen. The consequence of this is that garden surfaces appear to be much more cluttered than regularly seen from Iwa and Kitava and on to the Trobriands.



1996, Gwed, Rhus T. ablaze with white panicles.



Kwadoy – the Woodlark cuscus (*Phalanger lullulae*), courtesy of Tim Flannery.



Kwadoy – the Woodlark cuscus (*Phalanger lullulae*), from Nasikwabw, 2002. The Nasikwabw kwadoy are said to taste much more bitter than those found on Muyuw because they eat more from Nasikwabw's kausilay, (*Calophyllum leleanii* p.f. stevens) rather than gwed and other early fallow trees found amongst more serious gardening villages on Muyuw's main island.



1995, Wabunun: 'You don't believe? Come and see, 1. Vesop [*Alocasia* sp.] at base of tabnayıyuw [*Dysoxylum papuanum* (Merr. & Perry) Mabb.]. To its left a betel pepper plant is starting its climb up the tree.



Left: 1995, Wabunun: 'You don't believe? Come and see, 2. Sipum and Mayal showing author a vesop [*Alocasia* sp.] planted proximate to tabnayıyuw. Right: 1995, Wabunun: 'You don't believe? Come and see, 3. Vesop [*Alocasia* sp.] planted in same garden at same time far from tabnayıyuw.



1995, Wabunun: 'You don't believe? Come and see, 4. Vesop [*Alocasia* sp.] planted next standing tabnayıuw; to the right of the tree are three dead trees that served as yam stakes. The yams' dead vines are visible beyond the top of the picture. Few regular yam stakes are more than 2 meters high. Along with the *Alocasia* plants that tower over these two men the extraordinary yam vine growth gives testimony to the tree's effects.



2002 Gwed test: Above line made from sugar cane tubers are from 10 or more meters from any gwed; those below are planted next to gwed. All kuv are from individual holes.



1996 Iwa yam. The enormous size of this yam derives from the pruning process that begins with Iwa and extends to the Trobriands. This man did not think this teytu was particularly big. Judging by Muyuw standards, I thought it was enormous.



1996 Iwa, garden fence in Iwa "village."

Chapter 2: THE TREES—Basic Categories

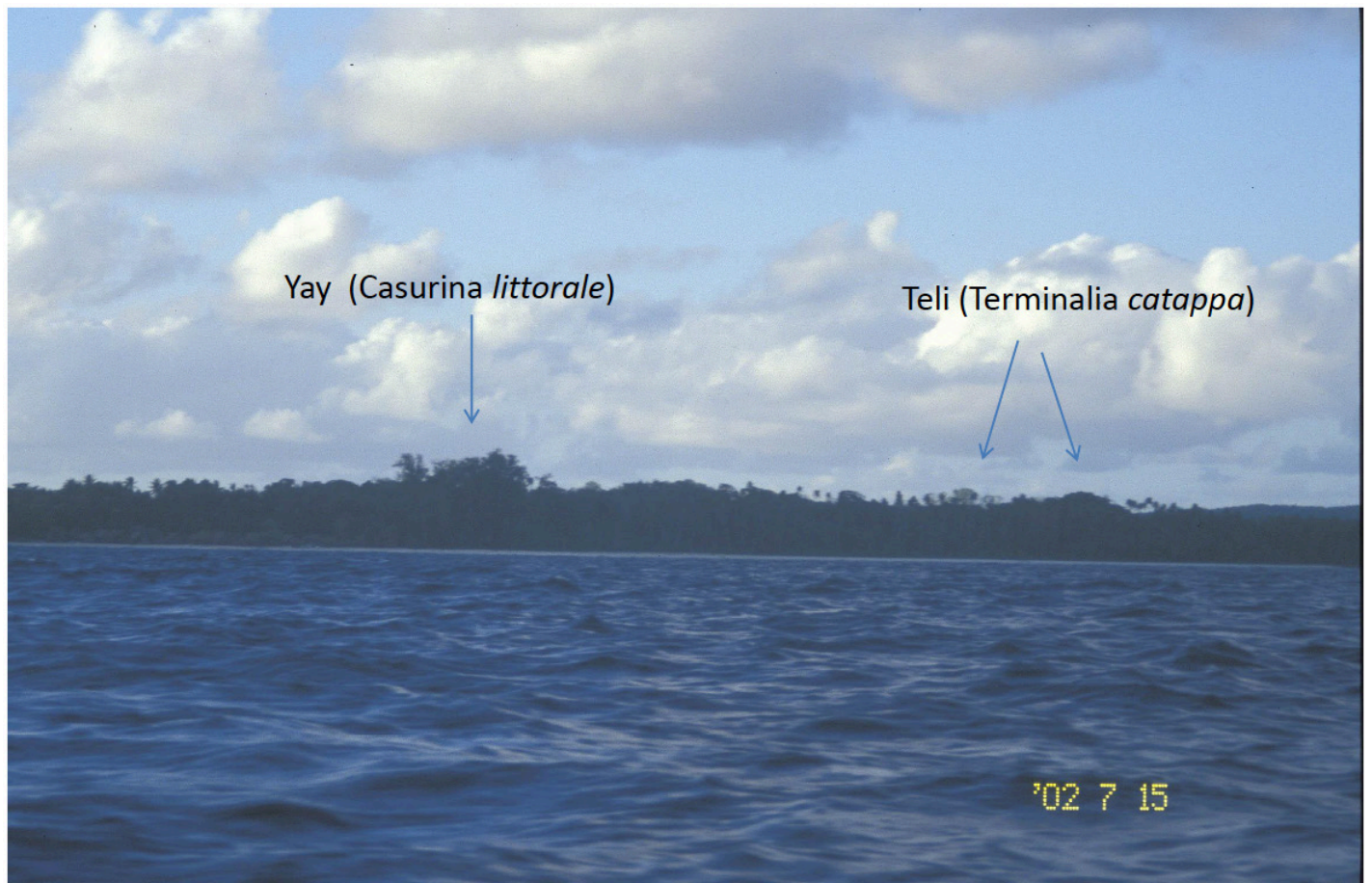
Chapter 2: THE TREES—Basic Categories and Landscape Beacons

“...the special distinguishing characteristic of Malinowski’s field technique lies ... secondly in the theoretical assumption that the total field of data under the observation of the field-worker must somehow fit together and make sense” (E.R. Leach 1957: 120).

“It is important to describe folk taxonomy, but it is equally important to document how folk taxa are used in everyday thought and interaction with the world” (Coley, Medin, Proffitt, Lynch & Atran, 1999:228)

INTRODUCTION

One evening in 1974 and that teili tree.



1) Wabunun shoreline from 2002, taken from Waviay. Dimly, village houses are to the left. Just to their right is a clump of high Yay trees (*Casuarina littorale*), a kind which once lined many shoreline locations. Far to the right are several trees rising above all others. One of those is the teili tree (*Terminalia catappa*).



The Teili (*Terminalia catappa*) tree at breast height, part of the unumug constituting the founding moment and place of Wabunun village.

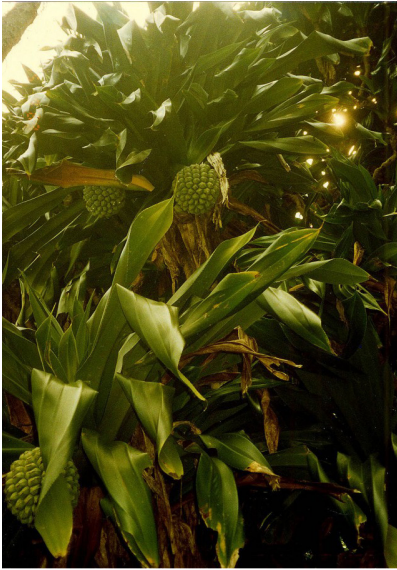


View of the upper portion of spreading Teili tree, part of the unumug...

THE TREES: THE PROBLEM(S) OF CLASSIFICATION AND CATEGORIZATION

The nature of Muyuw/NE Kula Ring Classification

Classing Life Forms



The shoreline pandanus tree called loud. Its aerial routes are the source of the finely textured “string” called im which may be used for the string in a veigun, the Kula Necklace, as the thread for sewing together other pandanus leaves for sleeping mats or sails, fishing nets in north central Muyuw and as the preferred string for “string figures.” The string can be very small yet when three pieces are woven together they are relatively strong and exude a friction that makes them easy to manipulate. The name loud is also applied to traditional belts and groin-covering apparel worn by men. When properly cured (by fire), the large leaves from this plant turn into a soft, pliable, almost leathery quality. To the right: Aerial root growing down from the trunk of a loud pandanus tree.

GROUPS OF RELATED PLANTS



From 2009, Akisi, one of four in a group (bod) of which three are strangler figs (MORACEAE Ficus. sp.). Sometimes this one spreads all around rather than in this tight weave. Leaves from this tree are used in love magic with the idea that its properties, binding until death, may be conveyed to a couple ...so that they stay together until death.

Kweita tayp' and names



The weylau female tree
(STERECULIACEAE
Abroma augusta).



The weylau male flower(MALVACEAE Hibiscus).



From 2009: A kind of landscape beacon, this is one of three proscription-signaling plants called kaypwadau, this one (ORCHIDACEAE *Spathoglottis*) frequently found in disturbed areas typical of digadag, early fallow garden areas, and the paths that regularly go to them. This is the same environment where Namonsigeg are found. Surrounding the plant here is another called Aydigadag (POLYPODIACEAE *Microsorium* cf. *cromwellii*). The kaypwadau in this picture is some 20cm high.



Namonsigeg, PASSIFLOREACEAE *Passiflora* sp. A commonly found early fallow vine whose wickedly suggestive name some believe to be a subtle hope, and vehicle for everlasting marital bliss.

Toward the Synthetic Use of Arboreal Categories

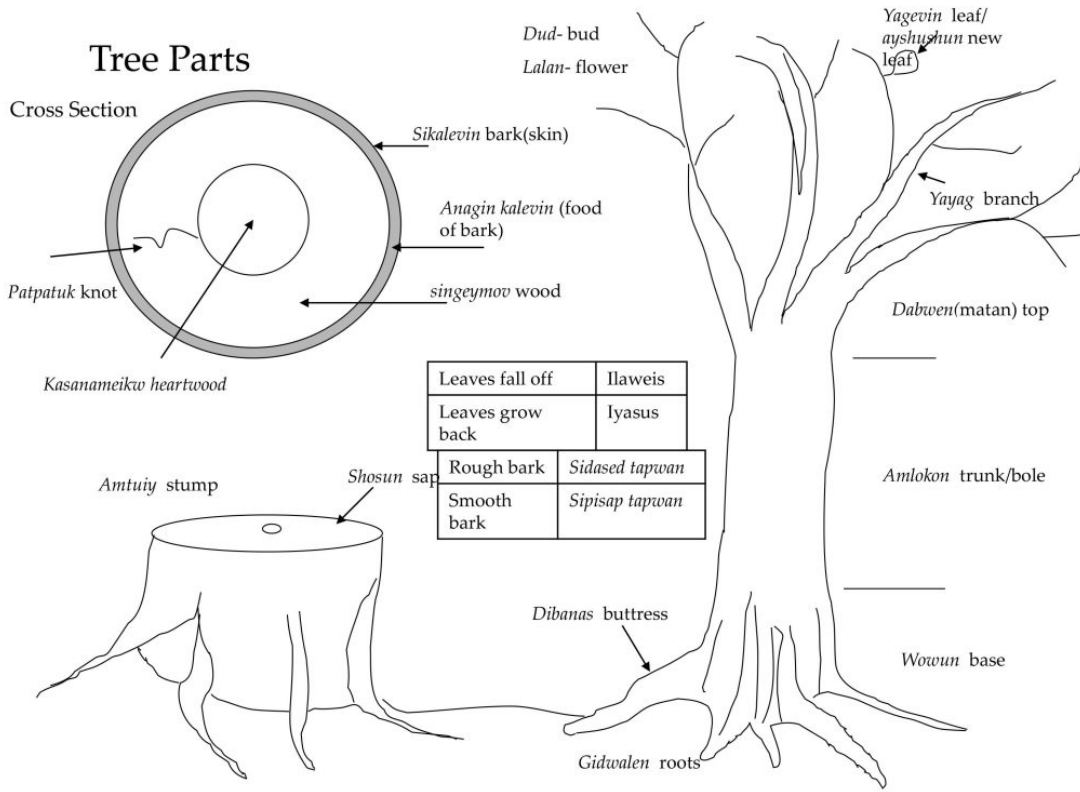
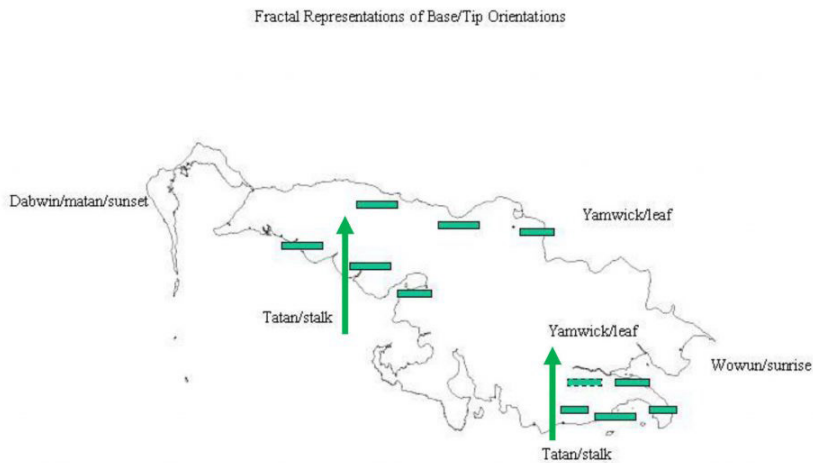


Figure 2.1 Tree Parts and Terms. Fundamental terms for trees and their parts, a logical beginning to a recursive ordering.

