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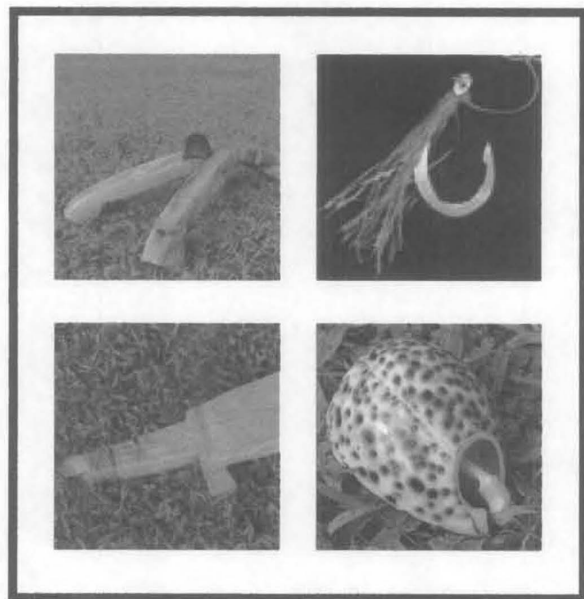
Traditional Marshallese Tools

Carmen C.H. Petrosian-Husa

Alele Report 2004/2

Majuro Atoll, 2004

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***weikan* or *beka* – Pandanus Crusher**

***kããj* – Fish Hook**

***raanke* – Coconut Scraper**

***jikwi* – Breadfruit Peeler**

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¹ Map 2 was scanned with the help of the library of the College of the Marshall Islands.

² If not otherwise indicated photographs were taken by Carmen C.H. Petrosian-Husa, ethnographer of the Historic Preservation Office and are © of the Historic Preservation Office of the Marshall Island.

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Forward

In the process of background research, concerning traditional tools, the following 35 tools have been identified, (leaving out all gear associated with canoes and war). Of these only the indicated ones have been documented:

- | | |
|--|-----------------------------|
| 1. adze | • 2. fishing hooks |
| 3. sharpening stone | 4. sharpening device |
| • 5. <i>jikwi</i> - shell to peel breadfruit | 6. wood to make fire |
| 7. fire hook | 8. needles for making nets |
| 9. fish traps | • 10. pandanus crusher |
| • 11. <i>raanke</i> - coconut scraper | 12. tools for tattooing |
| 13. medicine container | 14. rope |
| 15. food pounder | 16. bowls |
| 17. coconut shells for water | 18. big clams |
| 19. fishing nets | 20. club for killing sharks |
| 21. spears for fishing | 22. fans |
| 23. torches | 24. big coconut opener |
| 25. small coconut opener | 26. knives |
| 27. spoons | 28. breadfruit nets |
| 29. oil presses | 30. plates |
| 31. strainer for arrowroot | 32. big drill |
| 33. small drill | 34. files |
| • 35. pandanus pounder | |

This report accompanies a video project and should not be seen on its own but together with the visual documentation. Only the video and the photographs can make the process of the making of these tools fully understandable.

Looking at these four traditional tools of Marshallese culture and their making, which is the topic of this report, it cannot be overlooked that the informant did not use a single traditional tool himself, but was very skilled handling all sorts of modern tools from the hardware store. This is a clear indication how important this project is and will be in the future.

The following report is the result of research conducted from October 2003 to July, 2004 in the Republic of the Marshall Islands. The research was conducted by the anthropological team of the Historic Preservation Office of the Republic of the Marshall Islands. The projects was all sponsored by the Republic of the Marshall Island's Historic Preservation Office and funded by the Historic Preservation Fund, National Park Service, Department of the Interior.

Our thanks go to our colleagues at the National Park Service, Paula Falk Creech, Mark Rudo, and David Look for their assistance and guidance. This research could not have been conducted without the assistance of many individuals.

Foremost our thanks go to Raynard Kabot, who not only provided expert knowledge but humor and team-spirit. The staff of the Alele-Museum was always helpful and assisted to overcome obstacles:

Bernice Jaosh, Director of the Alele Museum, helped with advise, translation and organization;

Hespy John, filmed the documentation and translated for the ethnographer,

Junior Aini scanned illustrations; and

Yubok Lokia drew one illustration.

Many more people participated in the completion of this project and are mentioned here in alphabetical order:

Virgil Alfred from Arno provided the pearl shells for the production of the hook;

Elke Ballweg took time to proofread this report;

Ione DeBrum gave background information about today's *mokwan* production and her involvement in it;

Lois Engelberger provided input, proofreading and help with pandanus;

Ingrid Heermann, Linden Museum in Stuttgart, Germany, provided photographs of a Marshallese fishing hook from the collection of the Museum;

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The library, College of the Marshall Islands, allowed scanning images from German sources;

Josepha Maddison-Hill, Historic Preservation Office, Ministry of Internal Affairs, proofread this report and provided her pandanus crusher to be included in this survey;

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Nancy Vander Velde, assisted to identify plants, helped with resources, gave guidance and proofread the report;

Payless Supermarket in Majuro allowed photographs to be taken in the store;
Robert Reimers Enterprises allowed photographs to be taken in their hotel and
store;
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and
Frank R. Thomas, Historic Preservation Office, Ministry of Internal Affairs,
proofread this report

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Carmen C. H. Petrosian-Husa
Majuro Atoll, Marshall Islands
September 2004

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N.W., Washington, DC 20240.

I. INTRODUCTION

1.1. Project Objectives.

The purpose of this report was to record the process of making four traditional Marshallese tools: 1. *weikan* or *beka*, the pandanus crusher

2. *kāāj*, a fishing hook

3. *raanke*, the coconut scraper

4. *jikwi*, the breadfruit peeler.

This was accomplished by filming and photographing the process as well as by interviewing the informant and compiling background information.

1.2. Evaluation of Research Design and Methods Used.

A) Background Research.

Background research relied heavily on the 18 volumes of German sources, compiled by Dirk Spennemann and housed in the Historic Preservation Office in Majuro. Without these sources this report could not have been written.

In the course of background research a big variety of sources was used. As pandanus was and is such an important food item in the Marshall Islands, many travelers had mentioned it or even given detailed accounts about it and its use. For instance Adelbert von Chamisso, who was one of the first ones who describes his travels in the Radak Chain in 1817, or the ethnologists Augustin Erdland and Augustin Krämer, who did research in the Marshall Islands at the time of the German colonial period. Fishing, which is such a vital part of Marshallese life, is mentioned in many of the early publications and has impressed the early visitors to the Marshall Islands. The coconut palm has often been described as the tree of life in pacific cultures. This certainly also applies to the Marshallese culture. As its use and the practice to scrape coconut meat is so widespread considerable less information about the coconut scraper could be found. This is also true for the breadfruit scraper, which is such an inconspicuous tool that it did not attract much attention from early travelers.

Japanese sources are actually missing in this report due to lack of access to such files as well as difficulty in reading them. After WWII, when America governed the Marshall Islands as a Trust Territory, quite a few reports were written about the Marshallese way of life as well as about the material culture and the nature of the islands.

All of this information has been given consideration and some have been included in order to give an overall perspective of the topic.

B) Documentation.

This project was started in 2003 with the documentation of the making of a pandanus leaf pounder. This was the first traditional Marshallese tool that was documented. In 2003/2004 the second part of the project started and four more tools (pandanus crusher, coconut scraper, fishing hook and breadfruit peeler) were documented. We consider this an ongoing project. In the coming years it will explore all aspects of Marshallese tools.

The second part of the project was scheduled to start in September 2003. But, due to sickness, the selected informant canceled his participation. Accordingly, in the beginning of December the project was rescheduled and an announcement was made on the Government V7AB Radio station in the weekly radio program of the Alele Museum in the local news. On Monday December 9, 2003, the informant contacted the Museum and offered his assistance, on December 17, 2003, the project started.

This report is accompanied by a video documentation documenting the process of making each individual tool. Copies of these videos are at the Alele Museum in Majuro as well as at the U.S. National Park Service.

Partial information about this project is also accessible online at <http://www.alele.org/Alele/tools/tools.html>.

1.3. Limitations of Research.

The ethnographer, being a woman and not a 'fisherman' herself, had to get accustomed with general fishing terms and technologies in order to understand and comprehend the Marshallese concept of fishing and its ingenuity. This was only accomplished on a pure theoretical basis.

Besides the extensive background research of texts of mostly German provenience it was not possible to visit more outer islands and record their fishing traditions as well as their views and opinions about traditional fishing. Also concerning information about ciguatera, case studies and treatments, it was not possible to get more information from the hospital in Majuro. Finally not much data concerning modern fishing techniques and many related topics have been included, thus, this report is far from complete and a long term and more detailed study should be encouraged.

1.4. Previous Research.

None of the sources from the German colonial time deals exclusively with fishing. But fishing techniques, taboos and tools are often mentioned. After WWII when several American anthropologists came to the Marshalls to do research, fishing was a topic of great interest for them. Some topics of this report have been mentioned in the Historic Preservation Preliminary Reports of the Anthropological Surveys of Arno and Wotho Atoll.¹

1.5. The Informant.

Raynard Kabot was born 1951 in Jaluit where he also attended 8 grades of Jabor elementary school. He worked as a fisherman and earned money making copra. He married in Jaluit Atoll and later moved to Ebeye in Kwajalein Atoll. Since 2003 he is living in Majuro.



Fig. 1. Raynard Kabot on the first day of the project.

The informant is a skilled canoe builder (*wa* and *riwut*). He built a lot of common household tools such as are still used today (*beka*, *raanke*). He learned his skills by watching other family members working with wood, and got some instructions from his father, too.

¹ Preliminary report: Anthropological Survey of Arno Atoll, HPO Report 2004/3 and preliminary report: Anthropological Survey of Wotho Atoll, HPO Report 2004/2.

For the production of the Marshallese tools the informant, Raynard Kabot did not use any traditional tools but employed an ax, a hammer, a chisel, a file, a motor drill, a grinder, a handsaw, a pencil, a brush, sand paper, commercial glue, varnish, etc.



Fig. 2. Tools of the Informant, used for the production of traditional Marshallese tools.

1.6. Crew.



Fig. 3. Raynard Kabot, Hespy John and Renni Titus.

The project was conducted by the Alele Museum staff. The ethnographer, Carmen C.H. Petrosian-Husa, tried to keep track of the project. Cameraman Hespy John made the video documentation and translated for the ethnographer. Historic Preservation Officer Ruben Junior Aini scanned images, helped with background information and took care of Marshallese spelling and handyman Rennie Titus helped cutting down trees.

1. 7. Technical Information.

A) List of Tools that were made.

