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CATCHING THE DRIFT: Impacts of Oceanic Drift Material in the Marshall Islands

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The Marshall Islands, situated in the Central Pacific, are far from any major landmass. However, by means of oceanic drift, they are connected with virtually all the Pacific. This paper reviews how the types of drift from various areas have impacted the lives of people on the Marshall Islands. The local language, canoe construction, tools, food, agriculture and other aspects of the culture have been influenced by oceanic drift, with the effects continuing to the present

The Marshall Islands, located from between 160° to 173° east and 4° to 14° north, lie thousands kilometers in all directions from any major mass of land. Geologically the 29 atolls and 5 solitary coral islands¹, which constitute this country, are figured to be quite young, probably only coming to a point where they could be colonized by land species three- to four-thousand years ago. Furthermore, it was likely only about two-thousand years ago when humans were able to colonize the land (NBTRMI 2000, pp. 8, 19).

Although it is very difficult to be completely certain as to what vascular plant species are native, as best as can be figured, only about seventy species arrived without human assistance. As many as 80% of these have fruit, seed, some other part capable of spreading through oceanic drift. A limited number of species, such as ferns and sedges spread via the air currents; “kañal” or great lettuce tree (*Pisonia grandis*) becomes established in new locations by its sticky fruit attaching themselves to the feathers of sea birds. Later on, crops and weeds came

with the help of humans. All other plants likely came by traveling the waves.

The proportion of plant species which likely came through oceanic drift is quite high when compared with other islands. After Krakatau was devastated in 1883, the restoration process began a little over a year later with a “few blades of grass.” Although the nearest unaffected land was comparatively near, being only about 40 km away, early plant recolonization consisted of many species which spread via oceanic drift. Within fifteen years of the cataclysm, 44% of land plants likely came from the sea. One hundred years later, this proportion had shrunk to only 18% (www.geog.ox.ac.uk/research/bie/krakatau/intro).

The flora of Christmas Island in the Indian Ocean, it is estimated that 30 to 40% of native plants would have arrived by sea; figures for the various islands of Polynesia range from 20 to 64% (Clausen 2005; p. 132). Hawaiian vegetation is said to consist of only 14.3% of species capable of regular sea dispersal, with another 8.5% which possibly came “by rare or freak flotation event” (Carlquist 1980, p. 102).

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Terrestrial fauna could also have arrived via oceanic drift, although probably to a much lesser extent. Small reptiles and some insects and other arthropods are known to spread when they—or their eggs—are lodged in the roots or other sufficiently protected sections of floating logs or rafts, be they natural or man-made (Thornton 1996, pp. 101, 103, 104). The fact that there are so few native reptiles, no native amphibians and no native terrestrial mammals in the Marshall Islands would reflect the difficulties and hazards involved in this form of dispersal.²

Once enough vegetation had become established on the atolls of the Marshalls, humans could settle the land. Much information has been written about the extraordinary navigational skills and advanced canoe designs of the early settlers and there is no reason to dispute that much of the arrivals were well-planned and intentional (Carter 1963, p. 18). But accidental arrival by people who were washed ashore after drifting in the currents for various lengths of time has also been documented and continues until today (see below).

LIKELY PLACES OF ORIGIN

After presenting both historical accounts of drift material and his own field work, Spennemann (1997, p. 6) concluded that “material from *all* areas of the Pacific...has arrived in the Marshall Islands.” For some of that material, the origin can be determined, with others, it is little more than educated guesswork.

The major oceanic currents that effect the Marshalls are the westward moving North Equatorial Current and the eastward moving Equatorial Countercurrent, with the southern atolls effected to a degree by the South Equatorial Current. During June through September, the southern portion of the North Equatorial Current shifts a bit more to the north, then back south the opposite months of the year. Sea areas with permanent small eddies are known to exist near the individual atolls (Atkinson 1987, p. 57; Spennemann 1996, pp. 23-25; Taylor 1950, p. 5).

Winds also play their part. Periodic tropical storms become ‘giant egg-beaters’ over the sea, twisting the course of drifting material every

which way, moving things across the normal courses of currents, tradewinds and doldrums. They also can scour the land, jettisoning trees, vessels, buildings and other potential jetsam—including people—into the water. So under those circumstances, objects originating anywhere potentially can cast ashore on any beach (Erdland 1914 [trans. Neuse 1961], p. 18; Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], pp. 34, 55).

But beyond where an object may have originated and then where it made landfall, the route it may have come is often another matter. Not everything necessarily came a direct route, riding one of the major known currents—things could have just as well taken a zig-zagging ‘scenic detour,’ having been carried it hundreds, if not thousands of kilometers out of its way.

From the East and South

Since the major current which flows through the Marshall Islands is the North Equatorial Current, part of the giant northern gyre that encircles the North Pacific in a clockwise direction, it is easy to assume that there would be considerable drift from west coast of the Americas. Driftwood is to be found in abundance along the shore of northern California to Alaska (Alix & Koester 2001).

Kotzebue (1821 [comp. Levesque 2001, p. 240]) describes “wood which is drifted from the east, from distant islands, or from the coast of America.” Chamisso (1821 [comp. Levesque 2001, p. 364]), mentions “the trunks of northern firs.” In the report by Schischmareff, the landing party encountered “large trees which had been drifted there by the sea, and resembled our oaks” (Kotzebue 1821 [comp. Levesque 2001, p. 221]).

Whether on account of these statements or for other reasons which could not be ascertained, more recent researchers have concluded that such drift logs are “flotsam pine logs [which] came from the west coast of North America,” “cut fir logs” from California and that: “Stranded trunks from North America are actually not uncommon on Arno beaches” (Levesque 1992, p 523; Spennemann 1997, pp. 2, 3; Wells 1951, p. 3).

However, the historic accounts are quite sketchy and not sufficiently conclusive to try to use them to pinpoint any particular launching spot. And while some of the early explorers, such as Chamisso, did have quite a bit of botanical knowledge, even he admitted during their sojourn to California that the flora “offers the botanist much that is new. Known American genera associate with those strange to us, and most species are still undescribed” and whatever collections had been made had “yet to be presented to the world” (Chamisso [trans. Kratz 1986, p. 242]).

So considering these tremendous limitations to the knowledge those early explorers would have had—and not had—they could have just as likely compared what they observed to Eurasian species rather than North America. (See further below regarding “kāmeej,” “jelaar” and “aik”).

But drift material does definitely come from the east. When surveying Bokak Atoll, the most northerly in the current Marshall Islands, Thomas *et al.* (1989, p. 33) discovered the remains of a 5 meter skiff that had gone missing off of Maui in February 1979.

Canoes and people from Kiribati were—and continue to be—regular occurrences, especially to the southern atolls such as Mili and Ebon (Erdland 1914 [trans. Neuse 1961], pp. 14, 18). A most recent drifting in the region occurred when the engine failed on a couple’s small craft in Kiribati. They ended up spending over the next month at sea, eventually being rescued near Kapingamarangi (Mar. Is. Journ. 2006, p. 4).

And certain small driftseeds, such as the rare Mary’s bean (*Merremia discoidesperma*) and prickly palms (*Acrocomia* spp.) are known to only grow in Central America and have been found on a few instances in the Marshalls (Gunn & Dennis 1999, pp. 94, 172; Vander Velde & Vander Velde 2004, pp. 7-8; Vander Velde & Vander Velde in press).