Map 2.1: Fractal Representation Of Base/Tip Contrasts



Map 2.1 Fractal Presentation of Base/Tip Contrasts. The ideal image of tree overlays the whole island so that the eastern end is the “tree’s” “base,” the western end is it “tip.” That imagery works for each village in the same way, in Eastern and Central Muyuw. The ideal two-rowed village is reproduced, also in Eastern and Central Muyuw, by means of an image of a taro plant by figuring a southern and northern line of villages. The southern line is the stalk, equivalent of “base” here; the northern line the “leaf,” yamwik, the word for large, broad leaves.

Chapter 3: THE FORESTS and FIRE: Tasim, Inverted Landscapes, and Tree Meanings

Introduction: "Trees" & places



From 1996: Clump of Mangrove trees in a kayel in South Central Muyuw



Canarium nuts resting in mud beneath mangrove roots in southcentral kayel, excreted there by a bwaboun (probably a Pied Imperial Pigeon).



Canarium nuts and a single niniwous (*Cryptocarya* sp.) nut to the right from South Central Muyuw kaylel.

Places, "...kaynen"



Kadidulel landscape. A typical view of what kadidulel plants look like. A type of pandanus tree called Yagal is towards the top right of the picture. In the Muyuw understanding over-gardening has permanently changed these areas so they no longer go through normal fallow sequences. My impressions from 1982 to the present are that the Muyuw observations are correct; unlike most other places, these regions appear not to change over the years.

Tasim



Classic Trobriand landscape, garden land mottled by usually single-standing trees.



A Trobriand village surrounded by economically significant trees then extensive garden land.



Trobriand landscape with Tawala (tawan in North Central Muyuw) with higher trees lining the higher eastern shoreline.



From 1996: Fenced garden area to the right virtually within the northern most of Iwa's two "villages," somewhat artificial concentration of houses.



From January 1996: one of several pictures taken to show the sense of an Iwa “village” almost being experienced like a forest.



2006 aerial view of southeastern end of Muyuw looking west towards the Sulog mountains across the top center of the picture. The mottled look is largely from the intentional tasim orientation. Stretching to the top right is the area called Kweyakwoya much of which has not been occupied or gardened since the 1890s. One informant, Aisi, Dibolet and Sipum’s father, told me that this whole area is a “sigob,” a once burned and planted area however much most of it now is mottled or filled with high (40m+) forests.

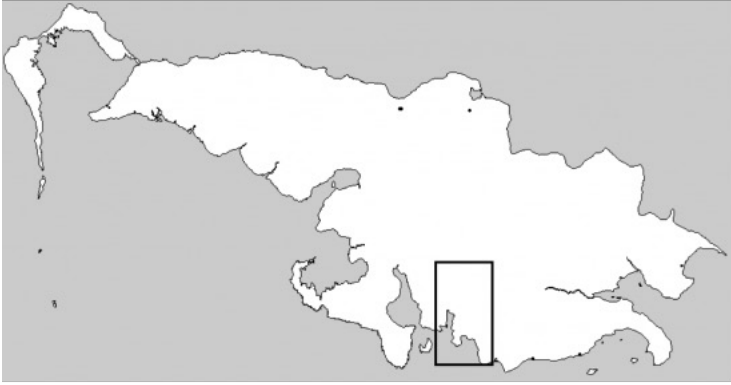


A shot of southeastern Muyuw gardens and forests with clumps of higher forests, tasim, breaking the lower areas lying in fallow. The picture is five or so miles west of the preceding picture looking south into the area Wabunun and some hamlets west of it cut and plant. The higher forest in the foreground has undoubtedly been cut but not in a long time and never repeatedly. North of where the picture ends leads into to what was the western extension of Kweyakwoya. Long, long ago it was settled.



Kwadoy – the Woodlark cuscus (*Phalanger lullulae*), from Nasikwawbw, 2002. The Nasikwawbw kwadoy are said to taste much more bitter than those found on Muyuw because they eat more from Nasikwawbw's kausilay, (*Calophyllum leleanii* p.f. stevens) rather than gwed and other early fallow trees found amongst more serious gardening villages on Muyuw's main island.

Sinasops and Demia Vek/Dum—the inverted landscapes of the sago orchard system



Left: The main island of Muiw with Mwadau Island left/west. The blocked area is more or less the region shown in the 1960s aerial to the right. Sago orchards dot areas both inside and outside the box to the west, north and a few to the east. Right: Bungalau and Salayyay sinasop/meadows, west and east circles. The two North Central Muiw meadows examined in 2009 are approximately half way between the northern end of the rectangle and the north-central shoreline, thus on the western flanks of Mt. Kabat. There are meadows east of Kabat.



From 2002: The Creator's Sago Tree in Bungalau sinasop/meadow. This tree's immediate predecessor stands to the right.



From 2009: Alanay Lituk (stream) meandering through mangrove swamps proximate to sago orchards. Waters flowing from and through the meadow Bungalau feed this stream. At least four species of ocean fish regularly swim up this stream, some appearing in the hole in the Kweybok region called Nabulkwakwit.



From 2014: Looking down to Nabulkwakwit, the reputed source for Alanay stream. It is within a few hundred meters of the northwestern end of the Bungalau meadow. Species of fish found in tidal waters often swim up to this point. Are the nearby meadows open windows to more easily catch rain for streams such as Alanay?



2002: Looking to the eastern “base”(wow-un) end of Bungalau sinasop under the Creator’s sago tree. The first line of high tree growth consists of sago trees lying in swamps just outside of the meadow. Towering above them and further to the east is a single Calophyllum tree of the kind Muyuw call Dan with its typical Christmas-tree shape. There it “kayamat,” ‘waits on’ the sago trees beneath it.



From 2009: Along with the swelling evident before it flowers and fruits and the way new trees bud off the base of a mature sago tree, the spines found on most Muyuw sago trees give the plant what Muyuw consider to be female characteristics. Over my four years on the island more than once some man returned early from the sago swamps because of a wound, which then became infected, from these spines.



2002. With a sago pounder, labus, standing inside a split open sago tree turning the center of the tree into a coarse, flaky sawdust.



2002 Sago production; pouring water into the sago mash from the nearby Sinkwalay River.



From 2006, in a production site too far from the Alanay stream to get water from there so simply pulled from the water table which is virtually at ground level. A slight indentation was made in the ground. There is much sand near this portion of the Alanay river region, sand that was probably extracted for making pottery when Muyuw people were also potters, perhaps 500 or more and 2500 years ago. Sago from this area is often said to taste gritty, though good, from the sand of the region. The pile of worked sago sawdust is behind the producer.



Sago production close-up of sieve-like structure.



From 2006: Elam, a young Kubay man from Wabunun kneading sago mash to separate out the carbohydrates. Once water is poured on the mash there is a strenuous pushing –a thrusting of the man’s whole body into the mash– and wringing for separating the carbohydrates from the chipped, shaved and splintered sago material. He considers the contraption he is working on to be feminine, he is the male source of power, the sago filling the trough below him the child/product of this particular female/male combination.



From 2002: Packing sago into a flour bag... the common way of transporting the material now. As the liquid flows from the frond into the trough it gradually separates, the sago flour sinking to the bottom, the water eventually spilling over the sides of the trough.

From 2009: Talibonas from Kaulay village in North Central Muyu, Wamwan, my primary Kaulay host from 1996 on. He holds leleiy amidst signavan in the central Muyu sinasop, meadow, called Diguwamwan, South of Kaulay.



Talibonas's son Henry from Kaulay village amidst kokoyit (sasi in Wamwan) in Diguwamwan, South of Kaulay in Central Muyu in 2009. Kokoyit is the fern from which dark inner bands are extracted for making the bands used to encircle various parts of the body.





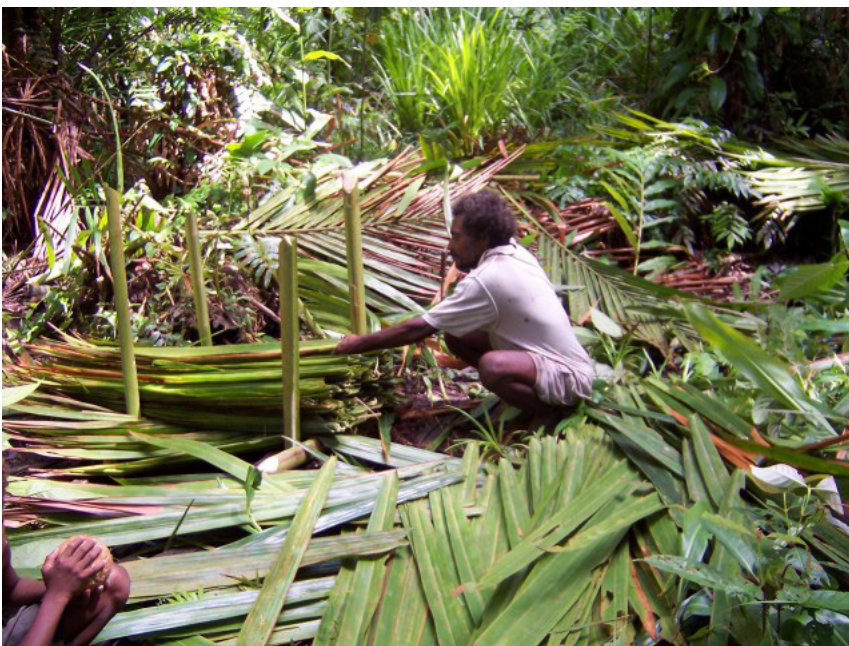
Diguwamwan meadow in Central Muyuw with Mt. Kabat, the moral center of the island, rising up in the top center of the picture. As can be seen, this area has recently been burned. All sago orchards near this meadow were down slope from it and several very close to it.



From 2002, burning the western end of Bungalau during the dry period of the minor ENSO of that time. It was not dry enough for the fire to spread to the eastern side of Bungalau. By 2009 the burnt area looked like the unburned areas to the right. By 2014 it was all but impossible to move through the place because the vegetation was so dense.



2009 Koliu drying in above the fire/cooking place in Talibonas's house in Kaulay village, Central Muyuw. This vine-like fern is frequently found and gathered from meadows, then dried in rafters until it needs to be used for tying various parts of outrigger canoes.



From 2006: Packing sago leaflets into a form for roofing or siding material. Sipum carefully stacked sago leaflets to conform to a male (up) female (down) pattern that will eventually be bundled and carried to the village for roofing or siding material. Men sense women watching over their work and ready to scowl at them should they find the leaflets not packed for the most efficient removal when they are sewn onto a rack, a couple of meters long, to be used for a house roof or side.



From 2009: a rotting upper part of a sago trunk, split open, worked, ravaged by “wild pigs” then left to rot to facilitate the next generation of growth.

Trees and the Construction of Social Discontinuity



Crisscrossing poiya structure viewed from the intersection at the top-center of the house created with the akidus tree (*Rubiaceae*). For the same reasons it is used for this house part, balancing dangerous wind dynamics by virtue of its arcing form, this well-known old forest tree plays an equally prominent and well-known role in the anageg class of outrigger described in Chapter 7.



From 2002: the three kavavis carried by the anageg Levanay. Composed only of meik/ Intsia bijuga, the rudder-like structure used to steer the largest class of outrigger. Most boats sail with three, two well-formed, a third used only if one of the first two snap from the force of a wave. Women are likened to kavavis for their analogous role in houses –directing its course given divergent forces. It is widely known that the tree used for making kavavis is the ritual firewood for Koyagaugau and Ole, the northern most island in the Lolomon/ Bwanabwana group. The looming trees in the upper left background are Kiyay/Yay trees, *Casurina littorale* sp. once common on Muyuw shorelines now clustered at Wabunun's eastern boundary.



From 1996, a Kaulay, north central Muyuw, yamhouse constructed with gwed sol, the two beams running across the two sets of uprights holding up the structure. The lighter quality of the construction materials makes it easy for four men to left the container structure off its four posts and carry it the short distance to a new garden for storing the next year's yams.