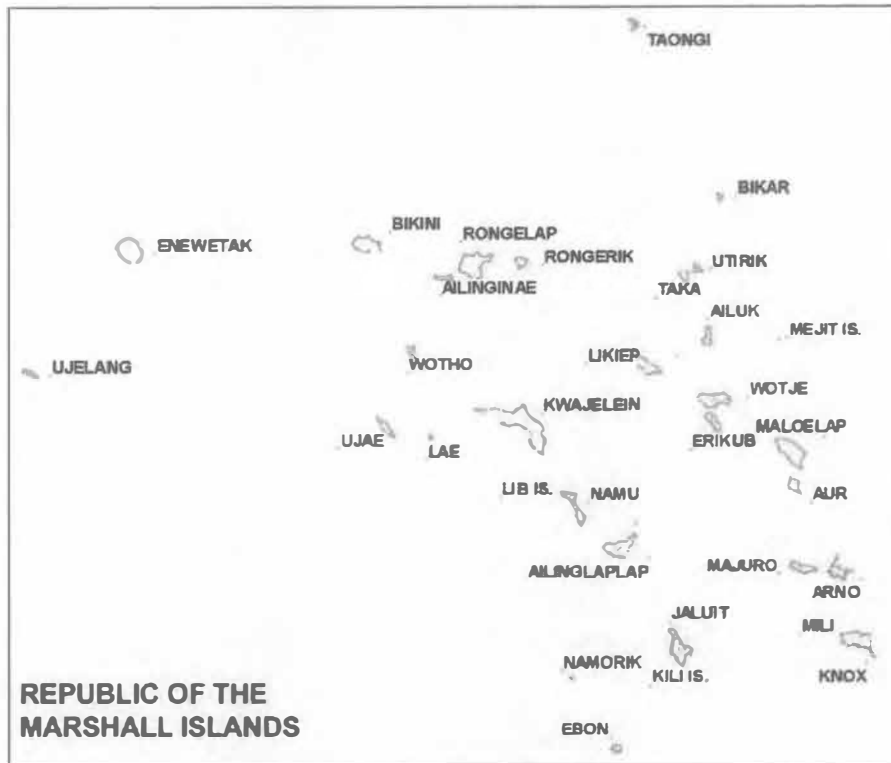
1. *weikan* or *beka* - pandanus crusher -
2. *kāāj* - fishing hook -
3. *raanke* - coconut scraper -
4. *jikwi* - breadfruit peeler

B) Duration of the Project.

The informant started working on December 17, 2003 and finished all tools on February 11, 2004. Afterwards additional interviews were made with Raynard Kabot, as well as with other informants on Wotho and Arno Atolls. Background research started well beforehand and continued until July 2004.

C) Equipment.

Filming was done with a 1 Canon ES 8400V, 8mm Video Camcorder. Photographs were taken with a Canon EOS D60 digital camera, a 28-135mm zoom, and 2 512 MB compact flash cards as well as with an Olympus Cammedia D-340R Digital Camera and a 16 MB -3.3 card.



Map 1. Republic of the Marshall Islands.

1.8. History of the Marshall Islands.

First there were two serpents or worms. They stayed in a shell where they developed into a human form. The male was called Wulleb and the female was Lehman, Woman Rock. In order to enlarge the world Wulleb used a stick and lifted the arch of the shell. Thus he expanded the sky to its present height and the ocean to what we know. From a boil on Wulleb's forehead emerged Lewoj and Lanej, who were sent to the sky to establish the stars. Lejman also had two female offspring, Lino, the tidal wave and Ni, the coconut.²

There are many variations of creation accounts. Despite their differences they introduce the key characters important to Marshallese cosmology, such as Wulleb, Letao, etc.

The people of the Marshall Islands refer to their parallel-chained archipelago as *Aelon Kein*, "These Atolls." According to folklore the first discoverers and settlers were a handful of wayfarers seeking an uninhabited autonomous area where they could live.³

² Raymond, 1899:9.

³ Hart, 1992.

What little we know about early Marshallese comes from oral history and early accounts of explorers.

Marshallese autonomy was threatened when the first of eight known Spanish ships passed through the area. The first recorded sighting, probably Bokak Atoll, was made by Alonso de Salazar, commanding the *Santa Maria de la Victoria*, but no contact was made.⁴ In 1529 contact was made by Alvaro de Saavedra of the *Florida* which laid anchor to take provisions at Enewetak or Bikini and stayed for eight days. He also discovered Utrök, Taka, Ujelang, and made landings at Rongelap and Ailinginae. The Spanish flagship *Santiago* and five other ships in the expedition under Ruy Lopez de Villalobos is credited for the western discovery of Wotje, Erikub, Maloelap, Likiep, Kwajalein, Lae, Ujae, and Wotho. Landings were made on some of the islands.⁵

In 1565, Alonso de Arellano of the Legaspi expedition sighted Likiep, Kwajalein and an island thought to be Lib⁶ while Legaspi himself is credited with sighting Mejit, Ailuk and Jemo. Some trading was done at Mejit.

The following year the mutineer Lope Martin commanding the *San Jeronimo* made several sightings and was eventually stranded in the Marshall Islands, probably on Ujelang. Two years later the Spanish ships, *Los Reyes* and *Todos Santos*, under Alvaro de Mendana went ashore at what is probably Ujelang. Namu was also thought to be sighted.⁷

Fifty seven years passed before another vessel is reported to pass through the Marshall Islands' chains. The Dutch ship *Eendracht* and ten other vessels of the Nassau fleet commanded by Admiral Gheen Schapenham sighted Bokak.⁸ In spite of Spain's annexation of the Marshall Islands in 1686, the Spanish established no trading post, trade routes, or left any lasting influence.

In 1767 Captain Samuel Wallis of the British ship *Dolphin* sighted what is thought to be Rongerik and Roneglap.⁹ Even though the Spanish were the first known westerners to see the Marshall Islands credit is given to Captain William Marshall, commander of the *Scarborough*, and to Thomas Gilbert, commander of the *Charlotte* for

⁴ Levesque 1992a; Sharp, 1960:12.

⁵ Levesque 1992a; Sharp, 1960:28.

⁶ Sharp, 1960.

⁷ Levesque, 1992a.

⁸ Hezel, 1979.

⁹ Sharp, 1960:108; Hezel, 1979.

the discovery or more appropriately the rediscovery of the Marshall Islands in 1788. Marshall and Gilbert mapped these island groups and traded with the various atolls. They are the first westerners to sight Mili, Arno, Majuro, Aur, and Nadikdik.¹⁰ They also sighted the previously discovered Wotje, Erikub, Maloelap, and Ailuk and called these newly found islands after the 1. Lord of the British Admiralty 'Lord Mulgrave-Islands'.

Captain Henry Bond aboard the British merchantman vessel *Royal Admiral*, sighted Namdrik and Namu in 1792. Two years later the British ship *Walpole*, under the command of Captain Thomas Butler, sighted Enewetak. Thomas Dennet was the first westerner to sight Kili as well as reporting on Ailinglaplap, Lib, and doing some trading on Namu in 1797. Other vessels sailed through the area, including the British ship *Hunter*, the British brig *Nautilus*, the ship *Ann & Hope* of Providence, *Ocean*, *Herald*, and *HMS Cornwallis*, to name a few. These ships sighted atolls and islands that had been previously reported but did not stop and trade. Jaluit was sighted by the *Rolla* in 1803 and again in 1809 by Captain Patterson of the British merchant brig *Elizabeth*, both of which landed and did some trading.¹¹

The first scientific exploration of the Marshalls was conducted by a Russian, Otto von Kotzebue, in 1816-17 and 1824. It is during this time that first significant contact between Europeans and Marshallese was made. Von Kotzebue and his crew spent several months in the Ratak Islands in 1817 and 1824, specifically Wotje, Maloelap, and Aur Atolls.¹²

The account left by this expedition provides the first early ethnographic material including an interesting description of how Kotzebue was urged to help Lōmade defeat Latete, a powerful southern Ratak *Irooj*, and become *Irooj* of all Ratak. Although Kotzebue declined the offer, his influence was noted. Traditional warfare practices began to change soon after Kotzebue's first visit. Metal hatchets given as gifts were attached to wooden poles. Lōmade's troops used these new weapons to defeat the powerful *Irooj* and establish control over the Ratak Chain.¹³

Other ethnographic observations come from Lay and Hussey (1828), who survived the *Globe* mutiny at Mili Atoll, and Paulding (1831), a U.S. Navy lieutenant, who helped to retrieve Lay and Hussey. These early observers published accounts, which

¹⁰ Sharp, 1960:154.

¹¹ Sharp, 1960:173, 178, 183, 191; Hezel, 1979, 1983.

¹² Kotzebue, 1821; 1830; von Chamisso, [1836] 1986.

¹³ Erdland, 1914; Krämer und Nevermann, 1938.

give us an insight to traditional personal appearance, manners, food, dwellings, and to a lesser extent, facets of political and social organization as reflected by traditional practices.

Prospects of profitable trade lured German entrepreneurs into the Marshall Islands in the latter part of the 19th Century. Subsequent contact with Europeans gradually increased as whalers concentrated their activities in the region. They were hunting to provide lamp oil to meet European and American demands. With disruptive and intolerant whalers as well as English blackbirders, both being in search of cheap labor to work the mines and plantations in the New World and Australia, encounters turned hostile. Numerous ships were attacked by the Marshallese and the crews killed; brutal retaliation followed. The mood of contact in the first half of the 19th Century was one of confrontation.¹⁴

The treacherous reefs, reduced numbers of whales and the new method of distilling of kerosene from crude oil soon put the whalers out of business. The blackbirders however continued their raids until the 1870's.

In 1857 two American missionaries from the American Board of Commissioners for Foreign Missions, Congregationalists from the New England area, succeeded in setting up operations on Ebon (where as recently as 1852 a ship from San Francisco had been attacked and the entire crew killed).¹⁵ The Marshallese *Irooj* opposed the missionaries and the establishment of new congregations throughout the 1860s because it eroded their power. This loss of power was somewhat alleviated by the establishment of permanent trading stations, as the demand for copra rapidly increased. The chiefly power base gradually shifted from control over the land to control over the trade between the Marshallese and the foreigners.¹⁶ Ebon remained the mission center, from which occasional trips were made throughout the southern atolls, until in 1880, when the station was moved to Kosrae in the Eastern Carolines.

Changes in the Marshallese way of life had been rapid and extensive. The dominant contact with the outside world had been through missionaries sent or trained by the American Board. Yet virtually no ethnographic description is to be found among the voluminous records kept by the missionaries. Instead they were "not only indifferent, but supremely scornful of the religious beliefs [of the Marshallese]. They tried to extinguish

¹⁴ Hezel, 1979, 1983; Dye, 1987.

¹⁵ Hezel, 1979.

¹⁶ Dye, 1987.

them completely and to destroy every trace of them.¹⁷ The ethnography summarized by the Germans, Erdland (1914) and Krämer and Nevermann (1938), coincided with major structural changes in the Marshallese way of life. Writing in about 1905, the German ethnographer and priest Erdland commented, "the present generation no longer has any exact knowledge of the inner coherence of the ancient traditions."¹⁸

Other factors also influenced these changes. The copra trade dates from about 1860 in the Marshall Islands and American, Australian and German firms often had resident traders on the various atolls. Beachcombers added to the resident white population, often filling the role of trader as well.