From the West

Drift material to the Marshalls from the Papua New Guinea, Indonesia and Philippine region of the Pacific has actually proved to be easier to document. Probably the majority of this

comes via the Equatorial Counter Current, a narrow band of water of relatively swift water. Likely, the recent saltwater crocodile (*Crocodylus porosus*) came this mid-Pacific express freeway. It would be harder to say, though, whether a piece of obsidian and pumice found on Nadikdik which originated in the Bismarck Archipelago of Papua traveled this route or went the entire gyre of the Southern Equatorial Current for at least part of its route (Spennemann 1996, 1997).

Early on, the naturalist Chamisso recorded species of drift seeds/fruit during his visit to the Marshalls that he felt came from the west. These included “fruits of pandanus species, which are only met with in the larger countries lying to the west [= *Nypa fruticans*]...the *Aleurites triloba* [*Aleurites moluccana* or candlenut], and other trees belonging to the general Flora of Polynesia, and which we afterwards saw in the west...” (Chamisso [trans. Kratz 1986, p. 242; Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 289).

These two particular species continue to be found regularly in the material which drifts ashore in the Marshalls. We have found them on all the beaches of all the atolls we have been able to examine. *Nypa* often arrives in a viable state and we and other persons have sprouted some of these. Candlenut is always quite dead and putrid smelling.

Other small seeds clearly indicate a western origin. We have found numerous non-viable tropical acorns from the genus *Lithocarpus*, which would have come from Papua New Guinea, Indonesia, the Philippines or possibly even Asia (pers. comm. C. Connor). The little-known tree genus *Gigasiphon* ranges from Indonesia to Africa; we have collected dozens of these attractive seeds, several of which were viable and are still surviving on Majuro.

A very battered specimen of the umbilicate nautilus (*Nautilus scrobiculatus*) was found in 2005 on Majuro. Living animals occur only around New Guinea and the Solomons (Abbott & Dance 1997, p. 377), and are easily distinguished from the more common species, the chambered nautilus (*Nautilus pompilius*). While the latter is what is normally thought of as “lo-jiljiln jourur” (or just “jourur”) in Marshallese

(Abo *et al.* 1976, p. 105), both would undoubtedly be called by that name.

Many of the records of human drift arrivals have also come from the west (Spennemann 1997, p. 4). Because of their frequency, Erdland reasoned that the mythical land of Ep must be the literal Yap in the Carolines. On account of this as well, he also felt that “population of the Marshall Islands stems from the Carolines” (1914 [trans. Neuse 1961], p. 11).

IMPACT ON PEOPLE

With so much oceanic drift from just about anywhere and everywhere across the Pacific arriving on the extensive beaches of atolls which otherwise have limited ecosystems and little variety of plants, it is expected that this material would long be of interest people living in the Marshalls. Far beyond just a subject of importance to biogeographers and others studying currents and dispersal, drift has had impact on the lives of people. In other parts of the world, oceanic drift has been known to effect the culture for centuries, ranging from fanciful legends as to origins to supposedly changing the course of history.³ In the Marshall Islands, drift can be said to have effected the life—and death—of the people.

Language⁴

Vernacular names in themselves can offer hints as the general knowledge of people of a certain subject. There are a number of terms in Marshallese used to describe various drift objects.

“Jokwā” and its variations of “addijokwā” and “kājokwā” in some applications may refer driftwood in general. Abo *et al.* (1976, p. 114) explain it as small driftwood, while Carucci (1997a, p. 128) defines it as driftwood at sea. But many other people use these terms to when speaking of hard, jetsam of the high water mark.

When something drifts away, it is said to “pelok,” if it drifts ashore, it is “petok” or “eotok.” Over twenty additional terms for drift material were identified (see Table 1; for discussion of some of the individual objects, see below). Most of these are well-established traditional terms, but a couple of them are more modern colloquialisms. Some are regional

names, such as the Enewetak name “lait” for Portuguese-man-of-war which in other areas is “aolōk.” So far, no match has been made for “luomuuj,” which was defined by Kramer & Nevermann 1938 ([trans. Brant & Armstrong 1942] p. 292) as “driftwood species” nor “kānōno” which was said to be ‘soft, useless driftwood’ (Erdland 1914, p. 152).

Furthermore, many of these terms have also been incorporated into place names on various atolls (see Table 2).

As mentioned elsewhere in this discussion, people would periodically get off course and end up somewhere other than where they were intending to go. Sometimes these people were welcomed and could stay; at other times, they were not (see below). The term “pejpetok” literally means a discarded pandanus key, often one that drifted and then washed ashore—something totally worthless. Outsiders to this day are sometimes called “pejpetok” especially when being spoken against. This is a derogatory term for a foreigner (Carucci 1997a, p. 146; Kelin 2003, p. 157).

Drift logs, Driftwood and Canoes

One of the earliest accounts of drift material in the Marshall Islands was given by Antonio Galvão, the Portuguese governor of the Moluccas. Among other voyages, he recounted the travels of the Spanish vessel Florida, captained by Alvaro de Saavedra in 1527 during a visit to “Los Jardines,” which was likely either Ujelang, Enewetak or Bikini (Hezel 1983, p. 16; Levesque 1992, p. 523). In his 1563 work, Galvão told of canoes, “Paroas, que faziam de madiera de pinho, que ail venha ter em certo tempo, sem saber dondo...” (comp. Levesque 1992, p. 520), or as was translated a few years later by Hakluyt (1601 [comp. Levesque 1992, p. 524) “...a kinde of boate called a parao, which they make of pine wood, which is driven thither at certain times of the yeere, they know not how, nor from whence.”

When Kotzebue reports on drifted wood, he also comments that the use in canoes was something the people were “obliged to content themselves with” (1821 [comp. Levesque 2001, p. 240]).

Table 1— Marshallese Names for Oceanic Drift Material

Marshallese	identity (if known)	range of possible origin
aik	scented driftwood; sandalwood?, cedar?	Pacific Islands, Malesia, Asia, Pacific North-west?
ajet	<i>Atuna racemosa</i>	Borneo and Philippines, to Tonga, Samoa, Fiji, Micronesian high islands,
aoļok	Portuguese-man-of-war	open ocean
bae (Ratak)	bamboo	Old World tropics
bok-allōñlōñ	sea sawdust?	tropical oceans?
bok-in-Ep	caked mud	rafted in tree roots
buiabui	sago palm?	Malesia, Southeast Asia
deka-lal	basalt rock	volcanic islands, rafted in tree roots
dile	goose barnacle	open ocean, attached to other drift
ejor	hot bean	both Old and New World tropics
eloñwa	goose barnacle	open ocean, attached to other drift
er	cuttlebone	tropical Indo-Pacific
ijur	aromatic resin; spermaceti?	Malesia; sperm whales?
jelaar	driftwood—light colored	Malesia, Asia, Pacific Northwest?
jourur	chambered nautilus	Philippines, Palau, also deep waters of the Indo-Pacific
	umbiculate nautilus	Solomon Islands, New Guinea
kāmeej	driftwood—dark colored	Malesia, Asia, Pacific Northwest?
kāñōno?	driftwood—soft	uncertain
ken iit (modern)	hot bean	both Old World and New World tropics
ken kabwil (modern)	hot bean	both Old World and New World tropics
koba (Rālik)	bamboo	Old World tropics
kūbwe in raj	amberggris?	sperm whales?
kūor	‘bitumen’; amberggris?	Malesia?; sperm whales?
lait (Enewetak)	Portuguese-man-of-war	open ocean
lojilñin jourur	nautilus	Philippines, Palau, also deep waters of the Indo-Pacific
luomuuj?	driftwood	uncertain
tilaan	pumice	worldwide, volcanoes
wūj (wōj)	lightweight driftwood; family Apo-cyaceae	tropical floodplains?