From 1996: Iwa yamhouse framed with trees designed to last from one year to the next, though the structure is re-enclosed every year before it is ritually loaded with new prestations of yams. Pandauns leaves or woven coconut fronds form the usual covering.



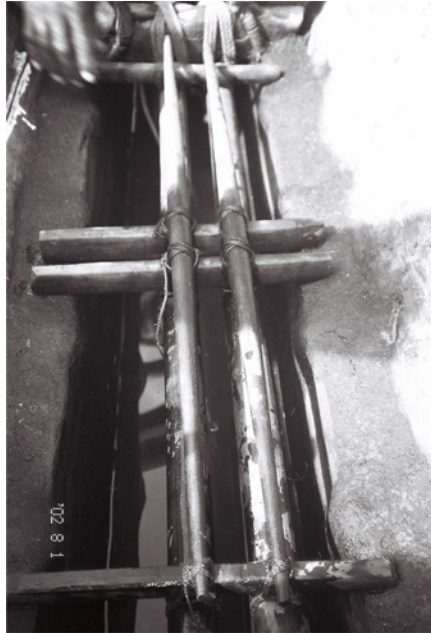
Atuwaman (*Chionanthus ramiflorus* (Rox.)) stored proximate to a house while materials are assembled for a small ritual (For Sipum's second deceased son 2002.). This is in Wabunun where Atuwaman is the ritual firewood. Firewood is regularly stored under houses but only tends to be exclusively Atuwaman in Wabunun when it is to be used for a ritual.



1996 An atuwaman (*Chionanthus ramiflorus* (Rox.)) girdled (isel wowun), in a recently cleared digadag forest to speed up its availability for a prestation.



Vekwaya, my primary Kaulay (North Central Muyuw) teacher from 1974 to 1995 standing next to a bundle of Mamina (*Syzygium* sp.) bark, Kaulay's ritual firewood.



Top center: Towards the back side of Boagis village (Southwestern tip of Muyuw on Mwadau Islan) clusters three enormous trees, two kaboum [*Manilkara fasciculata* (Warb.) H.J. Lam], one meikw (*Intsia bijuga*.) define the village's place in the regional system. Kaboum is Boagis's ritual firewood. Meikw is the ritual firewood for Gaboyin/Koyagaugau the northern most island in the southeastern corner of the Kula Ring (from which some Boagis people come). Everybody knows that kaboum is the tree of choice for what most people consider the most important part of their canoes, the two tapered pieces in the lower left picture, the heart of the boat's mastmount and discussed in detail in Chapter 7. Kaboum is also used for the 44 parts/boat called watot used to connect the cross-beams, kiyad (booms), to the outrigger float. Four of these are evident below John, from Wabunun, holding the kavavis, steering mechanism, 8c. As noted in the text, kavavis are carved from meikw. Thus the firewood usage enshrines Boagis's primary role as sailors connecting the southeastern to the northeastern corners of the social system.



January 1996, On Iwa: Tawaku (*Terminalia megalocarpa*) nuts from one of the island's two ritual firewood trees. These nuts have been cooked, in an earth oven, and are now being prepared for soaking in the ocean for several days before they can be eaten.

Chapter 4: A STORY OF CALOPHYLLUM: From Ecological to Social Facts

“One way indeed in which signs can be opposed to concepts is that whereas concepts aim to be wholly transparent with respect to reality, signs allow and even require the interposing and incorporation of a certain amount of human culture into reality. Signs, in Peirce’s vigorous phrase, ‘address somebody’” (Claude Levi-Strauss, 1966: 20).

“Part of the problem faced by ethnobiologists was that they were narrowly comparing Linnaean taxonomy with particular folk ... domains and not looking at language more broadly... These are all cognitive processes (means, agents, instruments) which help us first comprehend the world and then negotiate our way through it. They do so by acting on and through existing sets of beliefs or representations (the medium) and influencing the generation of new ones; indeed, they are the co-ordinates which determine how much of what comprises belief is expressed and represented.” (Roy Ellen 2006: 176, 185).

INTRODUCTION



2009. My son, David Dibolel Damon, standing next to the largest Kakam, *Calophyllum Inophyllum*, I’ve seen to date. On the north coast west of Kaulay’s lagoon at a place called Ulgulag, the location of a strange grove of kausilay.



Early 2002: A recently pruned Kakam near one of Gawa’s main landings. Many of its branches had just been removed for an outrigger canoe Gawan people were making for people from Iwa.



From 2006, a landing near the sago swamps and orchards in South Central Muyuw, showing how a Kakam tree's roots are understood to support the shoreline.

THE GENUS CALOPHYLLUM AND THE RECENT HISTORY OF WOODLARK ISLAND

Taxonomy, Evolution, Distribution & Asia-Pacific Names



Flower of *Mesua ferrea* (left) and *Calophyllum Inophyllum* (right). These closely related trees may also have had related usages in South Asia and Southeast Asia extending throughout the Austronesian world, that possibility perhaps also realized in roughly similar names applied to the different trees in the Iban language of Borneo.

“Now, the characteristic feature of mythical thought, as of ‘bricolage’ on the practical plane, is that it builds up structured sets, not directly with other structured sets,* (note omitted) but by using the remains and debris of events...” (Levi-Strauss, 1966: 21-2).

THE “GROUP”

Kakam



‘Madiu,’ now (2006) a Wabunun elder recently retired from the United Church, working on a tabuiy, a front and tail piece fit into the keel and jammed up against the Kunubwara, prowboard, to hold it in place. He works with an adze made from a kakam (*C. Inophyllum*) branch with a metal blade tied onto it, the fitting identical to the older use of stones. This is a light tool used in ways like both a chisel and plane, i.e. for making fine, graduated changes in the parts it shapes.



1998, an anageg waiting to be refit (it never was) but showing the architecture of the ribs (gulumoms) and the degree to which the left side, facing the outrigger float, forms a different angle than the opposite side. Each piece forming the ribs, 20 altogether, must be differently shaped.



2006 picture of yelum, baler, cut from a kakam root designed so that it can be easily held with one hand for a scooping motion into the trough cut into the keel. Note the meeting of the two ribs visible behind the baler. The order of their placement with respect to one another should be reversed so that, for example, on the stern end of the boat the rib on the side of the outrigger float is behind the rib coming from the opposite side. Then just past the center of the boat, where the mast mount is located, this order should be reversed.



From 2002, top, created from kakam, the kuk structure is supposed to be a rooster. It is held in place towards the top of the mast by means of a mortise joint. It is pulled up by a line called balau powan; it is pulled down by the other line evident in all three of the pictures here. Altogether the form functions like a pulley for raising the sail. The imagery and meaning of the piece are discussed further in Chapter 6. See images larger: TOP LEFT RIGHT





From 2002, the kunusop and duwadul structure. To the left is the kunusop being tied into the bottom center of the boat. The mast fits in the hole. To the very right of the hole the beginning of the duwadul structure is evident. It rises along the outrigger side of the boat and arcs over the outrigger platform, as evident on the right. Although most kunusop/duwadul structures are cut from a single branch, this one has two pieces spliced together.



January 2007, Ogis holding one of four model sails made for me since 1999. The asymmetry of the rounded edges is evident. These are said to be modeled after the shape of a kakam leaf.



1996. *Calophyllum Apul* rising above Talibonas and a relatively high canopy behind him.



January 1996, a Kitavan boat-house and its recently decorated masawa/tadob outrigger. The keel/hull is to the left, the outrigger float behind the men sitting to the right. Too narrow to be stable, from a Muyuw perspective.



From Kausilay to Apul, the contrasting design features of the eastern and western outrigger forms. To the left, from 1998, a Nasikwabw anage constructed from an arcing kausilay bole being pushed out so its sail can be raised. Note the pronounced upward arc of the keel. To the right, 1996, a Trobriand masawa/tadob presumably constructed from an apul or apul-like bole being loaded so that it may be paddled from this northern Kitavan landing back to the Trobriands (Vakuta).

Dan



2002 A large dan downed in 2002. Most do not have root structures like this one but they do often have roots that protrude above the swamp water in which they often grow.



From 1998 just before a squall begins to govern the canoe's passage. The picture was taken to show an arc visible toward the top of the mast...a quality selected for among the two species, ayniyan or aynikoy. Over and above its initial positioning, the top of the mast should visibly sway to facilitate wind spilling out of the sail.



2002 On the way toward the top of a Sulog ridge which aynikoy were to be found a small and/or young plant of the pandanus form called Legis, the principal pandanus type used for making the anageg sail. Sail construction is detailed in chapter 6. Gaps in the Sulog canopy explain the appearance of the plant, as I observed them and as Muyuw people understand the phenomenon. They are another kind of patchy phenomenon, fundamental to the organization of the social system.



2002, atop a ridge at Sulog. After cutting one tree he soon found unsatisfactory, Duweyala went down a path to cut this one.



2002, Duweyala with new (aynikoy, redder, on left) mast (vayiel) and the old (from kausilay, lighter on right) one. I left Muyuw in August before he had completed trimming it so do not know its final dimensions. It reportedly worked fine.



2002, a Nasikwabw anageg beached on the main Nasikwabw landing showing the bis, the yellow plastic telltales, here yellow strips of plastic, tied to cowry shells on the craft's front. It is evident that this is the front because the snake etched on the face of the prowboard, kunubwara, is only put on the dabwen, top end of the of the craft.



2002, moving from Nasikwabw, in the left background, to southeastern Muyuw, with bis, the yellow plastic telltales, streaming to the rear.



2002, sailing from Panamout to Nasikwabw before the mast snapped. The sail is low on the mast, the bis, telltales, here pandanus leaves, shooting straight out in the strong wind. The person holding the kavavis, “rudder,” watches these looking for kubub, eddies off the main direction of the wind, which might reverse the pressure on the sail capsizing the boat.

Kausilay



2002. Koyagaugau (Gaboyin or Dawson Island). Top, Lobo his wife and child, holding the “base”, back end, “bird” for one of his anageg (around which is draped the very famous veigun/necklace Lapwayat). Lobo is one of the Koyagaugau people who holds a small mortuary ceremony for the end of life of his anageg keels. Right, Gideon (“Talopet” from ‘interpreter’ for Muyuw people), the older brother of Duweyala, the owner of Lavanay, the anageg I sailed on to Muyuw. Gideon is sitting on an old keel from one of his anagegs. Left, another of Gideon’s old keels resting in a stream that drains an interior swamp. The stream has magical qualities used for departing crews.



On discovering the socio-ecology of the tree: Events to structures—shape



1996, a few kilometers from Wabunun, the classic arc I learned to recognize as the shape of kausilay



2002, a Nasikwabw kausilay downed and waiting to be carved. The end of the southeast wind, from August on, is slated as Nasikwabw's time for boat work since it is often too rough to be on the seas. So while walking on the island in July of 2002 I noted a number of trees that had been felled for later work.



1995, a kausilay near Wabunun reserved for Di-bolel's use some time in the 1970s. Since he is one of the few people alive with the skills needed to carve Wabunun's most sophisticated kaybwag, the middle class of outrigger, people remain (in 2012) anxious for him to turn this tree into a keel.



1998, side view of the partially dismantled anageg shown and discussed earlier. This angle shows the arc desired for the form. The arc must come from the heart-wood of the tree.

Configuring a Transformation

Element in a Resource System



On the left, from 2002: By the late 1990s money from logging and gold mining explorations had radically increased the number of chain saws distributed throughout the island making taking down large trees a new and different experience—of and about time and power. On the right, kausilay (*C. leleanni* p.f. *stevens*) one of many trees downed for recent gardening activities showing its blood-red color and a thin band of yellow sap. People talk about “wasting” these trees because they are not being used for anything. Some youth discuss the cutting with a kind of evident joy... Others, by 2012, are anxious to use walk-about saws to turn such logs into timbers for their houses. People also have noted a serious decline in the kwadoy population. Elders (after 2000) recall times when they could go and find many at a time, “10, 20...” Now many people blame the kwadoy loss on the Oxford study of the island’s population more than a decade ago.

Boundary marker



2002, the Ole anageg Lavanay beached on Wabunun’s landing showing the ‘horizontal’ arc of the keel. Each end not only veers up, it is cut so that it turns slightly towards the outrigger float. Lavanay’s outrigger side here can also be seen to be turn out more towards that side than the more vertical opposite side.

Kausilay as a Person



July, 1996, two kaybwag class canoes/keels on Wabunun's landing. To the left the reddish kausilay; to the right the white aunutau.



Kausilay (*Calophyllum leleanii* p.f. stevens) stump, its red interior and yellowish sap evident. Although people can associate the red color with menstrual blood, hence connoting the feminine quality given to the tree, they also say the blood color is like the red color prominent in exposed thigh muscle.

Chapter 5: VATUL: A Life Form and a Form for Life

“Indeed, it might be said that the problem rendered spatially in the knot is not a problem that can be conceived experientially at all other than on the basis of binding itself; that is, it is unlikely that the knot is the result of a projection of pre-existing concepts derived from social-culture experience, but that it evidences a complex relational and transformational field which can be discovered simply by doing it and looking at it” (Kuchler 2001: 71).