A) German Time.

In 1885 the Marshall Islands became a protectorate of Germany, as the Marshall Islands were not under the sovereignty of any civilized state".¹⁹ During the German era,



Fig. 4. German 'Reichsadler'.

which lasted until 1914, the atolls were visited regularly, by traders, missionaries, and administrative officials. Administration of the area was carried out by the German trading company, *Jaluit Gesellschaft*. This firm which resulted from a merger of companies active in the area, Robertson and Hearnheim, and *Deutsche Handels - und Plantagengesellschaft* (D.H.P.G.) (formerly *Johann Godefroy und Sohn*), had exclusive trading rights in the Marshalls. Despite complaints about this monopoly by the Australian firm Burns Philip and Co., the New Zealand company, Henderson and MacFarlane, and others, the German government

continued to act on the advice of the *Jaluit Gesellschaft* until 1902 when it assumed direct administration of Micronesia.²⁰

This form of administration, with primarily an economic focus, had little impact on the health and educational level of the Marshallese. In this regard, the missionaries were of greater importance. Select groups of Marshallese were educated in the German language to serve as interpreters and the services of a doctor were available on occasion.

¹⁷ Knappe, 1888.

¹⁸ Erdland, 1914:307.

¹⁹ Pauwels, 1936.

²⁰ Hezel, 1983.

Copra was the main product of the Marshalls and production was stimulated by taxes assessed through the traditional leaders as well as through the availability of Western goods. This form of indirect rule strengthened the traditional political organization of the Marshallese, while the German administration dealt mostly with conflicts between foreigners and the *Irooj*.²¹

Warfare between the island *Irooj* was eliminated, an act which froze the relative social positions of the *Irooj* and their *jowi* (clan) and created a condition of inflexibility in the social system; in addition it allowed increased trading and missionary activity and thus contributed to more rapid cultural change.²² German ethnographers were active in this period and it is largely through their efforts, especially in the many publications of Augustin Erdland, that much is known of the traditional way of life.²³

B) Japanese Time.

In 1914 at the beginning of World War I, the Marshall Islands were taken from Germany by Japan. They shifted to a system of direct rule through a set of community officials and the administrative staff was expanded. Traders of other nationalities were excluded and the Japanese attempted to expand copra production. Protestant and Catholic missionary activity was allowed to continue unhampered, and in the general the Marshallese appear to have gotten on well with the Japanese.²⁴ The Japanese did conduct ethnographic research, however most of this material has not yet been translated into English.

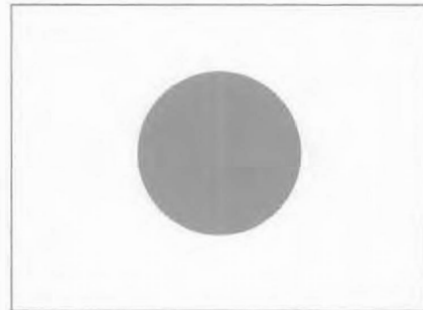


Fig. 5. Japanese flag.

The Japanese military, through the South Seas Defense Corps, governed the Marshalls until 1918. From 1918 until 1920, a combined civilian and military government was in charge. In 1920 Japan was awarded Micronesia as a Class 'C' mandate by the League of Nations (although they continued to submit annual reports through 1937). After 1933, the Japanese considered the Marshalls and the rest of Micronesian mandate an integral part of the Japanese Empire.²⁵ During the Japanese era,

²¹ Hiery, 1995.

²² Spoehr, 1949.

²³ Augustin Erdland, was a priest who lived for many years on the Marshall Islands.

²⁴ Spoehr, 1949.

²⁵ Peattie, 1988.

the administration had several goals; the economic development of Micronesia, the use of the islands as an immigrant settlement for Japan's rapidly increasing population, the Japanization of the islanders through education, language training, and enforced cultural change, and eventually, the use of the islands for military bases in anticipation of World War II.²⁶

For the Marshallese improvement in health and sanitation were minimal. The "availability of adequate medical care was directly related to one's ability to pay" and despite a sliding fee scale, "the poorer and generally unhealthier native received less care".²⁷

Education was also segregated and of differential quality. Ethnic Japanese were offered a school system identical to the one in Japan, while the Marshallese received three years of primary education consisting mostly of Japanese language instruction and ethics classes, with an additional two years for the more promising students.²⁸

The Japanese administration also attempted to make a number of changes in the Marshallese social and political organization. They appointed non-*Irooj* Marshallese leaders, which was contrary to the existing political structure, thus weakening the position of the traditional leader.²⁹ The Japanese also attempted to change the Marshallese social organization of matrilineality to conform to the Japanese system of patrilineality, more like their own system, with little success.

In the early 1930s, Japan began to construct fortifications on Kwajalein, Enewetak, Jaluit, Wotje, Mili, and Maloelap. Marshallese were conscripted to labor on these buildings and were resettled.³⁰ World War II started in 1941. In 1944, U.S. forces concentrated on gaining supremacy in the Pacific. Kwajalein, Majuro, and Enewetak were captured within one month. All of the other atolls except Wotje, Maloelap, Mili, and Jaluit were checked for Japanese in the next two months. In those bypassed atolls, the Marshallese escaped or were removed under cover of night and resettled temporarily on Majuro, Arno, or Aur atolls.³¹ The U.S. fortified Enewetak and Kwajalein atolls as military bases.

²⁶ Peattie, 1988.

²⁷ Shuster, 1978.

²⁸ Hezel, 1995.

²⁹ Bryan, 1972.

³⁰ Peattie, 1988.

³¹ Smith, 1955.

C) US Trust Territory of the United Nations.

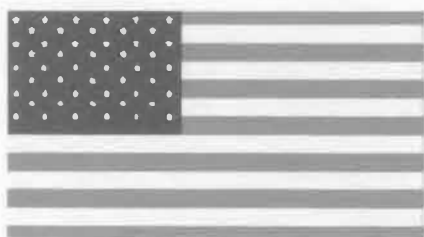


Fig. 6. American flag.

After World War II, the United States took over trusteeship of the Marshall Islands. In this time extensive ethnographic research was conducted in the Marshall Islands. Beginning with Spoehr's work on village life in Majuro (1949), ethnographers have concentrated on community studies. The primary sources are Mason (1947, 1954) whose focus is economic organization; Kiste (1967, 1974) who deals with resettlement issues, Davenport (1952, 1953), and Chambers (1969, 1972) who concentrates on oral traditions.

During this period, from June 30, 1946, to August 18, 1958, the United States also conducted 67 underwater surface and atmospheric tests of atomic and thermonuclear weapons in the Marshall Islands.³²

	Date	Site	Type	Yield (kt.)	Operation	Test
1.	6/30/46	Bikini	Airdrop	21.00	Crossroads	Able
2.	7/24/46	Bikini	Underwater	21.00	Crossroads	Baker
3.	4/14/48	Enewetak	Tower	37.00	Sandstone	Xray
4.	4/30/48	Enewetak	Tower	49.00	Sandstone	Yoke
5.	5/14/48	Enewetak	Tower	18.00	Sandstone	Zebra
6.	4/7/51	Enewetak	Tower	81.00	Greenhouse	Dog
7.	4/20/51	Enewetak	Tower	47.00	Greenhouse	easy
8.	5/8/51	Enewetak	Tower	225.00	Greenhouse	George
9.	5/24/51	Enewetak	Tower	45.50	Greenhouse	Item
10.	10/31/52	Enewetak	Surface	10,400.00	Ivy	Mike
11.	11/15/52	Enewetak	Air Drop	500.00	Ivy	King
12.	3/1/54	Bikini	Surface	15,000.00	Castle	Bravo
13.	3/26/54	Bikini	Barge	11,000.00	Castle	Romeo
14.	4/6/54	Bikini	Surface	110.00	Castle	Koon
15.	4/25/54	Bikini	Barge	6,900.00	Castle	Union
16.	5/4/54	Bikini	Barge	13,500.00	Castle	Yankee
17.	5/13/54	Enewetak	Barge	1,690.00	Castle	Nectar
18.	5/2/56	Bikini	Air Drop	3,800.00	Redwing	Cherokee
19.	5/4/56	Bikini	Surface	40.00	Redwing	Lacrosse
20.	5/27/56	Enewetak	Surface	3,500.00	Redwing	Zuni
21.	5/27/56	Bikini	Tower	0.19	Redwing	Yuma
22.	5/30/56	Enewetak	Tower	14.90	Redwing	Erie
23.	6/6/56	Enewetak	Surface	13.70	Redwing	Seminole
24.	6/11/56	Bikini	Barge	365.00	Redwing	Flathead

³² U.S. Department of Energy, United States Nuclear Tests, Nuclear Claims Tribunal.

25.	6/11/56	Enewetak	Tower	8.00	Redwing	Blackfoot
26.	6/13/56	Enewetak	Tower	1.49	Redwing	Kickpoo
27.	6/16/56	Enewetak	Air Drop	1.70	Redwing	Osage
28.	6/21/56	Enewetak	Tower	15.20	Redwing	Inca
29.	6/25/56	Bikini	Barge	1,100.00	Redwing	Dakota
30.	7/2/56	Enewetak	Tower	360.00	Redwing	Mohawk
31.	7/8/56	Enewetak	Barge	1,850.00	Redwing	Apache
32.	7/10/56	Bikini	Barge	4,500.00	Redwing	Navajo
33.	7/20/56	Bikini	Barge	5,000.00	Redwing	Tewa
34.	7/21/56	Enewetak	Barge	250.00	Redwing	Huron
35.	4/28/58	Nr Enewetak	Ballon	1.70	Hardtacki	Yucca
36.	5/5/58	Enewetak	Surface	18.00	Hardtacki	Cactus
37.	5/11/58	Bikini	Barge	1,360.00	Hardtacki	Fir
38.	5/11/58	Enewetak	Barge	81.00	Hardtacki	Butternut
39.	5/12/58	Enewetak	Surface	1,370.00	Hardtacki	Koa
40.	5/16/58	Enewetak	Underwater	9.00	Hardtacki	Wahoo
41.	5/20/58	Enewetak	Barge	5.90	Hardtacki	Holly
42.	5/21/58	Bikini	Barge	25.10	Hardtacki	Nutmeg
43.	5/26/58	Enewetak	Barge	330.00	Hardtacki	Yellowwd
44.	5/26/58	Enewetak	Barge	57.00	Hardtacki	Magnolia
45.	5/30/58	Enewetak	Barge	11.60	Hardtacki	Tobacco
46.	5/31/58	Bikini	Barge	92.00	Hardtacki	Sycamore
47.	6/2/58	Enewetak	Barge	15.00	Hardtacki	Rose
48.	6/8/58	Enewetak	Underwater	8.00	Hardtacki	Umbrella
49.	6/10/58	Bikini	Barge	213.00	Hardtacki	Maple
50.	6/14/58	Bikini	Barge	319.00	Hardtacki	Aspen
51.	6/14/58	Enewetak	Barge	1,450.00	Hardtacki	Walnut
52.	6/18/58	Enewetak	Barge	11.00	Hardtacki	Linden
53.	6/27/58	Bikini	Barge	412.00	Hardtacki	Redwood
54.	6/27/58	Enewetak	Barge	880.00	Hardtacki	Elder
55.	6/28/58	Enewetak	Barge	8,900.00	Hardtacki	Oak
56.	6/29/58	Bikini	Barge	14.00	Hardtacki	Hickory
57.	7/1/58	Enewetak	Barge	5.20	Hardtacki	Sequoia
58.	7/2/58	Bikini	Barge	220.000	Hardtacki	Cedar
59.	7/5/58	Enewetak	Barge	397.00	Hardtacki	Dogwood
60.	7/12/58	Bikini	Barge	9,300.00	Hardtacki	Poplar
61.	7/14/58	Enewetak	Barge	Low	Hardtacki	Scaevola
62.	7/1/58	Enewetak	Barge	255.00	Hardtacki	Pisonia
63.	7/22/58	Bikini	Barge	65.00	Hardtacki	Juniper
64.	7/22/58	Enewetak	Barge	202.00	Hardtacki	Olive
65.	7/26/58	Enewetak	Barge	2,000.00	Hardtacki	Pine
66.	8/6/58	Enewetak	Surface	Fizz	Hardtacki	Quince
67.	8/18/58	Enewetak	Surface	0.02	Hardtacki	Fig