Such would imply that such logs were used simply because no other suitable wood was to be found. However, the opposite seems to be the case. Drift logs are often highly prized in the manufacture of canoes. They are often larger and hence provide greater amounts of wood than what could be obtained locally. Breadfruit, a typical alternative can have high value as a food crop making driftwood a far more practical use of resources (Kiste 1968, p. 75).

The Marshallese word “kāmeej” has nowadays been translated “redwood” (Abo *et al.* 1976, p. 138), but other places render it “pine,” and Erdland (1914 [trans. Neuse 1961], 265 footnote) has it as “spruce.” Actually, the

German term Erdland uses, “pechtanne,” is the name for Norway spruce (*P. abies*) (<http://www.uochb.cas.cz/~natur/cerambyx/1.p.htm>)

But coastal redwood (*Sequoia sempervirens*), is a distinct wood and there is no reason to feel that at least some of the “kāmeej” is this species. “Kāmeej” is said to be dark colored wood and supposedly was used in the construction of canoes. It is said to be resistant to termites and other wood borers, making it particularly valuable (Erdland 1914 [trans. Neuse 1961], p. 152).

“Jelaar” is often translated as pine driftwood⁵ (Abo *et al.* 1976, p. 95). It was also used

in canoe building, being light colored and workable, but not regarded as highly as “kāmeej.” It could potentially include trees from many species, originating in all directions. For instance, one species from the West, erima (*Octomeles sumatrana*), is used in its native range for long dug-out canoes (Croft 1978, pp. 117-119). A canoe fitting the description of one from Papua New Guinea recently drifted ashore on Majuro [pers. comm. J. Pagolu].

Table 2—Drift Material Place Names

WŪJ (WŌJ)

Arōn-wōj (lagoon beach of “wūj”)—Kwajalein tract
 Lo-wūj (amid “wūj”)—Namdrik household; Ailinglaplap tract
 Lo-wūj-kan (amid those “wūj”) Arno tract
 Lukwōn-wōj (in the middle of “wūj”)—Majuro tract
 Na-wōj (shoal of “wūj”)—Maloelap islet
 Wūj-kan (those “wūj”)—Mili tract

KĀMEEJ

Batin-kāmeej (hill of “kāmeej”)—Jaluit tract
 Bokwan-kāmeej (sandspit of “kāmeej”)—Rongerik islet
 Mōn-kāmeej (house of “kāmeej”)—Ailinglaplap tract
 Naan-kāmeej (shoal of “kāmeej”)—Jaluit islet
 Wūntōn-kāmeej (cluster of “kāmeej”)—Lae tract

JELAAR

Āne-jelaar (island of “jelaar”)—Ailuk islet

TILAAN

Mwi-tilaan (house of pumice)—Maloelap tract

AOLŌK

Bokwan-aolōk (sandspit of Portuguese-man-of-war)—Ailinglaplap tract

Another potential impact drift had on canoes that can be speculated was the inadvertent trade and exchange when drift canoes from elsewhere came ashore—either manned or as derelicts. Drift canoes that have arrived here, when in good shape, have been known to be used ‘as is’ as would have been done in the when Marshallese canoes came ashore elsewhere. Perhaps such wayward drift canoes could have served as potential design innovations where they were found (pers. comm. D. Alessio; Spennemann 1996, p. 50-54).

But even small drift logs or other driftwood too small or otherwise unsuitable for canoes has value in other construction and wood-working. A notably long, narrow log that washed onto the beach of Delap recently was used as posts for a cookhouse. And driftwood of all sorts was—and still is—a valuable source of firewood. (The Papuan-style canoe mentioned above that washed ashore in late 2005 in Rita, although parts did serve for a while as slides for children, eventually all ended up in the fire pit.)

Often drift logs, as well as other drift material, come ashore with short-stalked goose barnacles (*Lepas anseriform* and related species) attached, a good indicator of their having been some time at sea (Coleman 1991, p. 86). Called “eloñwa” in Marshallese (although the term “dile” which more accurately describes shipworms, is often also used), these crustaceans are said to have served as the artistic basis of one of the more popular tattoo designs (Erdland 1914 [trans. Neuse 1961], p. 20; Spennemann 1992, p. 39).

Abo *et al.* (1976, p. 283, 286) define the ultra-light wood “wūj” (according to kajin Rālik, or “wōj” in kajin Ratak), as “balsa driftwood” and anecdotal accounts have said it comes from South America. But despite its relative abundance, its place of origin remains a mystery at this time. Specimens sent for analysis have shown it to be a member of the dogbane family, Apocynaceae. So far, its “wood anatomical patterns” are most consistent with buoywood or palo de boya, (*Molongum laxum*), a tree found in the Venezuelan flood plains. Since this source seems rather unlikely, especially in view of the volume of wood that arrives in good condition, a more reasonable origin is still being sought (pers. comm. A. Wiedenhoeff).

“Wūj” was utilized extensively in the Marshalls in former times. It was made into plugs, being used, for example, to stop up the openings of coconut shell containers (“bōkā”) as well as the orifices of prepared corpses (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], pp. 206, 252; pers. communication W. Mwekto). Its natural low density also made an ideal material for the hulls

and outriggers of “riwut ko” or model canoes (Erdland 1914, p. 127; Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 214) and today it will sometimes be used in handi-crafts.

Larger pieces of “wūj” were soft enough for pillows on which to rest one’s head. They were also practical surfaces upon which to roll coconut husk fibers into “eokkwal” or sennit, as an alternative to a rope-maker’s thigh (Erdland 1914 p. 33; Kramer & Nevermann 1938 p. 293; pers. comm. M. Peter).

Nowadays, though, styrofoam has nigh-on usurped the word “wūj” in the vocabulary of many people.

People from Elsewhere

When people are involved, they often can tell where they are from and often how they arrived, which can help in establishing their place of origin. That is, if they arrived alive and were allowed to subsequently survive in their land-fall.

Probably the most famous account of drifting to the Marshalls was that of Kadu, the Woleian which befriended Kotzebue and crew of the Rurik (Chamisso [trans. Kratz 1986, pp. 263-274]; Kramer & Nevermann 1938, p. 86). But other people from that area were known to arrive on various areas to the west (Spennemann 2005, p. 43).

As mentioned above, persons drifting in from Kiribati was a fairly regular occurrence. One “weto” on Ebon is named “Lōkōba,” supposed after a Kiribatese man who drifted in and resided there (Abo *et al.* 1976, p. 552). Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], pp. 199, 203) state that men from Kiribati were not only tolerated but also welcomed as they had a reputation for being strong, fierce warriors. Today the “jowi” or matrilineal line “Ri-Pit” is said to descendents of people who drifted in from the Kiribati⁶ (Tobin 2002, p. 134).