Introduction



From 2006/7 and 2009, a younger and older akisi (Ficus) tree, which Sipum early on told me was a tree with a lot of “power.” The tree on the left grows amidst Wabunun’s garden areas, the one on the right is west of Unmatan along a path leading to some of its sago orchards in the swamps that stretch towards the Sulog peninsula. Because it configures entangling until death the tree’s leaves provide love magic thought suitable for entangling two peoples’ minds in one another.

Vatul as a Life Form, and Names



From 1974 or 75, Dibolel weaving new rope in Wabunun from the inner bark of the tree ukw (*Sterculia* sp.), the prototype for good material. Strips of the bark hang drying from the rafters above.



From 1996, Gumiya with im vatul: The vatul called im is extracted from aerial roots of the shoreline pandanus tree called loud. Im may be used for the string in a veigun, the Kula Necklace, as the thread for sewing together other pandanus leaves for sleeping mats or sails, fishing nets in north central Muyuw and a the preferred string for "string figures". The string can be very small yet when three pieces are woven together they are relatively strong and exude a friction that makes them easy to manipulate. The name loud is also applied to traditional belts and groin-covering apparel worn by men. The lower left picture shows a strand being pulled from a hacked off aerial root; although unfocused the lower right picture is an up-close view of the strands. The top photo is partially extracted and separated material from the loud aerial root ready to take back to the village for further refinement.



Tying and its Terminology

The vine called yoyit



From 2002, in an instant Gumiya collects yoyit (ARACEAE, probably *Raphidophora* sp.) to bring back to his house near Wabunun for any number of tying tasks. There are no formal rules for tying together the many different trees and parts that go into making a house but Gumiya's ties and knots always seemed more formally and carefully done than most.

Soul' as method



Fancy tying...From 2009, one of the pigs tied up for the Ungayay ritual for Sipum's death. Most of the lines and "knots" described in Chapter 6 are evident in this set of pictures. This pig was a case of somebody exhibiting their tying virtuosity, elaborations sometimes witnessed in houses as well. Such is called "kalimwasau," roughly "showing off."



From 2002, following correct order, Duweyala starting the tying of the kaynikw, the odd-shaped spring in the direct center of the keel upon which the kunusop rests. As per tradition, he holds the “koliu” in place with his left hand doing the tying, yawan, with his right.



From 2002, show the movement of the right hand, Duweyala works to complete the center tying of the kaynikw, the odd-shaped spring in the direct center of the keel. Once this is complete, he moves to the wowun end of the two pieces, then the dabwen end. They are both lower than the two cross-pieces shown here. These pieces were retied following our trip to Muyuw because it was felt they were too far to the bottom of this picture. They sit asymmetrically in the keel, slightly more towards the outrigger side of the craft.



From 2006-07: Top, tagegeyon tying of kiyad, the cross beam that is tied to the internal hull structure of the boat, sesuiy, from the right, going across and through the hull to the left extending out over the outrigger float where watot, from the Boagis ritual firewood kaboum, connect it to the float. Left: tagegeyon wrapping of kiyad as it passes over the outrigger side seysui through the hull towards the outrigger float to the left. Right: the kiyad attached to the right side seysui, opposite the outrigger float by means of a tagegeyon wrapping modified to what is called eyon tau.

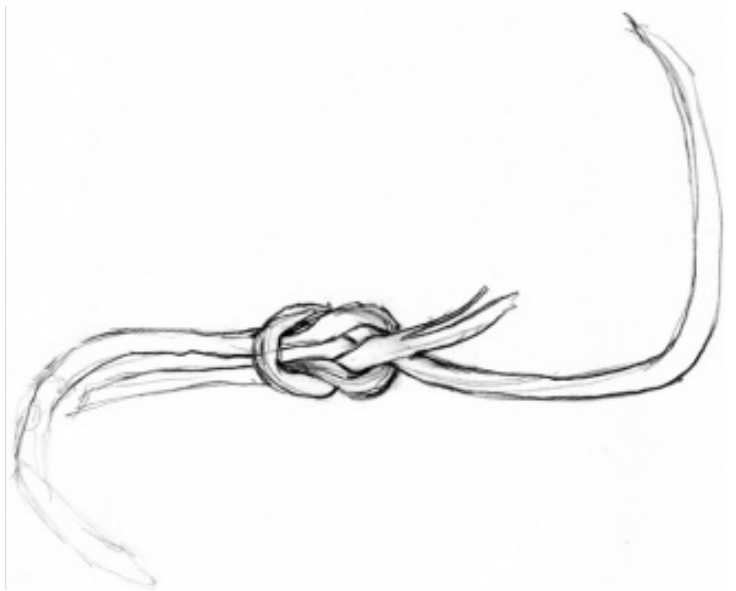


Tibwelon, arm (in this case, the specific term sasi) leg (kaykwas) or waist (palit) bracelets, made from the black inner strands of the vine kokoyit (*Gleichinia* sp.). Among other places, these were and still are frequently obtained from the meadows (sinasop) described in Chapter 3. Muyuw distinguish two kinds, kalamaganag and kaylogwaw. These pictures are of the kalamaganag type, and are the standard kind woven in Muyuw. The band (to the left) is about 8cm in diameter and 1.5 wide (to the right). I have seen armbands much wider than this one. And in the past both men and women frequently wore many of these items. People were once much more bound up than they are now, though the effect of tibwelon is still considered to be very becoming.

Sip vinay and sip tauwau



The sipvinay knot, thought to be ugly and the kind of knot women habitually create for short term purposes.



In contrast to sipvinay, “knot female,” this siptauwau, “knot male,” is the preferred kind and conceived to be more attractive.

Sipkwadoy and sipkibkeway and boat “methods”



Sipkwadoy knot, the fastening procedure for all animals and the anchoring tie for the kumis method of tying. It is named for the island’s cuscus (kwadoy: *Philanger lullulae*).



From 2002: Left, the kimbkeway “method” of tying, shown by the way the two sets of watot are tied to the kiyad, cross-beam, connecting the hull to the outrigger float. The end of the material in the green circle points forward, the end in the white circle points backward. This is to replicate the completion of a stroke when paddling the canoe.

Top right, kumis tying before Lavanay was retied in 2002. The photo is of the third kiyad (crossbeam) from the wowun, or back end of the craft, looking at the lam, outrigger float. The boat and float’s dabwen, the top or front end, is to the left.



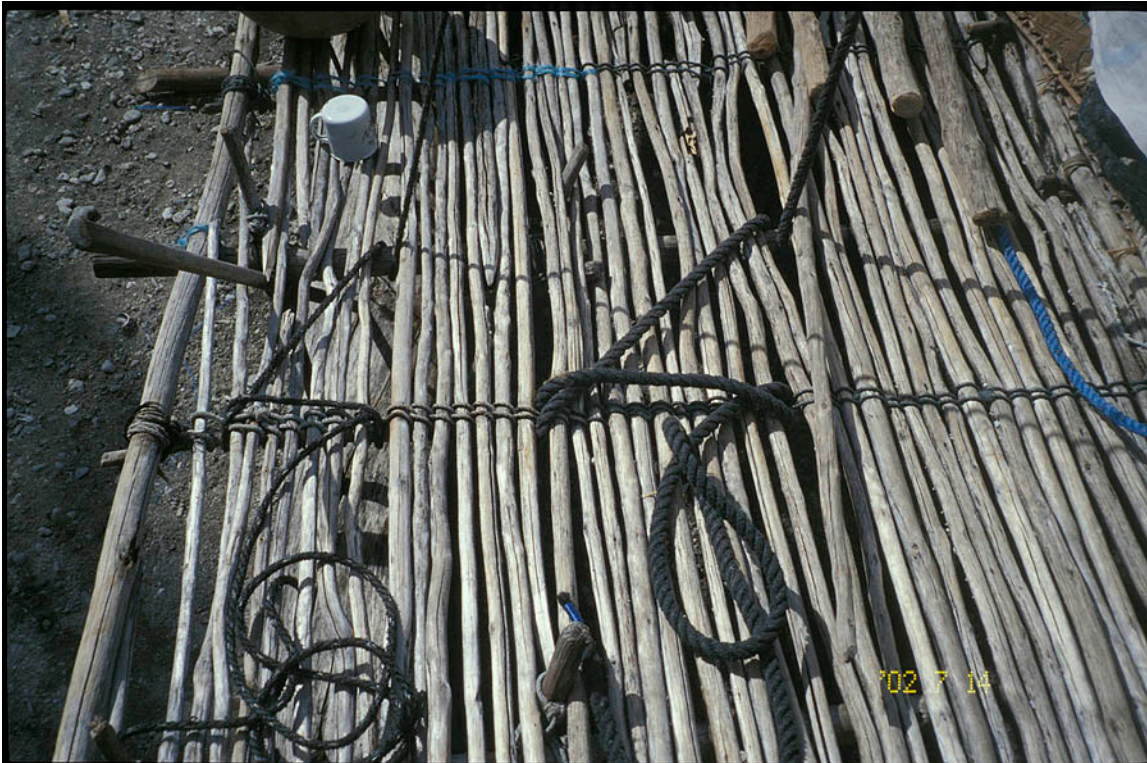
Bottom right: From after Lavanay has been retied, anageg crossbeam tying employing the kumis method looking from the wowun to the dabwen end of the outrigger float.



Model of a sipbalau knot, sequenced reversals.



From 2002, balau lines looped around top of Lavanay's new mast while in Nasikwabw. The sipbalau knot is named from this line. The placement of three sipbalau knots, one at the top of the mast, two on the outrigger platform, controls the degree to which the mast arcs toward the outrigger float and pivots more or less to the leading direction of the craft.



From 2002 voyage, the balau line fastened to the outrigger platform using three open loops to achieve its purpose—holding a position while being easily manipulated.

Lepwason and sail structuring



Model of the lepwason knot. In this model if you pull the short end the knot releases immediately; if you pull the long end it tightens.



From 2009, making a model sail. Legis leaves are edged with sharp burrs which must be cut off as the first step after gathering the leaves. On the left Lewovau, a Wabunun elder, shaves sides of the leaves with a small knife. To the right: Small pieces of obsidian can be found lying on the ground around many but not all contemporary villages—the Unmatan area is especially loaded with these pieces. Wondering if these might have been used for processing these leaves, among other things, I asked the women helping with the 2009 sail making to try using them. They could easily hold some of the pieces employing them for the task of shaving legis leaves.



From 2009, Ogis making (“burning”) a model sail. After collecting the legis leaves and removing the burrs that edge them, the next step is to pass the leaves through a fire then fold them up.



From 2009, Ogis making a model sail. Coupled and folded “burned” leaves are in the background. To prepare for stitching them together the leaves are sometimes attached by means of toothpick-sized sticks.



From 2009, Ogis making a model sail. With the stitching visible the front and backsides of the leaves are also shown. This is part of the system of reversals that structures the sail-making process.



From 2009, Ogis making a model sail: Ogis is organizing the curved end of this sail, its awomweg. Its asymmetry, the kakam rather than Budibud shark model, is apparent from the line he has scratched into the leaves as a guide.



From 2009, Ogis making a model sail: Vines or woven rope used to edge the sail and then encased by other material becomes both part of the internal structure of the sail as well as the means for constructing the external lines for rigging it to the boat.



From 2009, Ogis making a model sail: Coordinating internal with internal lines. When I first saw Ogis attaching the two ends I thought he was just winding the “rope” around the piece of rattan. But then I realized he was effectively turning what I thought was a simple revolution into a sipbalau knot by executing a series of reversals. When it is being made this form protrudes from the corner of the sail waiting the attachment of other lines.



From 2009, Ogis making a model sail: Pamaloul, slats that run the length of the sail's inside lap the curved ends of the sail after they fit under the peculiar stitching on each end named Vav takon, “centipede chest.” The centipede is probably *Scolopendra* sp.