Table 1. List of atomic tests in the Marshall Islands.

The most powerful of those tests was the "Bravo" shot, a 15 megaton device detonated on March 1, 1954, at Bikini atoll. That test alone was equivalent to 1,000 Hiroshima bombs. While the Bravo test is well known, it should be acknowledged that 17 other tests in the Marshall Islands were in the megaton range and the total yield of the 67 tests was 108 megatons, the equivalent of more than 7,000 Hiroshima bombs. From 1945 to 1988, the U.S. conducted a total of 930 known nuclear tests with a combined yield estimated to be 174 megatons. Approximately 137 megatons of that total was detonated in the atmosphere. In other words, while the number of tests conducted in the Marshall Islands represents only about 14% of all U.S. tests, the yield of the tests in the Marshalls comprised nearly 80% of the atmospheric total detonated by the U.S.³³



Fig. 7. Detonation of Bravo.

Numerous Marshallese have suffered from cancers, leukemia and other life-threatening diseases directly connected to nuclear radiation poisoning.

In 1960 the US Army announced that Kwajalein had been given 'a brand new lease of life'. Once again, Marshallese land was to be used for military experiments to try out the accuracy of missiles. Kwajalein was to be used as target practice for intercontinental ballistic missiles (ICBMs), fired from Vandenberg Air Base in

³³ <http://nuclearhistory.tripod.com/testing.html>.

California, 4,800 miles away. Testing of intercontinental missiles continues today. Under the terms of the Revised Compact of Free Association the United States will retain rights to the Kwajalein atoll until 2016.³⁴ At the time of writing the Kwajalein landowners are reluctant to renew the lease for Kwajalein under the former conditions.

The American Trusteeship of the Marshall Islands brought preparation for greater self governance: the Congress of Micronesia, schools with an English curriculum, and Peace Corps Volunteers. Until 1996 hundreds of volunteers are dispatched to the remotest atolls and islands.

D) Republic of the Marshall Islands.



Fig. 8. Flag of the Republic of the Marshall Islands.

In 1979 the government of the Marshall Islands is officially established and the country becomes self governing with *Iroojlaplap* Amata Kabua elected as the first president of the Marshall Islands. One year later the Airline of the Marshall Islands (AMI) begins operation serving eight locations; Enewetak, Bikini, Kwajalein, Mili, Likiep, Maloelap, Wotje, and Majuro. In 1982 the official name is changed to the Republic of the Marshall Islands (RMI).

In 1983 voters in the RMI had approved the Compact of Free Association with the United States, in 1986 the U.S. Congress approved the Compact, which granted the RMI its sovereignty and provided for aid and U.S. defense of the islands in exchange for continued U.S. military use of the missile testing range at Kwajalein Atoll. In 1990 the UN Security Council terminates the RMI's trusteeship status, and, in 1991, the RMI joins the United Nations.

1988 the Nuclear Claims Tribunal started addressing personal injury and property claims resulting from the nuclear testing in the Marshall Islands.³⁵ In 1994, the U.S. Department of Energy began releasing thousand of previously classified nuclear test era documents, many of which confirmed the wider extent of the fallout contamination in the Marshall Islands, and a five-year study of 432 islands in the Marshall Islands showed that 15 atolls and single islands - almost half of this nation - were dusted by radioactive fallout from the U.S. nuclear weapons tests of the 1950s.³⁶ As a result of this officials of

³⁴ http://www.umc-gbcs.org/getinvolved/viewarticle.php?csa_articleId=205.

³⁵ <http://nuclearhistory.tripod.com/testing.html>.

³⁶ <http://resourcescommittee.house.gov/106cong/fullcomm/99may11/debrumt.htm>.

the Marshall Islands testified before President Clinton's Advisory Committee on Human Radiation Experiments in Washington, D.C., stating that fallout exposed many more than the four atolls acknowledged by the U.S. government, and that islanders were purposefully resettled on contaminated islands so the U.S. could study the long-term effects of radiation.³⁷ In 2004, at the time of writing these compensation claims have not been settled. Today, as a result of American testing, about twenty percent of the land of the Marshall Islands is unavailable to the people, because of toxic radioactive wastes due to the nuclear testing, and because of continued use, principally at Kwajalein, by the United States.³⁸

Amata Kabua died in 1996, serving his 5th term as president of the Republic of the Marshall Islands, and his cousin Imata Kabua was selected to finish the term. In 2000, Kessai Hesa Note was elected as president. Under his term the First Compact of Free Association expired, and, in 2003, the Second Compact of Free Association came into effect and Kessai Hesa Note is reelected as president.

³⁷ <http://resourcescommittee.house.gov/106cong/fullcomm/99may11/debrumt.htm>.

³⁸ http://www.umc-gbcs.org/getinvolved/viewarticle.php?csa_articleId=205.

II. ENVIRONMENTAL SETTINGS.

2.1. Physiographic and Biological Setting.

Located in the central Pacific between 4° and 15° north latitude and 160° and 173° east longitude, the Republic of the Marshall Islands consists of 29 low lying coral atolls and five coral islands. Twenty-two of the atolls and four of the islands are presently inhabited. The atolls and islands are situated in two almost parallel chain-like formations. The eastern group is the Ratak (Sunrise) Chain and the western is the Ralik (Sunset) Chain, which together extend about 700 miles (1,130 km) north to south and approximately 800 miles (1290 km) east to west. Surrounded by ocean, the Republic is more than 2,000 miles (3,230 km) from the nearest trading centers, Honolulu and Tokyo. Its nearest neighbors are Kiribati to the south and the Federated States of Micronesia to the west.

There are approximately 1,225 islets spread across an area of over 750,000 square miles (1.2 million square km). With a total land area of over 70 square miles (110 square km), a mean height of 7 feet (2 meters) above sea level, and soils that are nutrient poor, the nations agricultural base is limited. The marine resource base, however, is extensive. The combined lagoon area totals 4,037 square miles (6,511 square km). Coral reefs fringe the atolls and serve as the only defense against the ocean surge. The clearance of the reef in the sections that are covered by water is usually no more than a couple of feet.¹

Generally speaking, an atoll consists of a series of low lying islets and submerged reefs arranged about a central lagoon, which mixes with the open ocean via one or more channels and/or shallow passes. In the Marshall Islands, the islets composing an atoll usually form an oval shape around a central lagoon of 150 feet (45 m) average depth. The surrounding ocean depth plunges to over 5,000 feet (1,525 m) within two miles (3 km), and to 10,000 feet (3,050 m) within ten miles (16 km) of the typical atoll.²

Dye³ suggests a probable development history for the Marshall Islands; he states that approximately 70 million years ago the volcanic cores of the Marshall Island atolls erupted forming new volcanic islands. The islands, slowly subsiding but standing above sea level, were colonized by species of reef-building corals, and the process of reef flat construction began approximately 40 million years ago.

¹ Permanent Mission of the Republic of the Marshall Islands to the United Nations, 1992.

² Fosberg 1990; Wiens 1962.

³ Dye, 1987.

Underwater ocean maps show that there is also an abundance of underwater seamounts, some of which reach almost to the surface, such as Keats Bank east of Mili Atoll. Most of these guyots are aligned along the same axes as the Ralik and Ratak Chains, so that these underwater features as a whole have recently been termed Ralik and Ratak Ridge.⁴

All atolls and islands in the Marshall Islands have *joorāne*, land signs, as well as *joormeto*, sea signs, which indicate a location on an island or on the ocean, as well as the relationship between the land signs or the land itself and the sea sign. Erdland⁵ describes this Marshallese marker system:

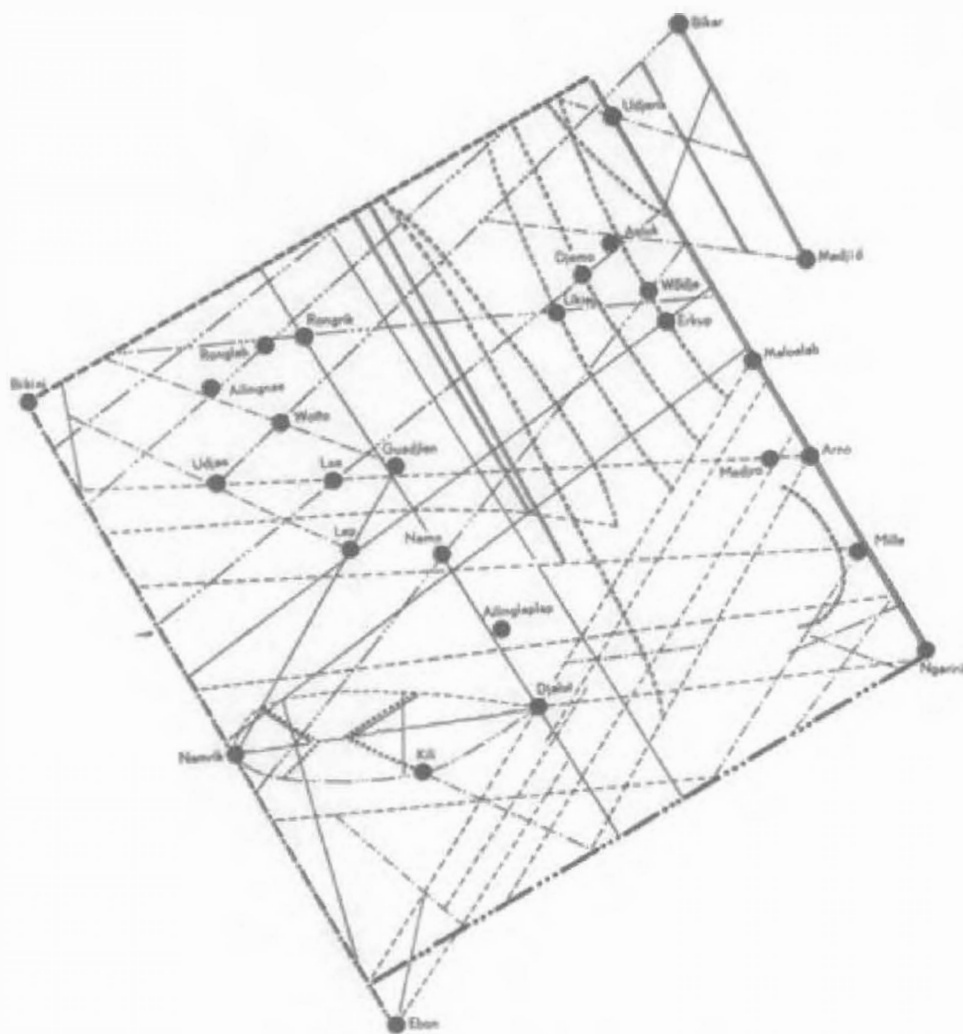
The configuration of these beings, which are on their respective atolls either lifeless objects, birds or fish, which I am going to present might look at first sight as a simple list. Of course some of the names might be without meaning now, because the history of the respective person does no longer live in the memory of the seafarers. Though many of them allow us a deep glimpse into the beliefs of the Marshall islanders and further on they represent a part of the unwritten history of the islanders. Because these names have a special value for the localization of myths and fairy tales. Some of them are mentioned in the legends therefore they can be considered historic to a certain degree. ... It is remarkable that some of these *äkejab* localized on land have children on sea, ... These children of the *äkejab* are birds or fish or other lifeless drifting objects which stay at a certain distance to the atolls

Due to the persistence of these signs they served the old navigators as points of orientation, so that they knew – besides the waves, and other indicators – were the atoll was located to which the respective bird or fish belongs. In order to imprint these sea signs into the memory of the young navigators, the old ones have composed sayings or rhymes, which show a close connection between the sea sign and the land.

Long before the atolls of the Marshall Islands have been discovered and charted by European and American ships, Marshallese had already put their archipelago, atolls and waterways 'on the map' indicating them in Marshallese stick charts.

⁴ Spennemann, 1993.

⁵ Erdland, 1914:346-347; see also p. 30, 83.



Map 2. *Meto*, Stick chart of the Marshall Islands.

...., sea charts are made of straight and curved small mid ribs of palm fronds. Small white sea shells (Cypraea or Melampus) indicate the islands. The maps do not indicate the exact geographical position of the islands but give information about the condition of the sea between the islands, in particular the condition of the surf besides of other matters of significance for the course. There is no regulated system for the sea charts and one school does not know the teachings of the other. Thus a sea chart can only be interpreted correctly by its maker ⁶

⁶ Krämer und Nevermann, 1938:221.

2.2. Climate.

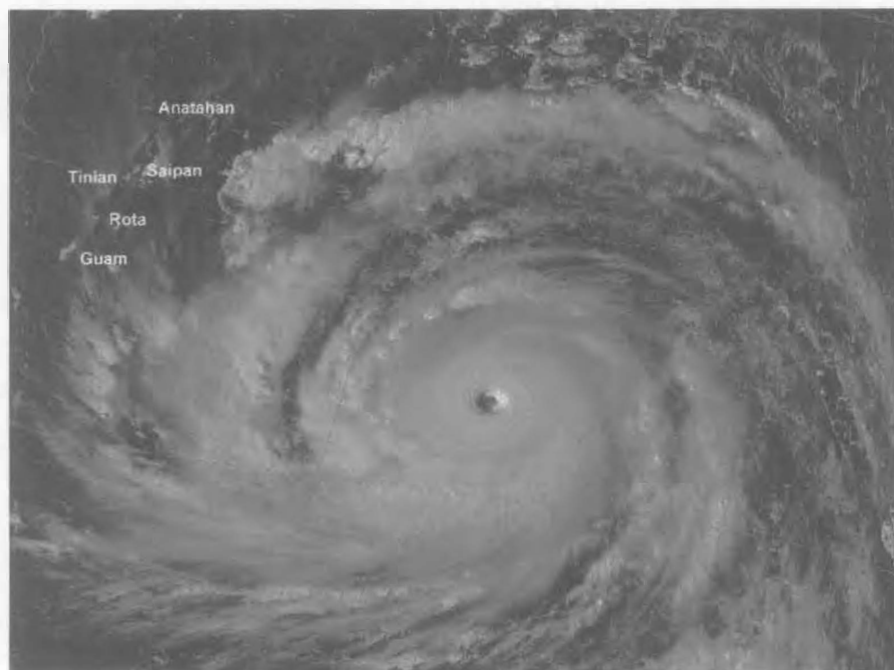


Fig. 9. Typhoon Paka, 1997.

The climate of the Marshall Islands is predominantly a tradewind climate with the tradewinds prevailing throughout the year. Minor storms of the easterly wave type are quite common from March to April and October to November. The islands are not generally considered to be in the Typhoon belt, but because they are low with small land masses they are easily subject to flooding during storms. Tropical storms are rare but do occur. The first typhoon recorded for the Marshall Islands happened in the 1840s. It devastated Likiep Atoll and cost the lives of the greatest part of the population. Then the German administration had been caught unprepared as they had considered themselves outside of the typhoon belt.

The only atoll for which complete weather data exists is Majuro, where the U.S. National Oceanic and Atmospheric weather station is located. Annual rainfall varies considerably from north to south; the southern atolls receiving 120-170 inches (300-400 cm), and the northern atolls receiving 40-70 inches (100-175 cm).⁷ The highest rainfall generally occurs during the *añōn rak* season, also known as breadfruit season (June to October). Precipitation is generally of the shower type; however continuous rain is not

⁷ NOAA, 1989.

uncommon. During the *añōn ean* season, also known as the pandanus season (January to March), the rainfall decreases with February noted to be the driest month of the year.

One of the outstanding features of the climate is the extremely consistent temperature regime. Daily temperatures for both northern and southern atolls fluctuate between the high seventies and mid eighties with no seasonal variation. The range between the coolest and the warmest months averages less than one degree Fahrenheit. Nighttime temperatures are generally 2-4 degrees warmer than the average daily minimum temperatures, which usually occur during heavy showers in the daytime.

In spite of this the weather is always hot and humid with an average temperature of 81° degrees Fahrenheit all year round.⁸

2.3. Vegetation.



Fig. 10. Beach and lagoon Wotho Atoll.

There is no record of the original vegetation of the Marshall Islands. The precise date when plants first occurred in the Marshall Island atolls is still debated.⁹ It is possible that 44 species of plants, including various herbaceous species, seeds of shrubs, and trees

⁸ Permanent Mission of the Republic of the Marshall Islands to the United Nations, 1992.

⁹ Dye, 1987.

drifted to the southern Marshalls before the arrival of man.¹⁰ The early inhabitants probably altered the vegetation of the atolls by introducing new species. During the twentieth century coconut plantations, developed by German, Japanese and American administrations replaced most of the original vegetation of many atolls.¹¹ Today as much as 60 per cent of the nation's land area is covered with coconut (*Cocos nucifera*).¹²

Many areas not dedicated to coconut plantations have been put to other uses such as cultivation of taro and other plants. Species that have been introduced are reliant on the presence of humans for propagation.¹³ The vegetation that grows in the Marshall Islands include mixed broadleaf forest composed of a small number of tree species (*Tournefortia argentea*, *Guettarda speciosa*, *Pisonia grandis*, *Pandanus tectorius*, *Allophylus timoriensis*, *Cordia subcordata*, *Hernandia sonora*); a few shrubs (*Scaevola sericea*, *Suruana maritima*, *Pemphis acidula*, *Tournefortia*); and a layer of ground cover consisting of several species (*Lepturus repens*, *Thuarea involuta*, *Fimbristylis cymosa*, *Polypodium scolopendria*). Several mono specific forests occur in the Marshall Islands (*Neisosperma*, *Pisonia grandis*, *Turnefortia argentea*).¹⁴ Shrubs such as *Pemphis acidula*, *Suriana maritima*, and *Scaevola sericea* typically grow along shorelines while herbaceous plants occur mainly under forests. Limited strands of mangroves (*Bruguiera*) occur on larger islands of the wet southern atolls¹⁵ and are found in swampy areas containing brackish. Several of the cultivated plants (*Musa*, *Cocos nucifera*, *Artocarpus altilis*, *Cyrtosperma chamissonis*, *Pandanus tectorius*) are commonly found on the inhabited islets of the Marshalls. These various plants serve as windbreakers, salt spray repellents, food, and are used by Marshallese for plaiting and medicinal purposes.

On most of the islets there is a strip of natural shrub forest along the seaward coast that serves as a windbreak. This mainly consists of mixed broad leaf forest and shrub with *Scaevola* on its outer edge.¹⁶

¹⁰ Hatheway, 1953.

¹¹ Fosberg, 1990.

¹² OPS, 1991.

¹³ Fosberg, 1990.

¹⁴ Fosberg, 1990.

¹⁵ Stemmerman, 1981.

¹⁶ Fosberg 1990.

2.4. Sea Level Changes.

Due to being so low in elevation, the recent sea level rise caused by global warming or "greenhouse effect" is a critical threat to the Marshall Islands. The rising of the sea during the last two decades has devastated the low-lying atolls economically and culturally. It is estimated that the normal trend for sea level rise has been approximately 1.3 inch to 3 inches increase over the span of 100 years. However, it is figured that within the next 50 years there will be a 1.7 inch increase alone. As predicted by scientists (global warming red alert), the islands of the Marshall's are among the Pacific nations that will be affected by the rising of the sea level within the next fifteen to twenty years. Under normal conditions, coral and the other components of the coral reef can maintain a healthy landmass. At present, visibly eroded scrublands are along the coastline and most of the vegetation growing in this area will soon be washed away by the incoming tides. Any archaeological sites that are located within this area will vanish and their significant historical value will be lost to the tides.

For many years the Marshall Islands Government has been concerned with the issue of global change. As the Marshall Islands lie in open ocean and are very close to sea level, the vulnerability to waves and storm surges is, at the best of times, precarious. Although the islands, have by no means been completely free from weather extremes, they are more frequently referred to in folklore as '*jolet jen Anij*' (gift from God), the sense that the Marshall islands are a god given sanctuary, away from the harshness of the other areas, is therefore a notion that is part of the sociocultural identity of the people. When any variation of the weather hits the Marshall Islands, the effects can be severe. When typhoon Roy passed over Lib in late 1988, the islands and its people were hard hit and outside food had to be brought in. The El Niño induced drought, in 1998, brought consequences that caused the entire Marshall Islands to be declared disaster areas, and emergency water making equipment and food supplies were shipped in from outside.