Details are sketchy, but Erdland (1914 [trans. Neuse 1961], p. 12) tells of “four Japanese fishermen were cast ashore on Ujae.” Sometime before that, a Japanese vessel described as a “junk” went off course and ended

up on Lae. (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 12)

Such a fate was all too typical of cast-aways—often persons who drifted ashore from other areas were killed upon arrival or soon thereafter (Erdland 1914 [trans. Neuse 1961, p. 199]).

A rather intriguing account of people drifting within the Marshalls’ atolls appears several times in Kramer & Nevermann (1938, pp.32, 33, 47). They speak of what was called in Marshallese a “tōptōp” or in German, “kiste” and can be translated into English as a chest, crate, trunk or box. It was described as “two hollowed out tree trunks tied together with cord.” This “tōptōp” supposedly originated in Namdrik, drifted to Kili, eventually ending up on Ebon. Upon opening it was discovered that many people had been inside. Most died of hunger, but only one, a man named ‘Leke-mukij’ (spelling uncertain) survived, going on to marry and evidently lived out his days there.

Tools and Trade

If a ship built with spikes, nails, and iron bands is lost at sea, and even if just pieces of such a vessel washes ashore, its metal parts can provide tools that would otherwise be unattainable on coral atolls. An account of Alvaro de Mendaña 1568 visit to Namu Atoll told of “their strangest discovery” being “a chisel, made of an iron nail, from which they concluded a ship from the Philippines had either visited the island or had been wrecked there...” (Anonymous 1876 [comp. Levesque 1992, p. 412]).

While this is possible, it is more likely that this nail-chisel was similar to that described over two centuries later by the crew the *Rurik*. Choris (1822 [trans. Mason 1960, comp. Levesque 2001, p. 443]) commented that when they “asked [the islanders] how they procured [iron], they answered that the sea often cast iron upon the shore fixed to pieces of driftwood.” He later encountered “a block of wood which appeared to belong to a ship [and] still retained some iron, and the waves had thrown it on shore.”

Other non-coralline material from drift proved useful to the early Marshallese. “Tilaan”

or pumice from volcanic eruptions floats well at sea but it tougher than coral rock, making it valuable as a hard abrasive (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 145).

Even non-organic objects that on their own sink “like rocks” (because they are rocks) can float into the Marshalls when they have become embedded in the root system of trees. Chamisso (1821 [comp. Levesque 2001, p. 364]), tells of “hard stones fit for whetting” being “sought in the roots and hollows of the trees which the sea throws up.” Years later, in the roots of one presumed redwood that was examined on Arno in 1950, “several sizable chunks of a tough quartzitic grey-green sandstone” were found (Wells 1951, p. 3).

Many of these root-transported hard rocks were basaltic stones, possibly from as close as Kosrae and Pohnpei and were called “deka-lal” or “earth rocks”. Erdland (1914 [trans. Neuse 1961], p. 93), noted that the Marshallese sling was not a particularly dangerous weapon since the coral rocks available for use did not have much strength. However, if a “deka-lal” was used instead, all of a sudden they became formidable instruments of battle.

No wonder that any of such hard rocks, and any drift metal, was to be delivered to the “irooj,” under punishment of death! (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 145).

Bamboo is known by either “bai” or “koba” depending on the dialect (Abo *et al.* 1976, pp. 27, 151). Chamisso (1821 [comp. Levesque 2001, p. 364]), mentioned that it was among the objects ‘thrown up by the sea.’ Uncut pieces of what seems to be various species of this grass family as well as cut sections are not infrequently found washed ashore. Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], pp. 153, 158, 199) describe the use of drift bamboo in the manufacture of small boxes for storing needles, tinder and other little objects, while less often, longer pieces being uncommonly used for the shafts of spears. Long, thin pieces would have been useful as fishing poles. In more recent times, bamboo rafts have floated ashore, at least one of which is still in use as fencing.

Inside the squid-like cuttlefish (*Sepia* spp.) is formed what is called a cuttlebone or “er” in Marshallese. In many parts of the world, this is given to caged parakeets. Traditionally in the Marshalls, though, “er” was used as a shuttle for weaving pandanus thatch, a tool called “raj” (a term which also means whale).

Newly coined words known by younger people are “ken iit” or “thing of heat” or ‘heating tool’ and “ken kabwil” or “thing to make hot”—modern colloquialisms for large, smooth *Entada* drift seeds which more traditionally was called “ejoj.” When rubbed rapidly, their smooth surface gets hot, and then are mischievously pressed against a companion’s flesh, causing a painful although not serious burning sensation.

“Bok-in-Ep” (or ‘sand-of-Ep’) appears to mud that is caked in the roots of drift logs and other objects. It is rare and is highly prized for use in local medicine (pers. comm. A. deBrum). Analysis would prove interesting as to origin, although of course there could be multiple sources.

For many years, glass balls were manufactured as fishing floats. Now plastic has replaced them, but from time to time, the old glass ones still wash ashore in good condition. These have become popular as decorations in some circles, and are also valuable commodities of trade. Even the less charming plastic fishing floats are used to decorate porches, often with openings cut in them so as to plant flowers. (On outer islands, children will carve make-shift baseballs from bright yellow foam fishing floats.)

Fragrance

“Aik” driftwood is known for its pleasant fragrance. The knots in particular are said to provide the highest degree of scent when scraped and added to coconut oil.

The word “aik” is often used for cedar because of its characteristic highly fragrant wood (Abo *et al.* 1976, p. 6, Jeje ko Rekojarjar [old translation] 1 Kings chap. 67). However, Erdland (1914 p. 276) and Kramer & Neverman (1938, p. 89) give the German definitions for “aik” as “Kampfer” or “Sandelhotz” (or in English “camphor” or “sandalwood”)—not “Zeder,” “cedar.”

People nowadays remark about how rare “aik” has become, which could lend credence to the idea that it was sandalwood. While the Hawaiian sandalwood industry experienced a crash by 1840, about another two-dozen species of this aromatic wood of the genus *Santalum* are known to range from Indomalaysia to Australia. Some of these are harvested commercially, although not to the extent than in times past (Mabberly 1998, p. 637).

However, the only contemporary persons who actually put a description to the scent of “aik” said it smelled like pencil shavings—a large proportion of which are made of incense cedar (*Libocedrus decurrens*)! (Schery 1972, p. 82).

But regardless of its origin (of which there could very easily be several), it was prized for its aroma and was often used to perfume women’s clothing mats and head garlands (Erdland 1914 [trans. Neuse 1961], p. 27, 29, 30; Kramer & Nevermann [trans. Brant & Armstrong 1942], pp. 89, 156).