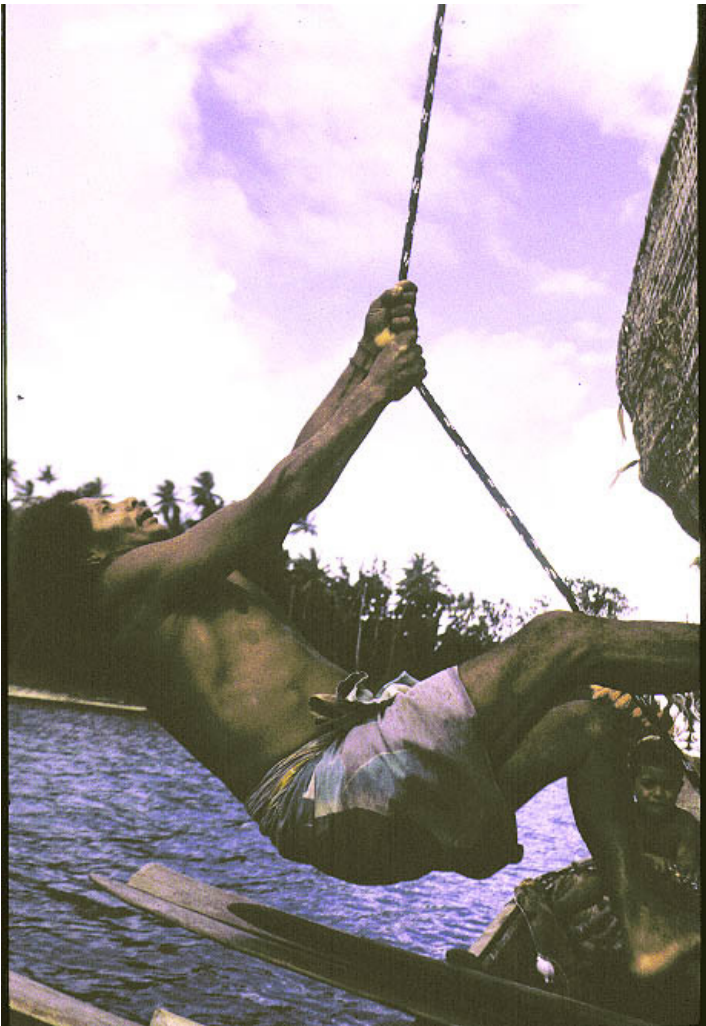
From 1998, on “Number 2’s” Nasikwabw anageg a man has climbed the mast to insert the halyard through the kuk in order to raise the sail.



From 1998. While “Number 2,” this anageg’s owner, is positioned opposite the outrigger float so that he can raise the sail by pulling on the halyard, these two men stand on the outrigger platform first supporting the sail then pushing it up with sticks.



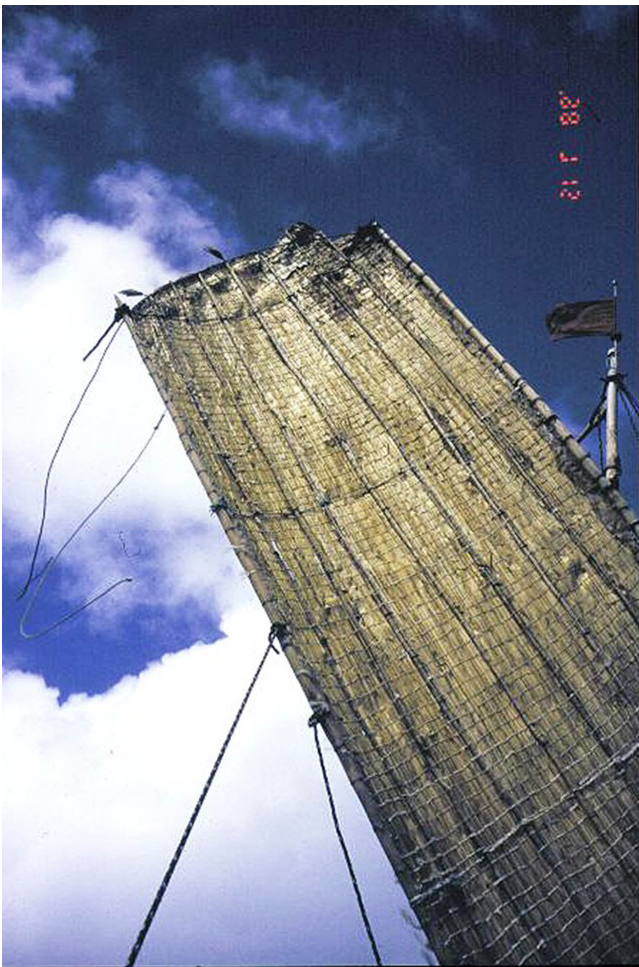
From 1998, Number 2 raises the sail for his anageg. Two people not pictured are on the far right with poles pushing the sail up. Number 2's right foot is on the mast, his left on a long plank, formed the boat's kavavis, placed across the beam of the craft. He raises the sail by falling/pushing himself back while hanging onto the halyard.



From 1998, Number 2 falling back as he raises the sail for his anageg. Two people not pictured are on the far right with poles pushing the sail up. As can be seen, two of the craft's kavavis, "rudders," serve as planks place across the beam of the craft for his support. "Vay, vay" is a shout called out by those watching and helping as he falls back to pull on the halyard which raises the sail.



From 1998, Nasikwabw anageg's sail is pulled high on the mast because the wind is light.



From 1998, the sail is set, high on the mast with a light wind.



2002, Onosimo, early in our voyage to Nasikwabw, before our mast broke, holding down the enay, unattached alita, because the wind was so strong. Compared to the 1998 picture of the sail tied high up on the mast, the contrary position is readily visible here.



2002, later in our voyage to Nasikwabw, after our mast broke, by means of the asan the sail is much lower on what is left of the mast and angled towards perpendicular, rather than parallel, to the mast. Its lower left end, rather than being tied near to the mast, is pulled out over the outrigger platform.

Vabod and fishing nets



From December, 1974, a day of collective work. Top: Unseen beneath the tree to left Aisi carves a kas, a trough for collecting sago. One of his elder brothers weaves a fishing net section to the middle left, the only man in the 1970s still wearing a loud. In the center background is one of Wabunun's two famous middle-sized outrigger boats, of the kaybwag class. It is being recaulked. To the right several men are putting the finishing touches on an aydinidin class sail, though one for a kaybwag not an anageg.

Left, on the December, 1974, day of collective work: Gisaw one of three elders taking turns working on the same net section.

Right, on the December, 1974, day of collective work: Takanayob weaves a the new net section. Another of Wabunun's famous kaybwag canoes is in the upper right. Its prowboardless end-piece, matsibod, can be seen. Chapter 6 discusses how this piece differs from its front end and anageg prow and stern pieces. It and another out of sight here were being recaulked. Already scraped pieces of wood from which the caulking material was extracted are on the bench where the children are sitting.



2009, Kaulay village, North central Muyuw. Talibonas holds a tikw, a Kaulay associated fishing net for sardine-like fish. Although the net is assembled and maintained through time, the frame shown here is made just before it is used then discarded.



Model of the vabod knot



From 2002, the vabod arrangement. Gumiya holds the sequence, each hand holding the beginning and end of the sequence in which the knot form appears.

Perspectives on *Vatul-Bitalik Non*



From 2002, pounding the yawasay tie into place around Lavanay's mast in Ole the day before our departure north. The crowd watching this was no less interested than the one that gathered the night before to participate in a string figure showing.



Left, from 2002, a moment of transformation encased in one of the more astonishing string figure episodes requiring riveted attention across several dimensions. Aligeuna is the women to whom friends directed me for expert performance of these forms. They—Sipum and Mayal, the men who made me disbelieve in magic in 1995—mouthed her moves as she went through them.

Center, from the 2002 retying of Lavanay, Duweyala straining as he pulls the rope—it is classed as mamad—to start the tying of the nedin to the duwadul. The four posts (taniwag) leading from the duwadul to the outrigger float are already in place. Marks from the previous tying can be seen on the wood near his feet.

Right, also from 2002 and a few moments after the center picture, tying the nedin onto the duwadul. The nedin is the white piece of wood running perpendicular to the duwadul which is now lapped by swings up to and back from the posts at the far right connecting the duwadul to the outrigger float. The twists and turns used for this complicated knot are no less daunting than the transformative intricacies in string figures.



From 2002, Aligeuna performing the kananik called Kalavis, “Paddle.”



From 2002, Aligeuna performing a katuvin, double reversal (from one hand to the other) in the Gumeau (Pleiades) sequence.



From 2002, Aligeuna performing Ipel kubwan in the Gumeau kananik sequence.



From 2002, Aligeuna performing Tautoul budibud plelidius, configuring black rays –light appearing as black–that shoot into the sky from the east blocking out the stars just before the sun’s first light appears.



From 2002, Aligeuna performing Bwiyam (day-break)... dissipation...and it is over.

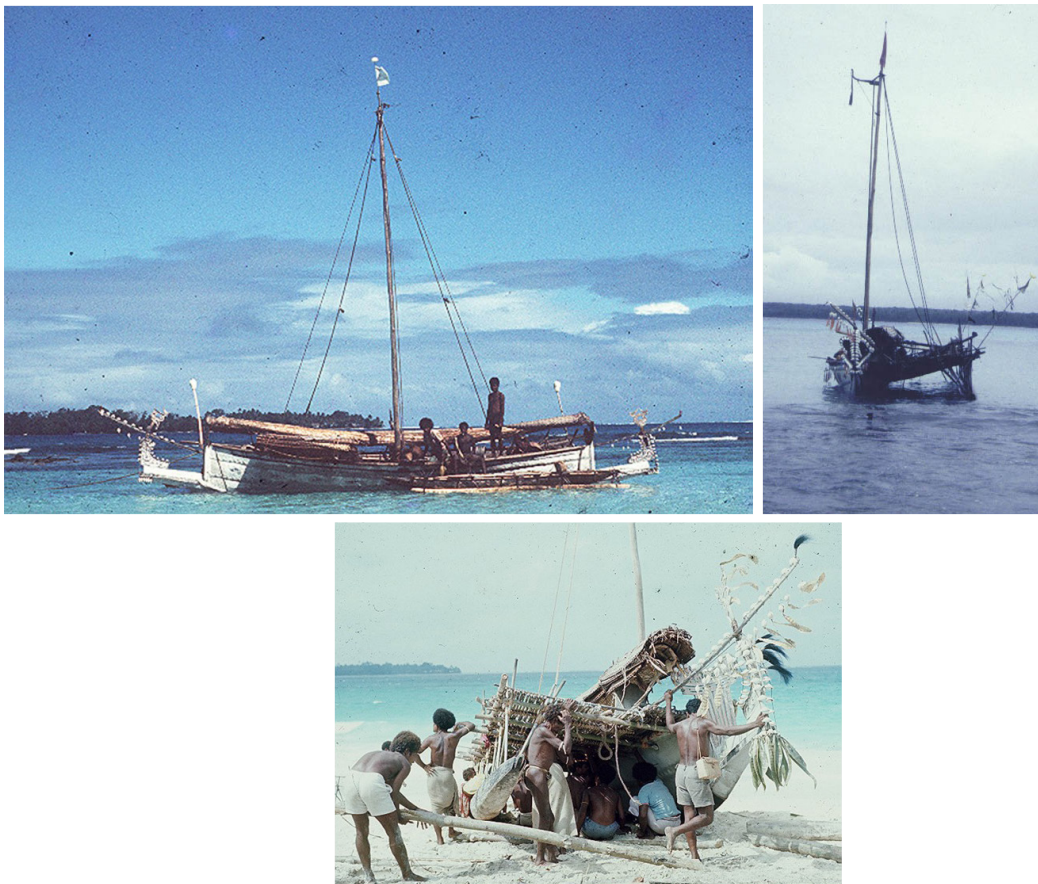
Chapter 6: GEOMETRIES OF MOTIONS: Trees and the Boats of the Eastern Kula Ring

“We have been trained to think of patterns, with the exception of those of music, as fixed affairs. It is easier and lazier that way but, of course, all nonsense. In truth, the right way to begin to think about the pattern which connects is to think of it a primarily...a dance of interacting parts...”Gregory Bateson, *Mind and Nature* (1979: 13) quoted from El Guindi, Fadwa 2008 BY NOON PRAYER: The Rhythm of Islam Oxford and New York: Berg Press

Fred: “When Lavanay (a twenty year-old anageg/Kemurua) wears out what will you get next?”

Duweyala, the anageg/kemurua’s captain & owner: “A dinghy and a 50 horse power Yamaha.”

I. Introduction



On the shapes of an anageg: Top Left: from 1973, a Nasikwabw anageg being loaded off the shores of Wabunun in order to survive the consequences of the 1973 ENSO event. The front and the back of the boat are nearly symmetrical images of one another.

Top right: 1998 (different) Nasikwabw anageg resting at Waviay’s landing just across the lagoon from Wabunun. This shot shows how the two sides of the boat are very different in form.

Bottom: 1974-75, pushing an anageg off Wabunun’s beaches into the ocean. Young men get under the outrigger platform to lift up and push out the boat. Waviay is visible across the lagoon.



From 2006, Diboel working on a replacement kiyad for his Gawan anageg Bwadanak-up. He is sitting under his house, one of his pigs in front of him, two betelnut to his right along with my notepad. The tree is alidad, the usual tree for this part, and he has let it dry for several weeks before doing the trimming shown here.



Bwadanak-up interior hull structure from 2006. The outrigger float is to the left. The kiyad (crossbeams) are tied tightly to the seisu on the right and left, as discussed in Chapter 6. The kiyad goes through the hull to the float on the left. Seisu are made from igsigis or akidus trees and while kiyad are tied to them they are not tied to the gulumoms, ribs, but rather fit through each one.