Given the physics of wave formation and the increasing frequency and severity of storms, the Marshall Islands will likely be at even greater risk of total inundation. The relative safety that the islands have historically provided is now in jeopardy. The impacts are not limited to the Marshalls and its immediate neighbors. The Marshall islands are often referred to as the "front line state" with regard to the climate change issues. It is important to realize that once the potentially catastrophic effects begin to appear, it is likely too late to prevent further warming that will threaten virtually all of the world's coastal regions.¹⁷

¹⁷ Permanent Mission of the Republic of the Marshall Islands to the United Nations.

III. Society.



Fig. 11. Marshallese, ca. 1815.



Fig. 12. Marshallese, ca. 1815.

Marshallese society is generally matrilineal and composed of a number of matrilineal *jowi*. The most important descent group is the *bwij* lineage. This is a matrilineal system in which all land rights are passed down through the mother's side. Therefore the whole group is descended, mother to daughter, from a common ancestor or *jowi*, clan. There were at least forty-four clans spread over the atolls and though no one remembers how members of a *jowi* were related by blood, members still consider themselves related. The *alap*, the lineage head, usually the eldest male of the senior line of the lineage, is steward of the lineage land holdings.

With slightly less than 70 square miles of land in the entire archipelago and prime settlement areas being extremely limited, land has long been the most highly prized possession in the Marshall islands and control of land is the central theme of Marshallese culture. The basic land division of the Marshall Islands is a *wāto*. is a strip of land that ideally runs from the lagoon to the ocean side of an island. One or more *wāto* are held and administered by a matrilineage line. Title is divided and shared by several levels of the society. In the pre-Christian era, the Marshallese social system distinguished between two major classes: *irooj*, chiefs, and *kajoor*, commoners. The *irooj* hold title over an island or atoll. Among the *irooj* the *iroojlaplap*, paramount chief, were the ones with the most power while the *iroojiddik* of the lesser chiefs, shared the power and many of the privileges, but to a limited degree. Today the term *kajur* is not used so often as the class has been divided into the *alap*, land managers, and the *rijerbal*, workers. The *alap* organizes and directs lineage activities and allots lands for use to different descent lines within the lineage. The *alap* and the *rijerbal*, workers, make up the subjects of the *kajoor*, commoners, and render services to the *Irooj* in exchange for the use of land. The *Irooj* managed the land in a way that not only provided themselves with food but also

provided for the *kajoor* (*alap* and *rijerbal*). The *kajoor* in return cultivated the land, harvested the water surrounding the atoll, and performed *ekkan* (tributes to the *Irooj*). The procedure is a cycle that has been repeating itself for hundreds of years. The common members of a lineage have land rights, although the *alap* and the *rijerbal* change land ownership. The *Iroojlaplap* is the only individual with permanent land rights, unless defeated in war.

Historically one *Iroojlaplap* (paramount chief) was able to extend his control over most of the Ralik Chain (except Enewetak and Ujelang). Periodically the *Irooj* visited these islands to collect tribute. The Ralik Chain was subsequently divided into two districts, one including Namu and the north islands, the other Jabat, Ailinglaplap, and the islands south. Although all of these islands were owned by the *Iroojlaplap* he rarely visited those further north than Kwajalein and Ujae, because they were isolated and somewhat impoverished.¹ Within the northern atolls, stratification was less elaborate, in comparison to those in the south. Ratak was likewise structured but far less centralized. The whole chain was never integrated under a single *Iroojlaplap*, although the *Iroojlaplap* of Maloelap was able to put the islands to the north (except for Mejit) under his rule. Majuro and Arno broke away from this union, however, and again became independent political entities. The Ralik and Maloelap associations were unstable and varied in size as local lesser *irooj* tested the strength of their islands against that of the *Iroojlaplap*. This trend towards instability encouraged the *Iroojlaplap* to move his residence from island to island to make his control evident to the local lesser *irooj*.

Today traditional rights of land tenure are unequivocally preserved in the Constitution, and the traditional requirements of consensus decision making, in which all persons with land rights to a certain *wāto* must agree, on questions of land transfer is retained. The traditional land tenure system confounds Western-style efforts of historic preservation. Public or government land is non-existent and private landowners are accustomed to exercising ultimate control over land use and access, and are therefore incepting of regulations which might restrict the usage of their property.²

¹ Alkire, 1977.

² Williamson, 2001.

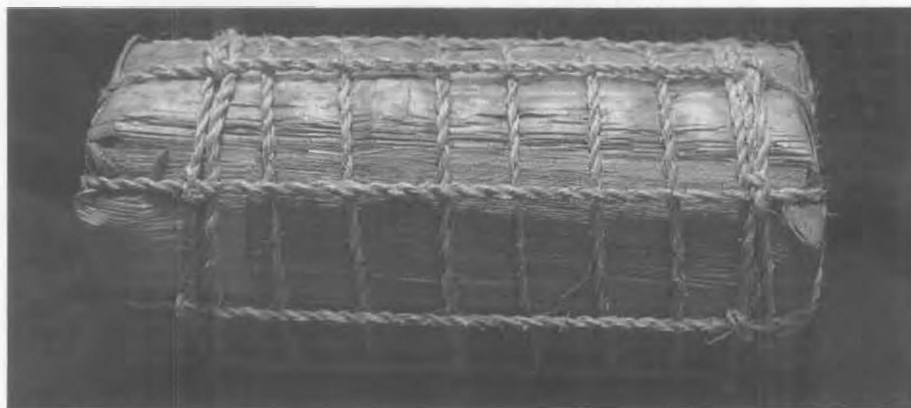


Fig. 14. Pandanus preserve sold at the Robert Reimers Hotel in Majuro, ca. 15 cm.

Krämer describes the process like this.³³

For the preparation *maramuir* of pandanus preserve (*djänogin in bob*) the juice is thickened in the sun over a fire. The preparations are the same as those for obtaining juice in small amounts, but preferably the work is done under a small protecting roof. Then, when preserves are to be prepared in large quantities, one can heat coral slabs in a pit in the ground (*um in kilok*) two to four meters wide with a wood fire, fill the space with alternate layers of pandanus cones and leaves and top it with sand and stones. A tridacna shell can be put in the bottom of the pit for the juice of the cooking fruit. After twelve hours or not until the second day, the oven is opened. After the men have peeled the cones the women use a small stick to scrape the thick juice onto a board (*rebakebak*, Ratak: *jär*) on which they let it dry in the sun. In place of this the grill (*bui*) mentioned by Chamisso is also used for drying. It is long and narrow and built up to two meters above the ground. There are also dryers (*jär*) made out of one or several grills, placed one over the other with leaves, two to four meters high, with a narrow roof. Banana or breadfruit leaves are spread on the grill of sticks and the pandanus juice is dried on it. The open fire under it is fed with wood, palm leaf stalks and pressed out pandanus cones. Chamisso mentions a "gentle fire of coals" under the grill. Then the pandanus mush is brought to a boil once more and finally dried in the sun, being turned several times. The flat pandanus mush cakes (*mogan*), are wrapped around a piece of palm leave, which is later removed, and rolled over on another until the desired size is reached. It varies in length from 20 cm to 3 meters and is 40 centimeters in diameter.

In 1906 Augustin Krämer reported about very thick and long rolls of pandanus preserve.³⁴

Attached plate 15 [Fig. 26] shows such a roll, called *djänogin in bob*. It is carefully wrapped in pandanus leaves and artfully bound in sennit rope. Now if you lack fresh produce, you simply cut some off it, ... This is *mogan* of which Chamisso reports that it is the most cherished possession of the people of the Ratak Chain. Though, there

³³ Krämer und Nevermann 1938:134-135.

³⁴ Krämer, 1906:428.

IV. ORAL TRADITIONS.

Prior to the introduction of a written language, Marshallese culture was an oral society where information was maintained through oral traditions. Elder generations passed down beliefs, values and philosophies by telling stories and chants to the younger generations. Many places in the Marshall Islands, which have special cultural significance, offer a wealth of folklore associated with their pasts. Traditional sites are natural features in this environment to which oral traditions are attached. Each atoll and island has its own history and its stories relating to people, settlements and topographical features.

Mc Arthur¹ states that while islanders can usually recall the names and basic events of the demigod of their atoll, very few can identify the names and stories of those from other atolls with the exception of Loktanur and Jebro for Ailinglaplap, Limejokeded, Jemeliut and Letao of Majuro and the female Lijenenbwe of Namu. Loktanur, Limejokedad, and Lijenenbwe are said to be sisters. Lijenenbwe was the 'mother' of Liwatonmour, who was believed to have remained at Namu, in the form of a basalt rock. Some accounts suggest that she had originally come from the Ratak Chain in the east and that one of her sisters, Lidebdebju, remains as a basalt rock on Aur Atoll. The Ijjidik *jowi* were the first descendants of the Lijenenbwe to emerge as a clan and that later the Erroja *jowi* became dominant. Johnson and Johnson² include a story in their collection that claims that the Ralik and Ratak Chains were peopled from basalt pillars, one for each chain of islands. Liwatonmour, a pillar in Namu, supposedly bore the first Ralik chief and her sister Lidebdebju, on Aur Atoll, the first Ratak chiefs.

There are many variations in the creation accounts. Regardless, the different versions introduce key characters important to Marshallese cosmology. According to Erdland's sources the Ralik version of the creation begins with the a being Lowa (or Loa) who lived on the sea, which was bounded by an extensive, low table reef in the south and a swamp in the north. Lowa spoke to the sea, 'See your island reef' and reef formation appeared. Then he said, 'See your sand', and the earth appeared on the reef. Again he spoke, 'See your plants', and plants were growing. Again he spoke, 'See your birds', and they appeared. One of the birds, white gull, flew up, and while circling, spread out the sky, like a spider weaving its web between two bushes. When Lowa finally said: 'See your human beings', four human beings appeared, one in each direction: Iroiiddrikrik in

¹ Mc Arthur, 1995.

² Johnson and Johnson, 1980.

the west; LoKomraan or Lakameran (Daymaker) in the east; Lorak or Rerik in the south, Lajiminanmen, Lajbuineamuen, or Lalikian in the north.

Then a boil grew on the leg of Lowa, from which, when it bursts open, emerged Wulleb and Limdunanji. Limdunanji gave birth to two male beings: Lanej (Master of the heights) and Lewoj (Master of the Middle of the Island).