“Ajet” (*Atuna racemosa* = *Parinari laurina*) is also renowned for its value in making perfume (Abo *et al.* 1976 p. 8). Just about everyone who knows “ajet” knows that it does not grow on these atolls. The tree that produces these large, corky fruit ranges from Borneo and the Philippines, through much of Micronesia, and also into Tonga, Samoa and Fiji (Fosberg *et al.* 1979, p. 89; Smith 1999, p. 29). And while it is interesting that the Marshallese name is linguistically identical with the Kosraean, “aset” (Falanruw *et al.* 1990, p. 22), its wide range means that the fruit that commonly wash ashore on Marshalls= beaches potentially could come from most of the Pacific.⁸

One—or both—of the above been the “aromatic sawdust” could have been the substance to which ‘coconut oil, bitumen and flowers’ were added to make a perfume used for the puberty rites of the daughters of the chiefs (Erdland 1914 [trans. Neuse 1961] p. 134; Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 89)

Erdland (1914, p. 276) and Kramer & Nevermann (1938, p. 292), also speaks of “wohllriechendes Harz” and “Erdhardz” using the Marshallese names “ijur” and “kūor”—however again definite identification is hard to

ascertain. Neuse translated “ijur” as “aromatic tree resin” and “kūor” as “bitumen”, while Brant & Armstrong render these words as “aromatic resin” and “very aromatic earth resin.”

There are several ‘aromatic tree resins’ that are found in areas where drift to the Marshalls is known to originate. There is a type of copal resin that occurs in the East Indies and Malaysia. Damar resins come from a number of tree species in Malaysia, and elemi resins are formed by species of *Canarium* trees known from the Philippines, Mauritius to the East Indies. (*Canarium* drift fruit occur fairly commonly on Majuro beaches.) Any and all of these might have been “ijur.”

And/or it might have included the non-botanically derived, but quite fragrant, spermaceti “the white, waxy substance from the oil in the head of the sperm whale” (Charton *et al.* 1988, p. 271).

There would be reason to conclude this way since “kūor” does seem to fall within what one would expect of ambergris. Also produced by the sperm whale, it is said to be extremely fragrant, and only a small amount yielding a great amount of scent. When fresh, it is often brownish in color, but when it ages, it becomes blackish—like bitumen? And it is known to drift ashore, as “kūor” was said to have done, again something that it was imperative to hand over to the “irooj” if found. Just a small amount was added to coconut oil to make a sweet-smelling ointment⁹ (Carwardine *et al.* 1998, p. 37; Charton *et al.* 1988, p. 8; Erdland 1914 [trans. Neuse 1961] p. 30, 276; Mawer 1999, pp. 24-25).

Recent informants, who were unfamiliar with the word “kūor” gave descriptions of a substance which floated ashore and would possibly better fit that of ambergris. They knew it as “kūbwe-in-raj” (or whale feces or waste), was said to be gray in color and highly fragrant. While never common, they said it has become extremely rare these days, which would correspond with the decline in the sperm whale population.

What sort of odor would have been conveyed to mats after they were rubbed by ‘small birds that washed ashore’ is hard to imagine.

Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 89) in their account call this bird an “annañ. According to Abo *et al.* (1979, p. 16), “annañ,” is a “shadow” or any sort of representation of something else, but also, as a separate entry “a bird, small, about the size of a butterfly, lives in rocks around the shores of the Northwest Marshalls, smells sweet.” The early accounts do explain that the bird “annañ” became extinct about 1880, probably because it was hunted to the brink by introduction of cats. Possibly this could be a sketchy recounting of the extirpation of the white-browed rail (*Porzana cinereus*), a shy, secretive bird which was recorded only once from the Marshalls but is known in other areas in Micronesia (Engbring 1988, p. 34; Pratt *et al.* 1987, p. 126). Nevertheless, even if this bird species was the “annañ”, it does not explain why it was described as being “washed ashore”—or what type of residue from dead birds was desired to have exuding from mats.

Sea Markers and Fishing

When the convergence of currents and other conditions are right, drift material will accumulate at sea in a fairly predictable manner. Modern seafarers speak of “open ocean drift lines” where, unfortunately, waste flotsam tends to be to be found (www.pacificwhale.org).

Traditional Marshallese seafarers were also aware of drift’s propensity to gather in certain areas. Many “kakŀllal ko” or navigational markers which indicate the way-points or proximity to a certain atoll or island are based on where particular types of drift material typically converge. As Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 220) explained “drifting objects are taken into consideration as signs of the nearness and locations of land.” These objects supposedly would “stay a certain distance from the atoll and always on a certain side of the atoll” (Erdland 1914 [trans. Neuse 1961], p. 346).

As some examples:

- Lōkdonornor, off of Bikini, was a hollow tree trunk which had numerous old pandanus sections around it (Erdland 1914 [trans. Neuse 1961], p. 347).
- Along the east of Ebon there was the marine manifestation of Lebokjeb, half of one end of a palm frond (Erdland 1914 [trans. Neuse 1961], p. 362).
- Other coconut fronds were markers of Kwajalein and Wotje (Carucci 1992a, p. 76; Abo *et al.* 1976, p. 263).
- Lipātwa at sea was said to be an upright tree trunk near Namu; Kineen was another tree trunk, but this one of the lagoonside of Ujae supposedly had a branch stuck to the sand (Erdland 1914 [trans. Neuse 1961, p. 359, 355).

Although not an actual sea marker, a legend was told of a wife who was abducted. While being taken at sea, she chewed pandanus, discarding the old keys or sections. The fragrance that emitted from those keys was such that her rescuers were able to follow her trail and find her (Erdland 1914 [trans. Neuse 1961], p. 271).

Drift logs have long been known to serve as fish aggregators and local fishermen know that driftlogs at sea are a good place to find fish (Carucci 1992a, p. 124).

A periodic drift event is the arrival of “aolōko” or Portuguese-men-of-war (*Physalia physalis*). These colonial siphonophores spend their entire existence on the high-seas where their high powered tentacles prey on unwary fish, although they in turn are preyed upon by hawksbill turtles and specialized snails (Vander Velde 1999, p. 3-4). However, under certain wind conditions, these powerful stingers will come ashore, to the woe of any person who gets entangled by the long blue strings trailing below their bubble-like floats. Any fishing that requires the fisherman to enter areas where these cnidarians are in is not too practical.

Food

Many who study oceanic drift toss about the question as to whether or not “ni” or coconut palm (*Cocos nucifera*) is native to a certain area or was introduced through human activity. Usually the factors that are considered are how long it can remain viable at sea, the speed of currents, distances between land, rainfall, etc. (Gunn & Dennis 1971). In whatever case, there is little argument that once “ni” is established in an area, trees leaning over a beach can and

will drop their fruit which will survive some time in the salt water.

The beaches of the Marshalls where coconut trees have long been planted for copra production, as well as other utilitarian purposes, are often littered with nuts. It is easy to assume that most of these are of local origin and likely this is correct. However, some fruit does arrive with evidence of having been at sea—goose barnacles, bryozoa and/or other encrustation. While many of these nuts are clearly dead and useful for only firewood, not infrequently, they are alive and could grow. These “coconuts that drift to that land” have long been used for food and are often gathered for such even today (Carucci 1997a, pp. 122; 386; Kelin 2003, p. 157)

Another tree which is said to have been brought to the Marshalls by people is “kotŋ” or tropical almond (*Terminalia catappa*). The tree grows relatively well in the atoll environment and produces edible seeds and is still promoted as a food crop. In our searching of the beaches, “kotŋ” driftseeds are among the most abundant of those we encounter (although these may also include more than one species). Due to their large number, plus the fact that the species is known throughout the country, we usually do not give them much heed. However it does appear that other people actively seek out “kotŋ” seeds. At times we have found rocks covered by fruits that have been cracked open, evidently to consume the nut inside. The fact that many of these drift fruit clearly were at sea for a while in that they have marine growth on them, it would also call into question whether this species is actually of aboriginal origin or is perhaps native.