From 2012, on the model anageg assembling the watot, the stantions which will connect the cross-beams, kiyad, to the outrigger float. The process of placing the watot into the float and tying them to the kiyad is called -lilam, a verb.



Continuing with the 2012 model boat, pounding the watot into place along the outrigger float.



From the 2012 model anageg, continuing with -lilam, here tying the watot. As noted in the text, the distance between the keel and the outrigger float is a critical variable. A best guess is used to start off a boat and each time a new outrigger float must be put on. It is adjusted as used, of course . Dibolel completely changed the settings on his anagag Bwadanakup when he first obtained it.



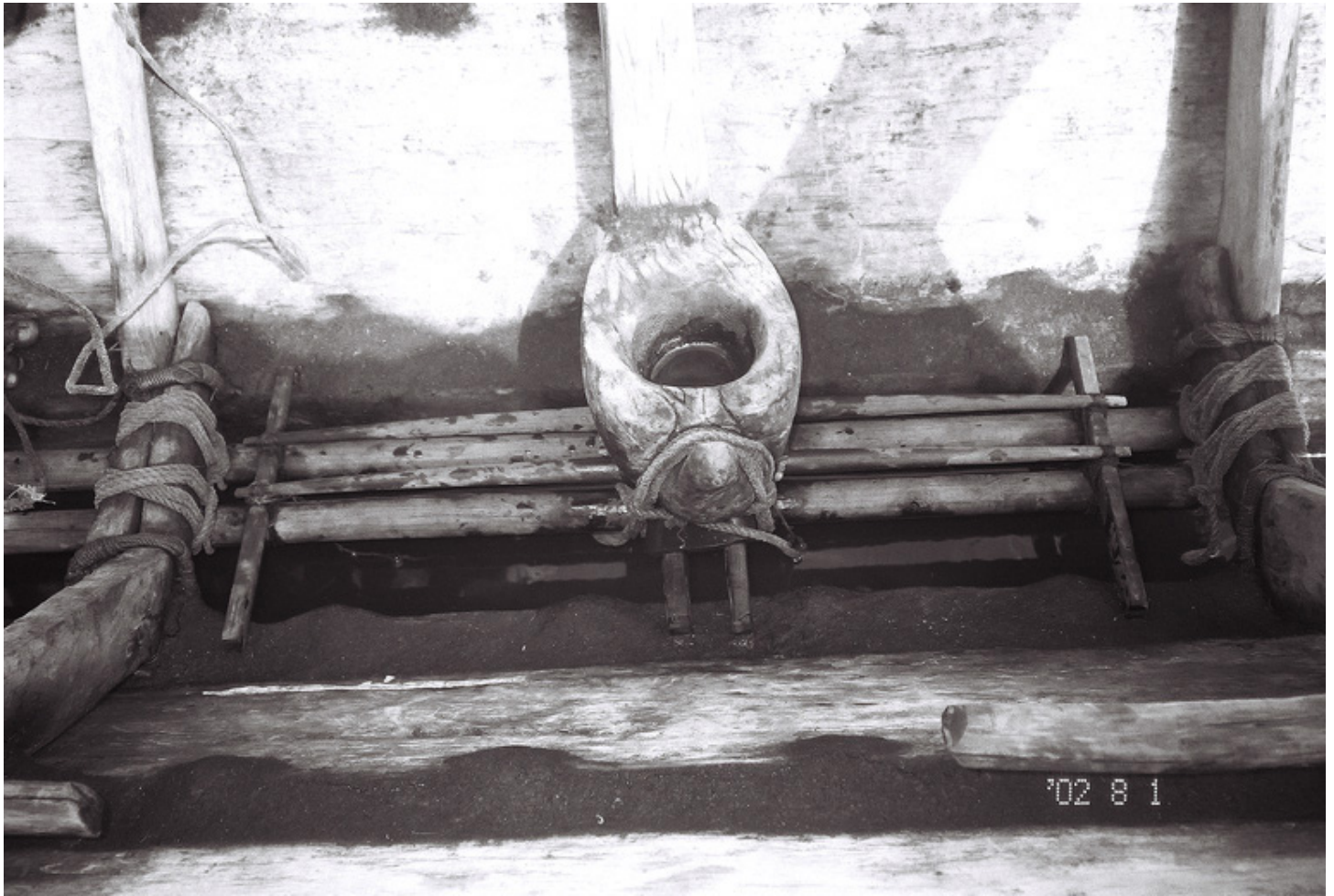
From the 2012 model-building. The kiyad placement on an anageg is the beginning of a complex structure the next steps for which are shown here as this piece is tied onto the kiyad but set out from the strakes. Between the kiyad ties other holes are created for a secondary set of beams that become part of this structure. Only briefly described in the text, the platform structure is likened to the flooring in a house.



Continuing with the outrigger platform structure by tying another of the pamanag between the two center kiyad. The kunusop/duwadul structure for this model has already been made and rests across the kiyad inside the hull. Part of its tying attaches it to the pamanag.



From 1998. This picture was originally taken to show the end of one of the boat's main springs, a piece called nedin. But it does a better job of showing how the boat design deals with some of its motions. Every anageg should have 10 kiyad, cross beams running from the outrigger float—out of sight but to the right here. All but two of the kiyad run from one side to the other side of the boat, tied to its two seisuiy. The fist and tenth seisuiy, however, are lapped to the outrigger-side seisuiy but do not cross to nor are they tied to the opposite seisuiy. This is because the movement of the outrigger float is the most extreme at its two ends; their motions would threaten the integrity of the hull.



From 2002, Lavanay gulumom(rib) reversal. The kunusob, socket joint that holds the sail, is in the center of the boat. There are five kiyad, cross-beams between the bow and the kunusop and five between the kunusop and the prow. Likewise, there are five sets of gulumoms, ribs, behind and in front of the kunusop. However, their relative relation to each other is reversed on other side of the kunusop. Between the bow and the kunusop the walam gulumom is behind the watan kunusop as in the upper right in this picture. Between the kunusop and the prow the walam kunusop leads, is in front of the watan gulumom.

II. Spings and the internal structure of the boat

The Hull: In/Out/In



Left: 1974-75: One of Wabunun's highly regarded kaybwag, a middle-sized outrigger. Compared to an anageg it looks flimsy but it is as carefully designed and executed as an anageg. It is probably close to 10 meters long. Its matsibod closure faces the camera designating the boat's "base." The kunubwara is at the tip. Its right side is lower than the left so that the poles that might be thrust ahead of the boat for poling purposes do not hit it.

Right: 1974-75, another of Wabunun's renowned middle-sized outriggers. With very fast paddling or a good wind this boat would hydroplane, rising so that the outrigger float skims the surface of the ocean or rises completely out of it. Speeds such as that by paddling were necessary, and sometime successful, for chasing turtles. The taller of the several people in this picture is Gumiya, my valuable guide, companion and instructor from 1996; in front of him facing the camera is Abgunin, Wabunun's school master in 2012; behind him is "Lemik," until Aisi remarried Sipum's youngest brother, from after 2000 one of Wabunun's main voices.



TOP: From 2006-07: Repairing the prow/stern structure of Bwadanakup, a Gaw-made anageg. In addition to its external curves, the keel (wag) has groves cut in the top of its two ends so that carved tabuiy can be tightly fit into them. Dabuiiy hold the prow-/sternboard, kunubwara, in place. Visible at the very top of the strakes is the Eyon tau (Throat male), a line that is supposed to be koliu and which helps pull the two sides together. It complements the kunubwara (prow-/sternboard) which will cover the gap between the strakes. Short grooves (atonen) are also cut on either side of the keel into which the bottom strakes are fit, and pulled in towards each other.

CENTER LEFT: Madiu Gisaw trimming the part of the tabuiy that will be wedged into the keel's slot to hold the kunubwara tight. This piece must resist the waves that will pound it...and it is said it will do so until it rots.

CENTER RIGHT: Fitting the tabuiy into its slot atop the end of the keel.

BOTTOM: Provisional placement of tabuiy, on the right, up against the vertical kunubwara. The strakes must fit into grooves on the back of the kunubwara. Together with the grooves on the keel, covered by caulking material in this picture, and the Eyon Tau tie at the top of the set of strakes, this form pulls the strakes in together countering their being pushed out towards the middle of the boat.



2012. From the model anageg the central structure of the keel shows how pairs of gulumom (rib) are tied into place. The holes between the ribs are for tying the bottom strake.



From the 2012 model anageg: trimming a cut-away on the bottom end of the bottom strake which must fit into the groove (atonen) designed for it towards the end of the keel. Hours must be devoted to cutting a log into a strake then more time with an adze so that it is about ready; then even more time for the final stages of fitting.



From 2012 model anageg: This shot shows how the bottom strake fits into its groove (atonen) on the keel, how the strake above it overlaps it, and how both strakes fit into the groove cut in the kunubwara. Holes have been drilled into the bottom strake. Its almost ready to be tied.

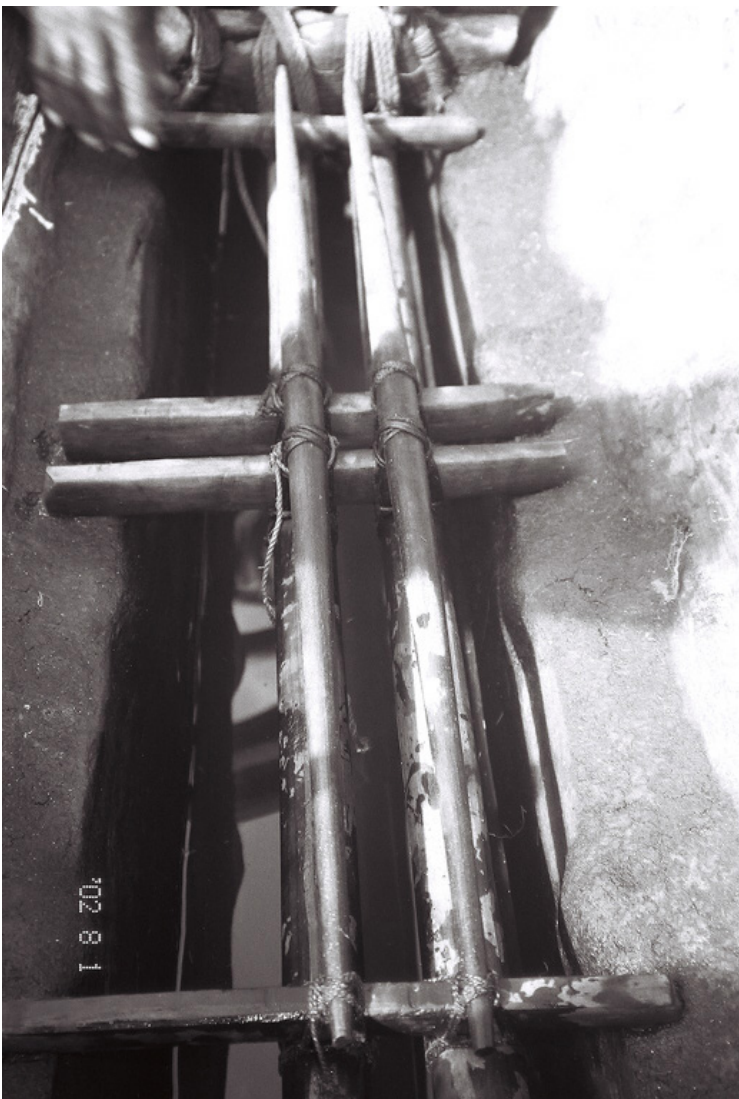
Kaynikw, Down/Up/Down: the heart, or lung and navel.



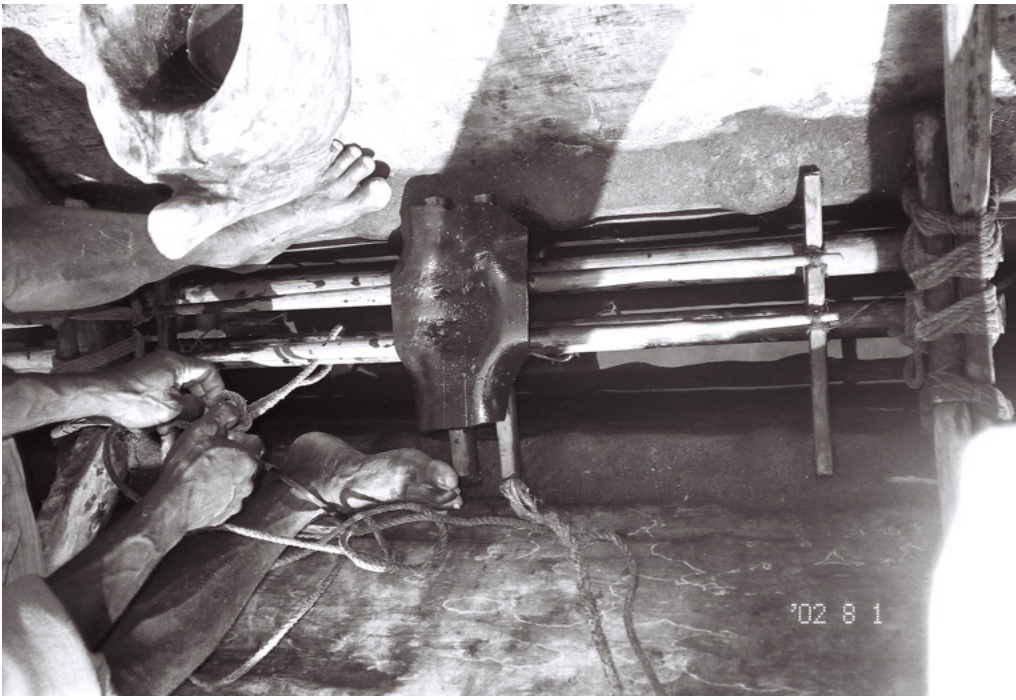
From 2002, Levanay's new *kaynikw* placement. This picture shows how the *eyalyal* are tied to the 6th *gulumom* (rib) set. The *eyalyal* extend in the opposite direction about 5 meters back toward the back ("base") of the boat. The first, left/outrigger float side, *kaynikw* has been set across the *talapal* and its tying has started.