One day Wulleb and his sister's children sat on a stalk of arrowroot, which grew up to the vault of the sky and enabled them to ascend. Their peaceful companionship, however, was of short duration. Soon the brothers plotted to kill their uncle, and Wulleb, Lanej and Lewoj waged war in the dome of the sky. After they had observed each other mistrustfully for several nights, Wulleb's retina tore and he fell down from the dome of the sky on Imroj. Thus matrilinearity begins.

When he sighted aloud as the result of this fall, Iroiiddrikrik awoke, came to him and spoke: 'Well this is Wulleb, and he has fallen from the sky!' Wulleb answered, 'My nephews and I we watched one another by night; then when my retina tore, I fell down.' Iroiiddrikrik then spoke, 'Let us go into the hut'. They went in and three months passed.

When Wulleb had spend some time with Iroiiddrikrik, a large and extremely painful boil developed on the extensor of this leg. After it became ripe it broke open; two little boys issued from it, the elder of who was called Jemeliut, and the younger Letao.

Wulleb sent them to Lijebake (Tortoise Woman) on Bikar Island, in order to get magical tortoise shell from her. Lijebake - who with her granddaughter Lijwei, had come from the Gilbert Islands - gave Letao a magical potion, which he drank despite all his disgust. In doing so he became a crafty hero who not only conquered several atolls, but also embittered the life of his brother Jemeliut, that the latter settled on Majuro Atoll, married there, and finally changed into a silver tree. Letao went everywhere seeking adventure and met sudden death in the Gilbert Island.

According to Raymond³ in *Das Weltall*, the Ratak version of creation starts with two serpents (or worms), the male was called Wulleb and the female, Lehman (Woman Rock). They developed into human form in a shell. To make a larger world Wulleb lifted the arch of the shell using a stick to expand it to the present height of the sky and width of the ocean.

³ Raymond, 1899.

From a boil on Wulleb's forehead emerged Lewoj and Lanej, who were sent to the sky by Wulleb in order to put up the stars. Lejman also had two female offspring, Lino (tidal wave) and Ni (coconut).

Then Wulleb collected in a coconut shell the blood from a cut on his leg, and from this blood came Letao (one with the white eyebrow, the powerful, the crafty, the favored one) and Jemelud (father of the rainbow). They went out to conquer. Prior to the conquest of the islands they had already ascended to the vault of heaven in order to defeat their older brothers. That their ascent in the north was successful is clearly shown by the fact that the Northern Hemisphere is less far less inhabited (studded with stars) than the Southern Hemisphere. A bird flew to tell one of the sky gods their plans to defeat their brothers. This god captured Letao's small son, set him impossible tasks, which the son accomplished, finally he lowered himself to earth on a thread. Letao had settled on Mejit. Bikar was formed by a rock that Letao threw at the bird, which had come to spy on him.

Lowa			
	Wulleb	Limdunani	
Jemeliut	Letao	Lanej	Lewoj

Table 2. The cosmological genealogy of the Ralik Chain.

Wulleb Lejman					
Jemeliut	Letao	Lanej	Lewoj	Lino	Ni

Table 3. The cosmological genealogy of the Ratak Chain.

Other accounts add information, though some are quite contradictory. According to Knappe the first being was Wulleb who lived with his wife on the invisible island of Eb. One day a tree grew from Wulleb's head, split his skull, and out came Letao and Jemelut. Letao quarreled with his father and went away flying through the air with a basket of earth, some of which spilled through a hole, so that the islands came into existence in the sea. Then Letao planted the land, created land and sea animals, and married his mother. Then the bird Babuk came with the first female sexual organ in his beak. Letao hid it. Lejman found it and put it on. Neither wore clothes at this time and but Lejman became ashamed and took two mats as covering (beginning of clothing).

From their union came the first people. In this version it is Letao who is credited with the creation of animals and plants. According to Knappe, the woman was not ashamed because of her nakedness, but because she had an incestuous relationship with her son.

In other writings, there are claims that it was Iroijrikrik who married the woman Lijebake of Bikar.⁴ Erdland⁵ tells of a story in which Jemeliut has an aunt Limejokeded. After stealing bananas and being caught by her Jemeliut become an ogress and gives birth to mosquitoes, flies, mudfish and the warrior Toltoliben.

Davenport's version states that Lowa sent a man who put all the islands in a basket and arranged them, first the Carolines, then the two chains of the Marshalls, Namorik was dropped out of order. The basket was eventually thrown down too, and became Kili.

In several versions, Lowa sent two men to tattoo (on Ailinglaplap) all the living creatures, thus giving them colors and markings.⁶ Lowa sent two men down to Bikini with measurements for the first canoe.⁷ A woman bore a son and a coconut. At his request she buried the coconut, which grew into the first coconut tree. Again at his request she husked a coconut and the husks floated to Iroijirilik, who made sennit with them. The sennit was taken by a bird. It flew into the air with the rope, thus making a net and widening and raising the sky, as well as holding it up. Rain is water separated into drops falling through this net.⁸ Everyone went to Namu to honor Liwatonmour, the founder of the Irooj clan. From this gathering came all clans, with Irooj as the highest.⁹

Before the arrival of the Missionaries a myriad of supernatural beings inhabited the Marshall Islands. Each of them could be named individually and was outfitted with special characteristics, life circumstances, and associated stories. Today this pantheon of the netherworld is usually subsumed under the name of *timon*. Traditionally medicine was closely related with the spiritual world of the Marshallese. Spirits could cause sickness and could also help in the healing process. In dreams they would reveal cures to healers and would guide the healing process when asked by *bubu*, divination.

⁴ Krämer und Nevermann, 1938.

⁵ Erdland, 1914:

⁶ Davenport 1953, Chambers 1969, Buckingham 1949.

⁷ Buckingham 1949, Davenport 1953.

⁸ Krämer und Nevermann, 1938; Chambers 1969; Buckingham 1949.

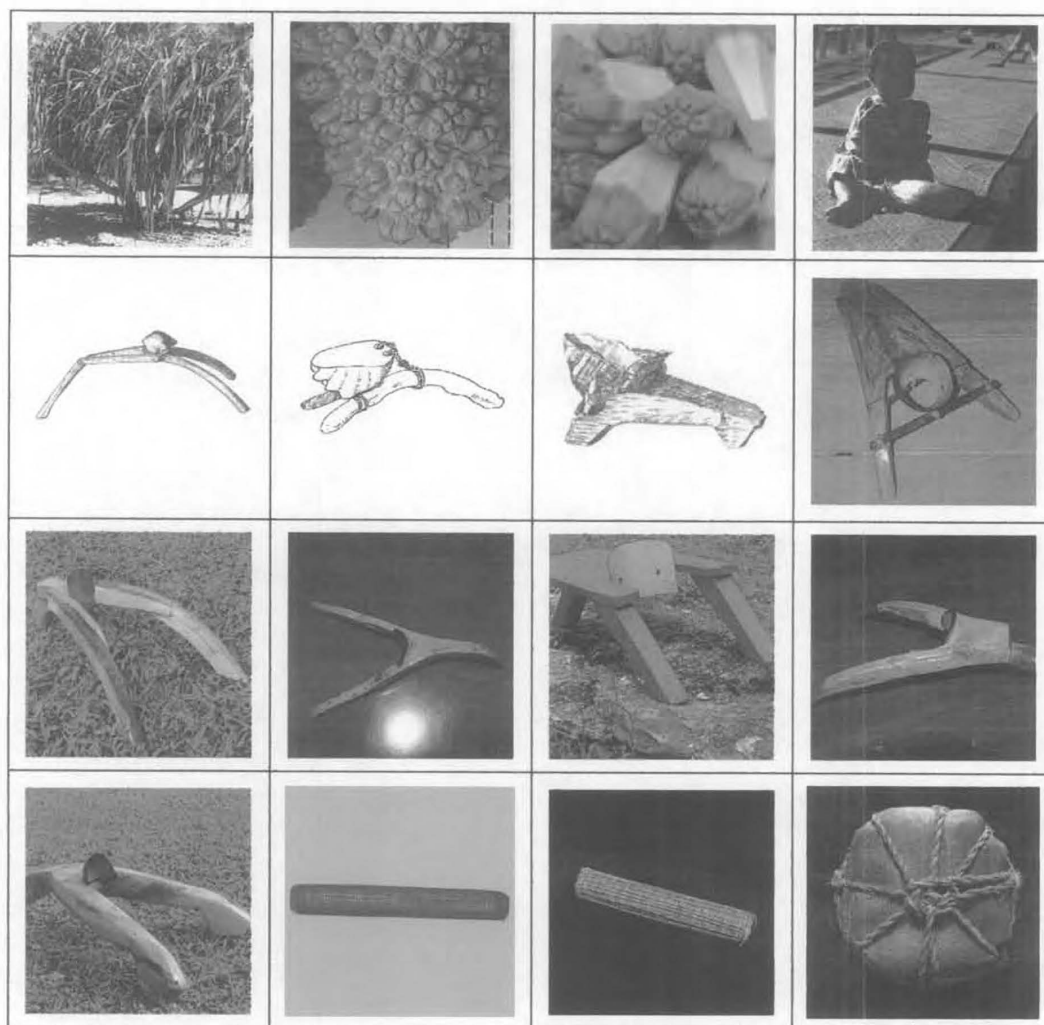
⁹ Chambers 1969.

4.1. *Kajin Majel* - Marshallese Language.

All people of the Marshall Islands speak *kajin majel*, Marshallese. In former times there were two distinctive dialects, the Ratak Chain dialect and the Ralik Chain dialect. Due to the urban centers Majuro and Ebeye in the Ratak Chain, today these two dialects are merging with the Ratak dialect having more speakers and seeping into Ralik speaking communities. The English language is another strongly felt influence. English as a second language is taught in elementary school, as well as in High School and education in the Marshall Islands College is entirely in English. Many Marshallese attend school in the United States or live abroad for some time. The effect of this exposure is that English is more and more a necessity for many people and the Marshallese language has many English loanwords.

There is no accepted orthography for the Marshallese, consequently a considerable variation of spellings for one word can be found in the literature. The spelling employed in this report tries to follow the Marshallese-English Dictionary. Names and place names are written according to the local Government. In general, this text represents the Marshallese language in *italics* (except in cases of place names or proper names) and presents the English translation or equivalent after the Marshallese.

V. *Beka* or *Weikan*, Pandanus Crusher.



5. 1. Background Research.

A) Beginning of *Bōb*, Pandanus, in the Atolls of the Marshall Islands.



Fig. 1. *Bōb* pandanus tree.