Also often encountered are the trunks of what are probably sago palms (*Metroxylon sagu* and other species) that have drifted ashore. Chamisso (1821 [comp. Levesque 2001, p. 364]), observed that ‘palms of the torrid zone’ were often deposited on Ratak reefs. In their native range of Indonesia, Malaysia and other parts of Southeast Asia, an edible starch has long been obtained from the pith within their trunks (Gibbons 1993, p. 54; Schery 1972, p. 381). While currently it does not appear that anyone in the Marshalls is extracting this nutri-

tious substance, it is likely the somewhat palatable famine-food described by Wendler (1911, p. 275). The account repeated by Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 140). What evidently was called “bu-iabui” (a name, however, which could was not confirmed and hence modern spelling uncertain) was said to be the “inner part of a type of driftwood...similar to the trunk of a coconut palm [which] was beaten and mixed with arrowroot flour.”

Gardening and Horticulture

Some of the plants which are figured to have arrived on their own, through drift or other means, are edible to some extent, but aside from the possibility of the above mentioned coconut, none are such to qualify as a staple. So the evidence points to the early inhabitants bringing “iaraj” swamp taro (*Cyrtosperma chamissonis*) and “mā” breadfruit (*Artocarpus* spp.) with them when they settled (NBTRMI 2000, p. 21). “Tilaan” or pumice, which came through drift, traditionally was used as a fertilizer (Sachet 1955, pp. 12, 19).

Most reports that have discussed mangroves in the Marshalls have concluded that they must have been introduced by humans. The main reason presented was that these trees were found in the interior of the islands, not along the coast. Chamisso (1821 [comp. Levesque 2001, p. 364]), included “*Rhizophora gymnorhiza*” [= *Bruguiera gymnorhiza*] among cultivated plants. Fosberg (1953, p. 17) agreed with this conclusion, stating “mangroves, at least *Bruguiera*, found in landlocked pools and muddy depressions have been deliberately introduced and planted by the Marshallese.” Others writers have tended to go along with this assumption (NBTRMI 2000, p. 21, Spennemann 1993, pp. 107, 108).

However, when Spennemann (1997, p. 6) took a better look at the drift patterns he encountered, he remarked that this might “have a bearing on the interpretation of the distribution of mangrove species in Eastern Micronesia.”

During our beachcombing for drift material, we have found many hypocotyls (the dangling seed-like seedling which develop while still attached to mangrove trees) of “joñ”

oriental mangrove (*Bruguiera gymnorrhiza*) and “coeak” stilt mangrove (*Rhizophora apiculata* and *R. mucronata*). While these species are known from various atolls in the Marshalls, with “joñ” being relatively common, even on Majuro, the hypocotyls found were on Majuro beaches far from where any trees were growing. Moreover, many of the hypocotyls had growth of barnacles and/or bryozoas, good indicators of time at sea.

Hypocotyls which appeared viable were placed in small containers of freshwater. While no exact inventory was kept, a large number of the “joñ” did both root and sprout, many still growing to this day despite the fact that they have yet to be transferred to suitable wetlands.

“Eoeak” is not known from anywhere on Majuro and is a much rarer anywhere in the country. Of the limited number of hypocotyls found, only a few have proved viable. So far, only four of what is tentatively identified as *R. apiculata* are still alive, and three of the much larger but of what have proved to be much slower growing *R. mucronata*.

Of course, the fact that so many drift hypocotyls proved to be viable does not answer the question as to whether their establishment in the Marshall Islands was through human intervention or not. The seaward mangroves of Nadikdik certainly could have become established on their own; some of the completely landlocked stand, however, more likely were planted. Anecdotal accounts from Jaluit, which has extensive inland mangroves, tell of how one man brought “joñ” from Namdik and planted all around the atoll, instructing people on how to best use the hypocotyl in making canoes and mats.

Some plants which spread through drift are not considered desirable and in this way, would have an impact on agriculture by requiring constancy in their removal. “Kālōklōk” wait-a-bit or nickernut (*Caesalpinia bonduc* and related species), is a famous driftseed in its worldwide range. Chamisso (1821 [comp. Levesque 2001, p. 365]), mentioned finding seeds among the drift they encountered, but only once actually finding a growing plant. Fosberg *et al.* (1979, pp. 96. 97) reported that it had been found on seven atolls. Fosberg (1953, p. 4), nevertheless,

considered it to be ephemeral in that it was “never seen to persist.” However, since it forms such horribly, spiny pestiferous brambles, it is very likely that its low level of survival is on account of diligent weeding programs rather than any delicate nature of the plant. One particular plant has been observed growing in the thickets the across the road by the runway of Majuro has remained for years, likely because it is in an area no one is trying to cultivate.

“Kōjbar” Indo-Pacific yellowwood (*Neisosperma oppositifolium*) spreads through drifting fruit. It is considered to be a climax species in the Marshall Islands (Fosberg 1953, p. 7; NBTRMI 2000, p. 15, Vander Velde 2001). Theoretically, many of the islands should therefore be dominated by this species, yet it actually, it is relatively rare, evidently being kept under control through land clearing for copra farming and other agriculture.

Drifting Away

Even the best of sailors recognize the constant danger of somehow getting off course and drifting away. So it was not just persons from other areas who inadvertently drifted into the Marshalls, many a Marshallese seafarer ended up making an unplanned landfall on a distant land—if they were that fortunate. The well-known Marshallese saying “Mōkajkaj ijajjal ibōtbōt, ekadu tōllok, aetok pelok” is a warning: ‘watch out—you may be being too hasty’ (although meaning more along the lines of ‘you really need to spend time in the bathroom, the way is short, drift on the open ocean is long’), and demonstrates the constant threat of going adrift (pers. comm. W. Mwekto).

Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 174) speculate that, among other reasons, “decline in the population was caused by...being lost at sea during journeys.” In fact, they considered it “common for ships to go off course.”

They cite an incidence about the year 1860 where supposedly 50 boats from Majuro drifted off course from their intended destination in the Rālik chain and ended up drifting all the way to Kapingamarangi, conquering the people and establishing a population of Mar-

shallese there. They, however, questioned the validity of this claim since, as they commented “language alone is enough to refute this” (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 11).

Erdland (1914 [trans. Neuse 1961], p. 61) said that canoes tended to travel together in order to help prevent their being going off course.

Arrival alive at a new location was no guarantee of survival. Even when just being driven from one atoll to another, survivors were often executed. The reason was often for the practical reason of insufficient food (Erdland 1914 [trans. Neuse 1961], p.18).

But many persons were also spared, particularly women (Kramer & Neverman 1938 [trans. Brant & Armstrong 1942], p. 203). Carucci (1992a, pp. 40, 41, 145) records the oral histories of ones now from Kwajalein but had ancestor who drifted from other atolls. Other Marshallese people spoke of this happening in their family—for example, one family from Namu had an ancestor drift there from Mejit. While none of the ones alive have ever seen Mejit, they still hold ties to that island.