From 2002, Levanay's new kaynikw placement and its asymmetries. This shot shows how the eyalyal are fixed closer to the outrigger side, the left side of the boat looking forward from its base, but the right side of this picture. It also shows how the kaynikw are set over the eyalyal, centered with the outrigger side (right in the picture), off-center and to the left over the slightly larger watan/katan eyalyal.



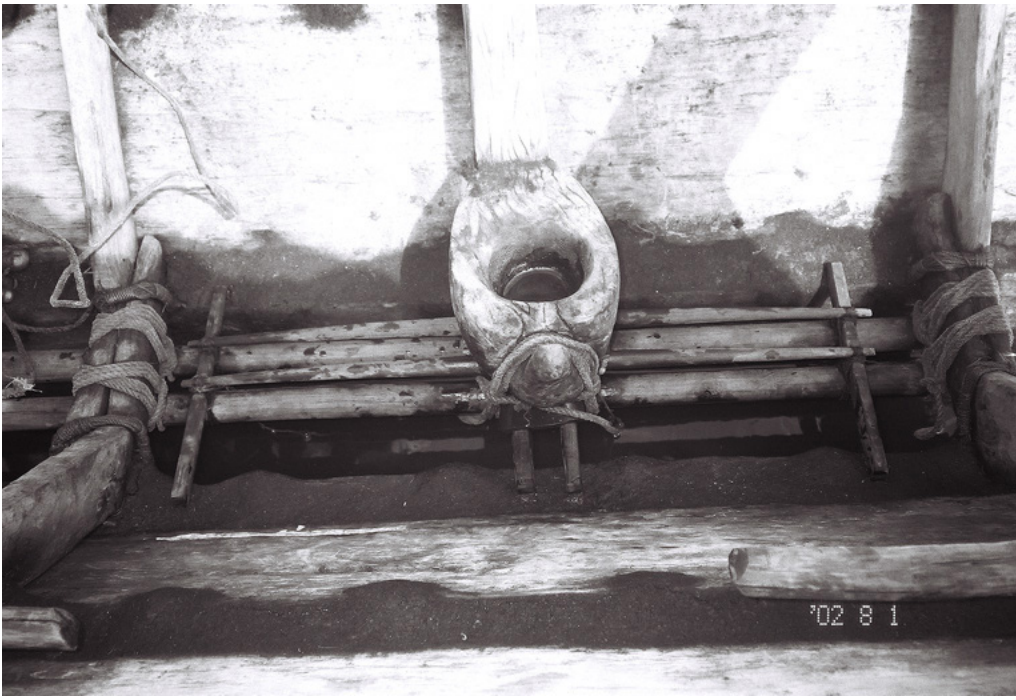
From 2002, Levanay's new kaynikw placement, kaynikw tying. Kaynikw are tied in their middle four positions first, moving from left to right and back ("base") to front ("top/tip"). Then ends are tied, again preserving the order just noted. In this shot the base is tied, Duweyala positions himself to tie the top.



From 2002, Levanay's new kaynikw placement: Once the kaynikw is in place the structure is prepared for the kunusop. In the past a coconut husk was set over the kaynikw. Now a piece of thick rubber is used. In this shot Duweyala is fastening a sipkwadoy knot over the watan/katan eyalyal to begin fastening the kunusop.



From 2002 Levanay's new kunusop placement: The kunusop, the form that will hold the mast, is centered over the kaynikw then tied using the "pig nose" (abunubuluk) carved for that purpose.



From 2002 Levanay's new kunusop placement: Once the kunusop is fixed onto the kaynikw the next step may be started, the tying of the nedin on to the extension of the kunusop, the duwadul. The duwadul rises up in the center of this picture, just opposite the "nose" used to tie down the kunusop. In this image the slight arcing of the kaynikw is visible. The two ends are pulled down, the center pushed up by the doubled means of the talapal height differential and the tapered kaynikw.

The *nedin*: Center fast, the ends float



From 2002, Gideon, from Ole/Koyagaugau on the beach in Wabunun sculpting a new akidus into the proper diameter for a nedin.



From 1998, a Nasikwabw anageg. The nedin(nadin in Nasikwabw) is the piece angling in from the lower right corner tied loosely to the kiyad that only goes about half way into the boat's hull structure.



From 1998, the other end of the Nasikwabw anageg looking at the end of the nedin following its arc over the outrigger platform towards the duwadul, not visible in this picture.



Left: From 2002, Levanay's slight outrigger float arc towards each of the keel's ends. This design feature is, according to Duweyala, supposed to shift weight from the keel/hull to the outrigger. This shot is after the platform has been retied. It can be seen that the platform flooring is tied to the pamanag, but not the kiyad.

Right: Also 2002, but before the outrigger platform has been retied, showing the arcing of Levanay's keel towards the float to the left.



From the 2012 model anageg: Adding to the outrigger platform structure. Just outside the watot, the stantions connecting the kiyad to the outrigger float, a piece is tied running nearly the full length of the float. It is called pilpilitet. Tied to it are beams called pamanag, that run between it and the albeikun, the board tied out from the strakes used to create the mayowag, a coconut frond covered space designed to prevent waves from lapping into the hull area. Eventually a 10-kiyad boat will have 9 pamanag, one between each set of kiyad. The slender trees cut to create the final top of the outrigger platform are tied to these pamanag, and must not be tied to the kiyad. The central pamanag becomes an important part of the nedin structure for an important knot runs between the duwadul and that central pamanag as the nedin tying is completed. In a sense, two structured layers connect the hull to the outrigger float, one by means of the kiyad, the other by means of the kunusop/duwadul structure and the pamanag.



From 1998, Mwalubeya's anageg resting in Koyagaugau, showing the auleybwad tied onto several kiyad (and seisuiy) pressing the duwadul securely into place. Resting over it is one of the boat's two enam, very light prismatic shaped pieces of wood used to support a mast's angle as it is tilted towards the outrigger float`



From the 2012 model anageg construction: Bracing the duwadul with the piece called auleybwad. Tied to kiyad it presses the duwadul into place connecting the two structures that tie the hull and outrigger float(lam) together, the seisuiy-gulumom-kiyad-watot-lam set and the duwadul-tanu-wag-lam set.



Left: From 2002, Duweyala placing first of two slanted tanuwag into outrigger float. This operation is conjoined with the tying of the nedin, which lies between Duweyala's feet. One person said "tanuwag" comes from toniwagan, a Muyuw expression that refers to someone or thing that governs another.

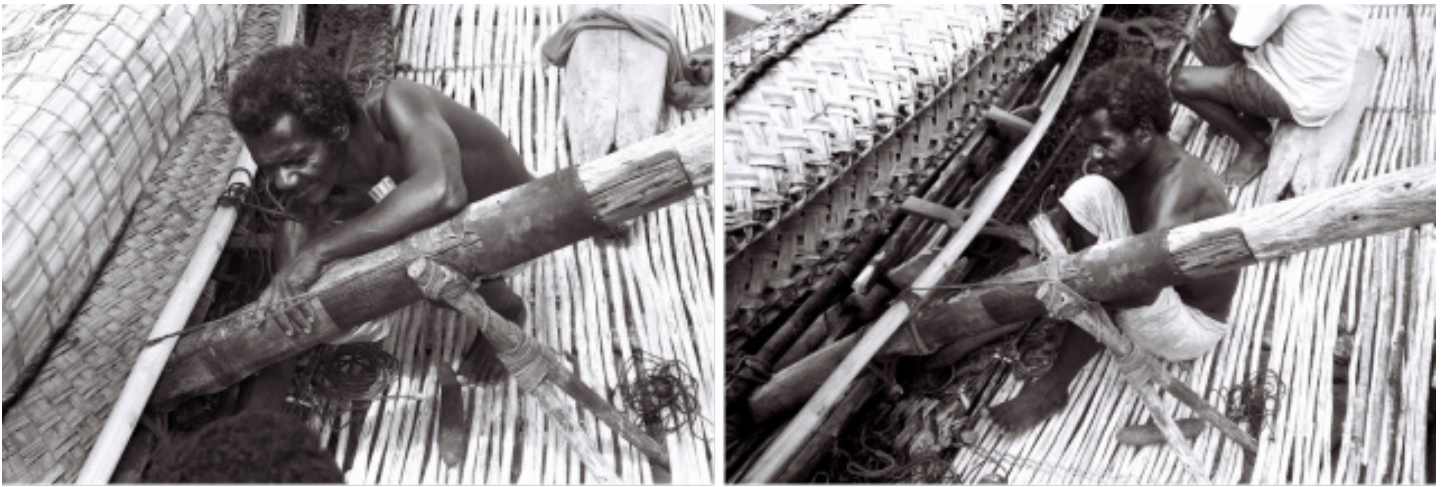
Right: From 2002, with Duweyala beginning the nedin tying, wrapped into the two slanted tanuwag, Gideon pounds the wrapping into place on the two vertical tanuwag. The tying form for both sets of tanuwag is kumis, the same structure used for tying the kiyad to the watot.



Left: 2002, retying Levanay's the nedin: Duweyala above, Gideon beneath the outrigger platform preparing to tie the duwadul to the central pamanag.

Upper right: 2002, retying Levanay's the nedin. Rope—it should be the vine mamal—is passing over the duwadul going beneath the outrigger platform to a pamanag out of sight below.

Lower right: 2002, retying Levanay's the nedin. Gideon looking at the camera underneath the outrigger platform, his hand near the knot that has secured the duwadul to the pamanag.



From 2002, top left Nedin tying. In the center of this picture the slanted tanuwag hold the duwadal and extend down to the right into the outrigger float. The nedin is the white pole to the left with a woven coconut frond and the rolled up sail further to the left. The nedin is placed on the duwadal held loosely in place but, beyond the sights of this picture, arced into each end of the craft. Duweyala readies the line—it should be mamad— that will tie the nedin in place around both the duwadal and up to the tanuwag.

Upper right: From 2002 Nedin tying, 2. The nedin is now tied around the duwadal. Note that the provisional tie holding it in place is no longer there. Beneath the nedin the knot running down to the pamanag is visible. Further down on the duwadal the auleybwad can be seen crossing it and just beyond a gulumom the tie between the auleybwad and an invisible kiyad. Below the tanuwag is one of the stones—“grandparent”— Duweyala was using to pound the lines tight.

Bottom center: From 2002 Nedin tying, 3. Duweyala hammers the rope into place that is connecting the fastening around the nedin to the tanuwag up to the right.



From the 2012 model anageg, the “wag kan” (boat food) tied over the place where the nedin is fastened to the duwadul. Rather than the now usual black rubber strip, a portion of a coconut husk was put over the leaves, the green visible around the edges of the tie.



Upper left: From 2002 Nedin tying: A piece of hard rubber, formerly a coconut husk, is secured over the fastening that first holds down the nedin and wraps it to the tanuwag. This is to protect the fastening from enam, the prismatic structures that will be laid over this part of the boat as one of the devices for adjusting the angle to which the mast leans toward the outrigger platform.

Upper right: From 2002 Nedin tying, Gideon, Duweyala's older brother, handles the wrapping that runs up to the tanuwag.

Lower center: From 2002 Nedin tying,6: Final touches as Gideon completes the nedin connection with final loops around the tanuwag.



2002, retying Lavanay outrigger platform. Top: Asibwad (*Timonius timon*) poles tied to form the top layer of the outrigger platform. Although just tied to the pamanag, beams set between the kiyad, this form nevertheless ties together the two structural forms conjoining the outrigger float to the hull. They are bound by two planks or poles running the length of the platform, the albeikun and the pil-pilitet, the latter shown here. Each of these is tied to both the kiyad and the pamanag. This flooring is put in before the kaynikw and nedin, and tanuwag, are redone. Bottom left: A close-up of the binding process for the outrigger flooring. Asibwad poles are not long enough to reach the length of the platform but two together usually are. So the trees's bases are tied to the ends of the platform, their tops tied together near its center. Bottom right: "Grandparent" stones are used to fasten this flooring, for the most part using a continuous line for each pamanag. The tying material should be mamad. These pieces shown here (bottom right) are being tied around an old tanuwag. It is good that the when these are retied they will have to be fit through these tightly bound asibwad poles.

The Vayiel, Mast: a fixed base, swaying top. And the kavavis, which does not bend.







Left: From 2002: Distant shot of Lavanay's new Nasikwabw mast showing the balau and powan balau. Although people speak as if there is just one balau line, there are usually two said to be in a mother/child relationship, the latter helping the former. 2002R4Mast

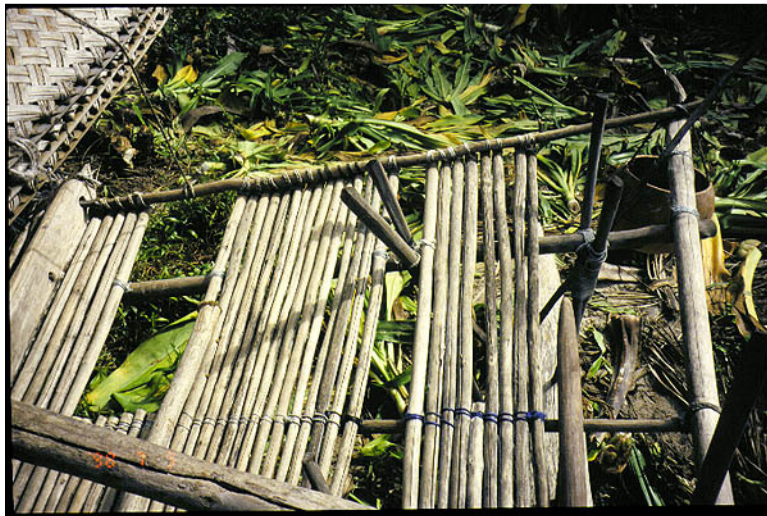
Right: From 2009: A close up of a model mast showing balau and powan balau lines as well as the yawasay, hal-yard, the line used to raise and lower the sail. The kuk, carved rooster, must point away from the outrigger float, the sail on the opposite, outrigger float side of the mast.



From 2002, Lavanay's three kavavis, the two inan "mother" on the left, the natun, "child" on the right.



From 2002, John demonstrating the position for holding the kavavis while seated on above the outrigger float on the trailing edge of Levanay.



Left: From 1998, a Nasikwabw anage showing the gap on the platform designed for the insertion of a kavavis. The kavavis goes up and down against the outrigger float, pressure from the water pushing the piece into the float. The large gap to the very left is a toilet.



Right: The 1998 Nasikwabw anage underway with the kavavis "down" and right next to the float. On this anage there was a groove in the watot inside of which the kavavis would slide and be held.

III. Imagery and the external structure of the boat

The body and the house



From 2009: Three anakan (kiyad equated structures) are evident in this shot, one from the lower right angling to the top, another from the lower middle which intersects with its opposite at the point where the poiyi intersect, and one distant towards the back. The two others are not in this picture. Made from a very light wood (often a swamp tree), these pieces tend to be more rectangular than the round shape found with virtually all other house parts. As noted in the text, the ideal 5 in number is exactly half the number of kiyad that should be found in an anageg. The image of a boat is then completed by the house that should be opposite of this one in the ideal two-rowed village eastern and central Muyuw villages should replicate.

Between the cock and the banded sea snake



Levanay kuk, an image of a rooster, photographed on a house mat in Nasikwabw, 2002. Carved from *Calophyllum Inophyllum*, the tenon of the mortise and tenon structure is on the far right. The hole just to its left is for the halyard, the line by which a sail is raised. The angled discoloration further to the left is from the balau powan, the tie that pulls the structure up towards the mast. The line further up the rooster's neck, called weko, is tied down on the mast for exerting pressure down.



Images of the Kuk, the “rooster” form which sits near the top of the mast. Carved out of Kakam (*Calophyllum Inophyllum*), the form always points to the side opposite the outrigger float, supports the halyard that holds the place of the sail higher or lower on the mast, and provides a mnemonic for the passage of time at night, the time for voyages when navigational issues are most important.



2009, hens and roosters perched at night in the upper reaches of a frangipani tree behind Dibolel's house in Wabunun. Every domestic dwelling whether in a village or alone by itself in the bush has as part of its context two or more chickens. From their perches at night they will call every hour or so until dawn initiating a chorus across the village that people regularly attend. Perched above an anageg on its mast they take the same position, strutting their place in the scheme of things...



Top Left: Close-up front image of the end (sibun) carving (pus) for Bwadanakup's keel (2006-7 photo). Affixed to the keel and behind the seaeagle image is the part called tabuiy/dabuiy. It is modeled after the gracefully rising neck of a heron but contains a plethora of images among them vertically oriented swirls whose head-like forms supposedly depict seaeagles.

Top Right: Close-up side of the end of Bwadanakup's keel (2006-7 photo). These images also show how cowrie shells (yavig) are tied to these forms. They are expected to shatter waves sending up a spray that is likened to smoke. In some shell sequences the position of the shells inverts between one end and another of a series.

Bottom: A 2002 photo of Lavanay showing the different positions of the outrigger float (lam) end, which should model a turtle's head in the water, contrasted to the raised end of the keel which images the high-flying seaeagle.



From 2012, Bwadanakup's stern (left) and prow (right) tabuiy, coded to be female and male respectively.



MAN, literally translatable to “bird,” the removable images lashed to the tops of tabuiy (dabuiy) on the front and back of every anageg keel. Man are always tied on the watan/katan side of the tabuiy, i.e. opposite the outrigger float. The top, more ornately carved man is lashed to a tabuiy on a boat beached on Wabunun’s landing in 1996. When a boat is not prepared to sail these forms are removed and stored inside the boat-owner’s house. The two in the bottom picture are Dibolel’s belonging to his anageg Bwadanakup. The left one is for the boat’s wowun, base or stern end, the position marked by the tail that drops paralleling the shaft used for tying; one person said the appendage was of the bird called mwg, one used for indicating a nearby island. The birds carved at the top of these two were said to be seagulls, but many people say they should be kioki, kingfishers, birds associated movement between islands and from their infacing positions signaling the back-and-forth movement boats facilitate. On both forms the two birds rest on opposite facing images that are said to be the heads of a bird but my informant could not identify what bird. Like most of the other designs, it is “just carving.”



Kunubwara12002R4 010 The Levanay wowun (“base”) stern distant and close-up kunubwara, literally “head-patch.” Although they may not be on the prow kunubwara, people associated this form with a particular snake, one of half a dozen named creatures. The snake is called mwalek (in Central Muyuw) or mwatalalek (in south-eastern Muyuw), probably *Boiga irregularis*. It is associated with the island Yalab, a myth called Mwatitawag, which in turn makes the being the “decider” or “ruler” of outrigger craft, according to some people. Muyuw associated details of the design and story with one of the two main anageg-producing islands, Kweywata. The snake, mwalek/mwatalalek, is considered extremely strong and with its ability to role or curl itself up some people associate it with tying materials, vatul, which keep outriggers together. One person said this snake’s strength was like good tying materials. The pressures associated with the ways by which kunubwara hold strakes together are part of the association between snake imagery and kunubwara.



Top left: From 2009, my first view of the “feared” –my fear– mwatabwalay (banded sea snake, *Laticauda colubrina*), according to the systematic literature a highly venomous, neurotoxic, sea snake, the guyau, “chief,” of the ocean. In addition to humans, who are not supposed to kill them, sharks and other sea creatures defer to them, according to Muyuw lore. In this photo Timo Mayal, a young Wabunun man who quickly left our boat when it landed at Eyon, reappeared with this specimen wrapped about his neck. Although our Muyuw crew knew I wanted to see the animals, I was prepared for them to be frightened of them and beat them to death like they do with other snakes. A kakam tree (*Calophyllum Inophyllum*), whose roots frequently provide shelter for these snakes when on land, stretches behind in the upper third of this photo.

Top right: Up close, the mwatabwalay, the guyau, “chief,” of the ocean. Shortly after this picture was taken Timo laid down on the sand and the snake casually crawled away from him towards a sheltered spot the likes of which it was probably seeking when diverted.

Bottom left: After crawling over Timo, mwatabwalay, the banded sea snake, moves to its goal.

Bottom right: The mwatabwalay with evident bands escaping the sun amidst rocks and roots at the edge of the shoreline trees and sand. These tree roots are not *C. Inophyllum*.



Bwadanakup, 2006, on its perch, pushed, with great effort, above the wave line, protected from the sun...just like mwatabwalay, the banded sea snake, when it struggles to get out of the sun above the usual wave line. Unless they are visiting from elsewhere, all anageg will be protected from the sun like this. Boats protected like this one probably will not be splashed down with seawater every day to prevent them from drying out. But other boats, as was the case with Levanay in 2002, anageg and middle-sized outriggers, are doused every day.

Land and stars



Boagis village from far southwestern Muyuw, the very southern tip of Nayem. Three trees tower over the village, two kaboum and one meikw/kaymatuw. Although meikw may be found almost anywhere on these islands, kaboum is, factually and conceptually, restricted to Muyuw's western and northern shoreline. An umon– deposited sand region behind a beach where breakers rarely reach– tree those that are said to grow on Gawa and Kweywata grow on compressed coral limestone near the water and are not considered as good for the important roles wood from this tree plays in the anageg form. People from Gawa and Kweywata regularly come to Nayem to “ask” for its kaboum for their boat-making purposes. Beyond its use as Boagis's ritual firewood, this tree is part of the isomorphism between the anageg structure and the distribution of trees across the landscape



From 2009, a large vayoun a bit north and west of Kaulay's present location. The tree is large enough to be turned into an outrigger float. A product of Kaulay's fallowing system, this tree's existence is part of the landscape/anageg design structure which defines the eastern side of the Kula as a regional system. Top: Although they emerge as seedlings as soon as a forest is cut, they grow best amidst other flora and are intimately related to the Kaulay-Dikwayas's region ideal oleybikw, middle aged fallow practice.



Left: From 2009, with Tauneduiy, who claims these trees, a clump of vayoun growing east of Kaulay in a region being kept in a digadag, early fallow state. These trees did not appear to be healthy, and a nearby one seemed to be dying—perhaps related to the tree's growing circumstances. Right, also from 2009, a vayoun west of Kaulay on one of the paths heading towards Dikwayas. These trees are not yet large enough to be used and may never achieve the necessary girth for anageg outrigger. But growing along the route to Dikwayas, they inscribe one of the circumstances defining the tree, growing in the mixed area between the dryer ground heading down and north towards the sea, and the wetter ground heading south towards the interior of the islands and its higher forests.



From 2002, a crew member of Levanay, with help from Wabunun women, strips the bark off Asibwad (*Timonius timon*), an early fallow (*digadag*) tree in preparation for retying Levanay's outrigger platform. Originally understood as a matter of convenience, in fact the gardening/fallowing practices of southeastern Muyuw villages, like Wabunun, are organized to be able to produce this tree for this purpose.



Top: In 2002 on Wabunun's beach Levanay crew spread across the outrigger platform to tie down the new asibwad saplings. Asibwad are the top layer of an intricately laminated structure. In this photo it can be seen that the saplings are tied to the pamanag, not the kiyad, the cross beams that connect the hull to the float.

Bottom left: Tying the outrigger platform saplings... They are worked from the ends to the center. Here the men are positioned on either side of the duwadul, the structure that attaches the mastmount to the float. Note that duwadul ties are not yet completed. Although the two stakes attaching the end of the duwadul straight into the float have been temporarily tied together, they, and the other two that angle into the float from half way between the end of the duwadul and where it tucks into the boat, are retied after the platform flooring is completed.

Bottom right: A close-up of the 2002 patapat tying. Here the pieces are approaching the tanuwag, one of the four kaboum-derived stakes that fix the outrigger float's position with respect to the hull. It can also be appreciated that the patapat poles are tied so that their "bases" are at the platform extremities, their "tops" tied together in the platform's center. Typical of much tying on an anageg, these pieces are tied by being pounded into their position with the boat's tabun, the rock that is likened to an elder generation person. Usually of an igneous stone, in theory these stones travel with a boat from its launching to the end of its life.



In 2012, my friend and teacher, Ogis, stands next to the model anageg he made for me as it is about to be launched. Note the white prow and stern sections. Much of that whiteness was from liquefied lime, and it was understood it would soon wash away were this a real boat. But also note the black spots dotting the white background. These are part of an inverted image of the night that these boats are supposed to depict. These craft connect the ground from which their materials come and which they bind by their very travels, to the heavens whose motions establish orientations in both time and space.

Copyright 2017