Drift did add to the toll on the population during hardship. In times of famine, Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 190) said that, at least according the earlier account of A. Brandeis, children were set to sea after being tied to floats. But it seems that if per chance the little one survived the ordeal and was found on another shore, it was allowed to stay there.

(This acceptance of a drift baby harmonizes with the tale of the lost boy of Ailinglaplap. The story goes that his mother set him in a basket or basin, and when she wasn’t watching, he was washed away to another part of the island—or land, depending upon the version. He was taken in by another couple, but later sought his real parents [Downing *et al.* 1992, pp. 121-124; Kelin 2003, pp. 170-177]).

In times past, only “irooj” and other persons of high stature and rank were considered worthy of burial on land. Upon the death of others, their bodies were wrapped in mats and set adrift¹⁰ (Erdland 1914 [trans. Neuse 1961], pp. 241, 326). An old account by Steinbach, as

retold by Kramer & Nevermann (1938 [trans. Brant & Armstrong 1942], p. 208), describes how the rolled mat was not weighted down by any rocks that would have caused the corpse to sink; instead the parcel was equipped with a small mast and sail to facilitate its departure, transported away out to sea and then let on its own. No one was permitted to look back at the deceased.

Having a corpse wash ashore was not something to be desired. One story related by Tobin (2002, pp. 184-188) tells of how the people of Ujae suffered after the dead body of a woman drifted in and turned out to be an evil spirit, “mejenkwaad.” Evidently though, certain areas were known to have the wind, currents and other conditions that would make it likely that the bodies those departed would actually depart—and not just return to shore again. Certain island and “weto” or landgrant names reflect these properties. For example, on both Kwajalein and Maloelap atolls, there are islets called Āne-bōn, which are defined as “place for floating corpses away” (Abo *et al.* 1979, p. 508; Carucci 1997a, pp. 97, 332). On Mejit island, there is the “weto” called Toon-kūtim, meaning ‘channel or passage of mat used to cover corpses’ or as explained in Abo *et al.* (1976, p. 583): “There is a small passage at this tract from which corpses were floated away.”

UNANTICIPATED INTRODUCTIONS

It appears that two notorious venereal diseases, syphilis and gonorrhea were likely brought to the Marshalls upon the return of persons who had gone off course and made landfall on Kosrae (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 233).

Beyond what drifting people may have brought with them, drift material in itself is completely free from any quarantine—and import duty. And while the understanding of invasive species is unfolding, it does seem that at least some of these undesired plants and animals can travel via drift. Sachet (1955, p. 12) realized that pumice could contribute to the “dissemination of animals from one shore to another” and Jokiel (1989) later actually documented marine organisms regularly rafting on pumice, driftwood and other drift material

which was found on Kwajalein. This method undoubtedly would work for both ‘wanted’ and ‘unwanted’ species.

LEGENDS AND SUPERSTITIONS

Material which mysteriously appears on the beaches from some unknown place of origin would understandably illicit the imagination of those who find it. The world’s largest seed, the coco-de-mer (*Ladoicea maldinica*), was for centuries known only from drift. The magical curative powers attributed to it, along with tales told that grew underwater or in the real Garden of Eden, naturally helped inflate its value to traders¹¹ (Gunn & Dennis 1999, p. 22, 23, 186).

There were also quite a few Marshallese legends and superstitions also connected with drift. Some of these were:

- One superstition was that heavy sheet lighting was a sign that a canoe had drifted off course (Erdland 1914, pp. 14, 340).
- Evidently if such a drifted canoe did survive, the vessel was to taken apart and then reassembled to ensure—along with the aid of an appropriate “spell” that it did not drift away again (Erdland 1914, p. 340)
- At least on one area of Ailinglaplap, there was a stretch of beach where no person was to walk, and if anything drifted ashore, a light rain called “lañ-in-jiarel” would fall (Erdland 1914, p. 212).
- An accumulation of material in a certain whirlpool near Kwajalein was said to indicate that something of importance was to occur, as was said to have happened with the death of an “iroojlaplap” (Carucci 1997a, p. 124).
- Also in relation to the death of a high person, if a dead whale drifted ashore on an eastern shore, it would signify an impending death of an irooj; however if on a western shore, the birth of an “irooj’s” child (Erdland 1914 [trans. Neuse 1961], p. 339).
- Because of being considered imperious to damage and the finest of the driftwoods, “kāmeej,” was used to represent an “irooj;” in contrast, the soft, essentially useless, often shipworm infested driftwood “kānōno” stood for his underlings (Erdland 1914, p. 152).
- A “kāmeej” and a “lo” beach hibiscus (*Hibiscus tileaceus*) were said to have battled on shore of Bikini atoll. The fact that the “lo” won the contest was shown because the “kāmeej” was delegated to the outer shore (Erdland 1914 [trans. Neuse 1961], p. 348).
- A tree trunk supposedly washed up on the beach of Wollet island, Maloelap atoll. It was called “lañeta” and was said to cause people who already had their hunger satisfied to become hungry again (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], p. 78).
- Magical property of “bok-in-Ep” (sand-of-Ep) is told in some legends. Wūllep advised Bōraan to take “sand from Eb” along with old coconut meat in order to travel. The same combination was told to the adoptive sister of the lost boy from Ailinglaplap (Erdland 1914 [trans. Neuse 1961], p. 207; 279). “Bok-in-Ep” was also magically used by Wōdejebato’s sister to raise a sunken, watersoaked log on which they had traveled (Tobin 2002, p. 257).
- Another supposedly powerful substance was “bok-allōñlōñ.” Information concerning it is quite sketchy, but it seems to be accumulations of a marine blue-green bacteria called “sea sawdust” or *Trichodesmium*. Even today when conditions are right, great concentrations and form, and such blooms have been reported in Majuro as well as much of the Pacific (per. comm. D. Jacobson, W. Mwekto; www.marine.uq.au/marbot/significantfindings/trichodesmium)
- The famous story of the girl who ran away from her parents on Mili through the help of her grandmother Lijebake, the hawksbill turtle, involves knowledge of drift. Depending on the version, the girl urges her grandmother to swim on because there was still “the pandanus leaf of the Gilbert Islands, which drifts westward” (Erdland 1914 [trans. Neuse 1961], p. 297; Tobin 2002, p. 160) “chewed pandanus floating,”

(almost certainly meaning “pejpetok” discussed above) (Kelin 2003, pp. 4, 5) or “ri-Pit” meaning Kiribatese people (Downing *et al.* 1992, p. 38), who were known to regularly drift to Mili and other atolls of the Marshalls.

- Another well-known story is from Ujae about the kraken (or giant cephalopod) that attempted to defy being cooked. It told its captures to use “tilaan” for their cooking stone, but because “tilaan” does not deliver much heat, the kraken easily escaped. It was only its captures later decided to instead use “deka lal” that the kraken was cooked and eaten (Erdland 1914, pp. 247-248; Kelin 2003, pp. 156-161).
- Two men who shunned seeing Jebro depart were punished by being set adrift by a storm when they instead when fishing (Erdland 1914, p. 221).
- On Enewetak, when “lait” Portuguese-men-of-war (*Physalia physalis*) come ashore, this is understood to be as an indication that: “A direct transfer of substance takes place between the underside of the earth and the back side of Jebro” (Carucci 1997b, p. 143).
- According to one legend, when an irooj worried feared that his expectant wife was becoming a fear-inspiring “mejankwaad,” he set her to sea with minimal provisions. She drifted to Mejit, survived, gave birth (to a dozen children) and later her husband rediscovered her and was reunited with her (Kelin 2003, pp. 73-80).
- In a story about a “lōrro” (a woman who was so distraught she would fly), when resting on a sandbar, two men who discovered her at first mistook her to be a drift log, but then as dead person who had drifted ashore (Tobin 2002, p. 259).

In fact, a large proportion of the tales dealing with drift, reflect the custom of burial at sea. Often the stories tell husbands killing—or at least attempting to kill—their wives and disposing of their bodies this way.

- A chief with two wives killed one and wrapped up her body and sent her to drift to the west, leaving her son utterly

inconsolable. (Erdland 1914 [trans. Neuse 1961], 256)

- Another wife whose identity was mistaken for a wicked being was speared and thrown into the sea. In this case, she was said to survive and floated to Kili island (Erdland 1914, [trans. Neuse 1961], 286).
- When one pregnant woman was late in delivering her offspring, she too was speared by her husband and set adrift (and she too survived) (Erdland 1914 [trans. Neuse 1961], 299).

CONCLUSION

While drift dispersal has proved to occur commonly to and from the Marshalls, it is far from a foolproof way for any living thing—be it plants, animals or humans—to expand their ranges. This serendipitous mode of colonization is terribly wrought with dangers and uncertainties, but it never fails to stir excitement and wonder.

The numerous islands, beaches and reefs of the Marshall Islands have been ‘catching the drift’ since time immemorial. What was stated about the sea surrounding Krakatau being “highways for species that are well adapted to dispersal on the sea surface” can be said just as well for the Marshalls B albeit the ‘commute’ is considerably longer (Thornton 1996, p. 97).

While drift in the Pacific has captured the attention of many casual beachcombers and serious researchers over the centuries, so many questions remain unanswered.

- Why do some species drift in a arrive viable state but never become established outside their native range?
- Are species which have long been considered to be of aboriginal introduction actually indigenous?
- Or vice versa?
- Based on what Spennemann and Ambrose (1997, p. 192), concluded regarding the piece of obsidian and pumice from Nadikdik, (that the presence of non-local materials need not imply import through travel and trade), how many non-atoll historic objects may have arrived through natural drifting and rafting?
- Or technologies?

- Might not the Marshall Islands, with its isolation, simple environment and trade history, be a location that could well serve as a control for assessing the likelihood of drift versus other means of dispersal?
- From where does what appears to be amber come?
- How will the proliferation of non-organic flotsam and jetsam that now plague the seas and shore effect the normal cycle of plants dependent of drift distribution?
- How will climate change affect the incidence and range of drift?
- Can the history of drift provide insight into this phenomenon?

As with the drift, such questions will undoubtedly continue to flow, with the more investigation generating even further mysteries.

But regardless of these or further questions and answers that arise, taking note of what washes ashore certainly can give a different perspective to the Marshall Islands. Many people when they first come to these atolls feel that they are so isolated, just in the middle of nowhere. However when the impact of drift is considered, instead it becomes apparent that they are in the middle of everywhere!

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EDNOTES

- ¹ For the purpose of this discussion, the term “atoll” will also include the five solitary islands.
- ² The beleaguered salt-water crocodile which showed up on Ailinglaplap Atoll in October 2005 very likely arrived by rafting on logs from Papua New Guinea or some other area of the Western Pacific (pers. comm. M. McCoy).
- ³ Oceanic drift is said to have played major roles in the Christopher Columbus’ discovery of the New World. During time on the Azores and other Atlantic islands, Columbus supposedly encountered drift material of distant origins – pieces of bamboo and worked wood, hot beans and even a couple of dead human bodies. The tale is that these objects helped convince him that there was land out yonder. Later, after his actual search for such land dragged on longer than his crew anticipated and mutiny appeared imminent, an encounter with flotsam provided the needed assurance that land was in fact near (Phillips & Phillips 1992, Young 2004). The above mentioned rare Mary’s bean was a prized talisman in many parts of Europe. It was thought to help women during childbirth, often being passed down from mother to daughter for generations. (Gunn & Dennis 1999, p. 19; Nelson 2000, p. 101).
- ⁴ For as much as possible, the spelling used in this report is from the current Marshallese-English Dictionary of Abo *et al.* (1976). However, some words from older sources have fallen into disuse and a few words which were given anecdotally from local informants and the spelling of these is not certain. They were thus written according to the best approximation that could be made.
- ⁵ While there are no instances of the use of the words “jelaar” nor pine in the older translation of the Bible (Jeje ko Rekojajar undtd.), the new translation (United Bible Societies undtd.) does have pine as an untranslated loanword. Where the new translation uses “pine,” and in a couple instances “cypress,” once “cedar” and once “fir,” the older translation instead uses a modified spelling of fir, “fōr” throughout (1 King

chapt. 5, 1 Chron. 2:8; 2 Chron. 2:5; Cant. 1:17; (Erdland 1914 [trans. Neuse 1961], p. 152).

⁶ The “Repith-urur” whom Chamisso (1817 [trans. Levesque 2001, p. 375]) describe as people cast ashore from another “group of islands,” detailing their “constant wars,” seem to have been “ri-Pit uror” or “murderous Kiribatese.” (Kramer & Nevermann 1938 [trans. Brant & Armstrong 1942], 217).

⁷ The older translation of the Bible uses “aik” for cedar throughout. However, the new translation (United Bible Societies undtd.) simply uses the English loanword “cedar.”

⁸ Legend tells of the sister of Wōdejebato named Luajet – or Miss Ajet – who stayed on an open stretch of Bikini reef because she “smelled bad” (Erdland 1914[trans. Neuse 1961], p. 266).

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⁹ Chamisso did record the sighting of a sperm whale near Wotje in 1817 (Chamisso 1817 [comp. Levesque 2001, p. 365], [trans. Kratz 1986, p. 195]).

¹⁰ According to Erdland (1914[trans. Neuse 1961], pp. 241, 326) however, at least some persons of high rank were also buried at sea, but their funerary bundles were weighted down so that they sank rather than drifted.

¹¹ It is now known to grow only on one area of the Seychelles and now only command a few dollars as a tourist curio (Camerapix 1991, p. 141).

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The Vander Veldes moved to the Marshall Islands almost twenty years ago. Previous to this, Nancy worked in marine biology, providing educational material to schools. She has written over 300 articles for various publications around the world, primarily illustrated stories about marine life but also about other aspects of the natural world. She did the research, writing and illustrating for the RMI National Biodiversity report, in the course of which and afterwards, has investigated extensively the terrestrial botany of the country. She has also written school level science books in Marshallese and scientific papers on the Marshall Islands. Brian came to Micronesia as a toddler, with his father who as an ecologist and science educator. He early on became familiar with the plants of the region and observed dramatic ecological changes over the decades. He has co-authored scientific papers with Nancy. Together they continue to observe the fascinating environment of the atolls of the Marshalls.

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