The woman of the Pandanus tree, Lukjānmeto, was standing in the sea now. The woman was looking after pandanus. The pandanus tree stood in the sea. Now all of the kinds of pandanus (fruit) were on the pandanus tree, [on] the branches of the pandanus tree. One branch Annānu, one branch Joibeeb, one branch Uōttōt, one branch Lipjinmede, one branch Anperia, one branch Julele, one branch Kurajak, one branch Eki, one branch Eḏmaʼmo, one branch Alorkwōm. One branch Tōbotin, one branch Jolio, one branch Jomwin-jokur, one branch Rupijin, one branch Bōbijak, one branch Lopiṇpiṇ, one branch Jomwinjōn, one branch Joilokwaar. The pandanus tree was big and there were many kinds of pandanus [fruit] on the branches there. There was Mōjeel (pandanus) and there was Aujoṇ. It was besides the pass of Aelōṇlaplap, atoll of Ralik [the western chain of the Marshall Islands]. The name of the woman of pandanus, Lujānmeto. ¹

Indeed the first *bob* tree is said to have grown on Madmad Island, Namdik. The first *bob* tree is said to have grown on Madmad Island, Namdik.²

According to another story Lejorimo, a man from Lib Island, went to all the atolls of the Marshall Islands and left different *bōb* - pandanus varieties there. This story is connected with Tibab *wāto* on Lib and, therefore the most common *bōb* in Lib is Tibotin.

¹ Tobin, 2002:87; as told by Lamān, Majuro 1957.

² Merlin, 1994:34.

B) Bōb — Pandanus, Screwpine, *Pandanus tectorius*.



Fig. 2. *Edwan*. *Pandanus tectorius*, inedible variety.

Pandanus is not everywhere a cherished food item,

... in most of pandanus' range, from Madagascar to Polynesia, people do not bother with pandanus fruit and justifiably so.



Fig. 3. Fruit of *Edwan*, *Pandanus tectorius*, inedible variety.

However on atolls such as those of the Marshall Islands where soil does not produce easier foodstuffs, there was reason to figure out how to utilize pandanus fruit. Hence hundreds of years ago, long before recorded history the early inhabitants of these islands not only learned to eat pandanus but perfected its cultivation and storage.

Some individual pandanus were found to have keys surrounded by tender pulp, but if allowed to sprout from seed the offspring reverted to as rock hard variety. So back in prehistoric times ways were developed to clone desirable trees. The ancients became proficient horticulturists in their pandanus propagation.³

³ The National Biodiversity Report of the Republic of the Marshall Islands, 2000:20.

Although this species maybe indigenous in the Marshall Islands, early Marshallese probably brought some important cultivated varieties of this very useful plant with them.



Fig. 4. *Lōjokdād*, edible pandanus fruit.

There are several ways to distinguish between varieties of bob. The size and shapes of the fruits and leaves, where the plant is located, and its overall size are some of its characteristics that people use to recognize a particular variety. ...⁶

Chamisso noted twenty different *bōb* varieties, Erdland fifty, but there are probably more.⁷ The Marshallese name of the plant is often an indicator of its characteristic.

Bōb irooj is an interesting variety because it ripens before all other varieties, and takes its name from the paramount chief in that both come before all others.

Bōb is a wide branched tree that grows up to heights about 25 feet (25 m). The trunk has aerial prop roots and long leaves up to 10 feet (3 m) ... The large edible fruit is an aggregate of many angular wedge-shaped sections or 'keys' that turn orange as they mature. This very important wild growing and cultivated tree ... is also sometimes referred to as the 'screwpine' Over countless generations of cultivation, selection of preferred tree types for propagation has produced many varieties of *bob*, including those with extremely large fruits.⁴

All fruits taste different, some like carrot, some more like citrus fruits or mangoes.

... the sweetest pandanus fruits such as *bugien* and others were reserved for the chiefs.⁵

⁴ Merlin, 1994:34.

⁵ Krämer und Nevermann, 1938:141.

⁶ Merlin, 1994:36.

⁷ Erdland, 1914, 39.

... *Loarmwe* is named for the trees with which it is found, *lq* meaning at and *armwe* Pipturus.⁸

Since time immemorial the inhabitants of the Marshall Islands have used pandanus as one of their staple foods. The fact that it could be preserved made it even more important, because it would last well into times of need and could be taken on board for long canoe journeys as sea ration. Equally important is its easy availability as it can be eaten raw as a juicy snack. Thus in the past as well as in recent time it is considered an important food crop.⁹



Fig. 5. *Bōb*, Pandanus sold at Payless in Majuro.

Besides food pandanus is used for weaving sleeping mats, baskets, clothing such as hats (in former time also clothing mats as well as different sorts of belts). The leaves of pandanus serve well as thatch and in the past were also used to make sails for outrigger canoes. Pandanus is frequently mentioned in the pharmacopoeia of traditional Marshallese medicine, too. Considering the importance of this plant it is no wonder that pandanus is reproduced by planting cuttings (asexual reproduction). There are over 100 named varieties of pandanus in the Marshall Islands. Some of these may now be

⁸ Merlin, 1994:37.

⁹ In old Marshallese language, still used in Bible texts, *drao* means blood. But in connection with food it means my food pandanus. It is only used in relevance to pandanus and cannot be employed in association with any of the other staple foods.

extinct.¹⁰ In this report we will only consider the food aspects of pandanus in order to explain why a pandanus scraper was and still is a vital tool in Marshallese households. Chamisso describes how vitally important this food has been in the past.

The wild pandanus seems to be common property. A bundle of leaves from this tree (a symbol of possession) tied to the branch on which a fruit is ripening assures the one who discovered it the right to it. We have often seen this fruit, almost the only food of the Radakians being consumed when it was still far from being ripe.¹¹

In general they [the Marshallese] have their teeth spoiled, the front ones often broken off, by the nature of their basic foodstuff, from chewing the fruits of the pandanus with its wooden fibers. This is less the case with the chiefs, for whom the juice of the fruit is scratched out and extracted with the edge of a shell.¹²



Fig. 6. *Utōtōt*, pandanus keys ready to eat.

In order to sustain people for a long period of time pandanus needs to be ... a valuable source of vitamin-A. It also has small amounts of thiamine, riboflavin and vitamin-C. Some varieties are eaten raw, some cooked, and others may be consumed in either state. ... A study on Majuro forty years ago indicated that some people ate as many as 25 pandanus keys a day, and that some pandanus, fruit in one form or another, was eaten 293 days out of the year. Pandanus is far less available in the urban centers now. Recently on Ebeye a large fruit of *bob* cost 12 USD in a grocery store. ...

¹⁰ Merlin, 1997:34, 36.

¹¹ Chamisso, 1986 [1836]:276.

¹² Chamisso, 1986 [1836]:275.

Besides being served as food, the fibrous fruit of pandanus helps clean the teeth, acting as a natural dental floss.¹³

In 1914 Erdland, a German priest stationed on Jaluit, reports that fresh pandanus juice is a good nurture for the sick.¹⁴ In 1906, the German Ethnographer Augustin Krämer describes pandanus like this:

During their [the Marshallese] sea journeys, the question of provision is of vital importance. People on the Ratak and Ralik chain luckily solved it by inventing a few food conservation processes. Here pandanus holds the pole position, ... The tree has fruit keys of 1-2 feet length. Numerous beans are attached to its fruit-base. Just like on the fruit-base of maize, the ripe beans are broken off and can be sucked for its juice. When they are raw the taste is very pleasing and sweet. Everywhere you can see the local men and women, girls and children enjoying the sweet fruits, though the elderly can only do so, when they have not lost yet their front teeth from the constant chewing of this fruit full of fibers, ... For them the fruits are boiled, and the juice is then squeezed out over the sharp edge of a shell, which has been attached to 'tripod', the so-called *wegang*. This juice is now used for the production of the pandanus preserve, which is produced in huge amounts by entire villages. The juice is poured into big but thin cakes and thus dried under the sun. These cakes are rolled just like pancakes, one layer after the other until the desired width and length of such a roll is achieved.¹⁵

Some pandanus varieties such as *lōjokdād* are best suited for making *mokwan*, pandanus paste and *jankuun*, preserved pandanus, and it is best to use them just before they are ripe. The first fruits ripen in October though the main season is in November, December and January. Some fruits even continue to ripen well past this season. Winter, therefore, is time for hard work in the Marshall Islands because this is the period when pandanus fruits are harvested and processed. This time is called *anenean*.¹⁶

C) *Beka* or *Weikan*, the Pandanus Crusher.

In the Ralik Chain the tool is called *weikan*, in the Ratak Chain it is called *beka*. It is used to crush pandanus keys and squeeze their juice out. This is a man's work and the tool is also considered a man's possession.

The pandanus crusher consists of a sort of flat tripod, which actually could be compared to a curved fork. It is made from the wood of *mā*, the breadfruit tree, *utilomar*, *Guettarda speciosa*, *kōñe* *Pemphis acidula*, or *lukwej*, *Callophyllum inophyllum*. From the front legs to the one in the back it measures 30 - 45 cm. Occasionally a tool with four

¹³ Merlin, 1994:34-35.

¹⁴ Erdland, 1914:39.

¹⁵ Krämer, 1906:427-428.

¹⁶ Interview with Raynard Kabot Feb. 9, 2004.

legs, or one made of a footless slab can be found. On its top there is sometimes a flat space, of which the edges can be slightly heightened (as in fig. 7).¹⁷



Fig. 7. Pandanus crusher, ca. 1900, Maloelap Atoll,
Ratak Chain



Fig. 8. Pandanus Crusher, ca. 1900, Lae Atoll,
Ralik Chain

On top of it, or in-between the front legs, or on some holes in this location, the shell of a *bukbuk*, *Cassis cornuta*, is inserted and attached, before one of its sides has been filed off. In 1887 Finsch wrote:

A very interesting crater is called *dschibugebuge* (=barrel) and is made of *Cassis cornuta* (Wuëgang). ... I was able to obtain two of them on Jaluit, where they are already considered part of the past, but on the northern atolls they still might be in use.¹⁸

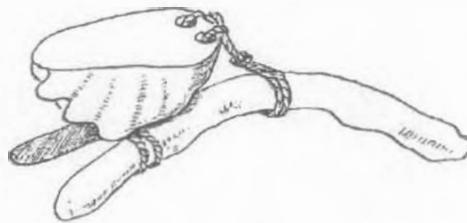


Fig. 9. Pandanus crusher from Jaluit Atoll, 1887.

Instead of a *bukbuk* shell half a coconut shell or only a ring of a coconut shell can be attached. The fleshy part of the fruit is wiped off against the sharp edge of the *bukbuk* shell or coconut shell container, so that the sap is collected in the shell container. In recent time a piece of metal is inserted into a groove of the tripod and the sap is allowed to run down where it is collected in a vessel underneath the pandanus scraper.¹⁹

¹⁷ Krämer+Nevermann, 1938:129-130, Krämer, 1905:142, Merlin, 1997:56.

¹⁸ Finsch, 1887:150.

¹⁹ Krämer+Nevermann, 1938:129-130.

Krämer describes the procedure like this:

Another method is to cook the pandanus beans in an uncovered hearth to soften them; then the juice is scraped out (*kilok bōb*). A special tool (*wegang*) is used with a Cassis shell. The scraping is usually done with one hand. Only when one is in a great hurry, for example when making preserves, does he scrape the Gilbertese way (*kilok in bit*) with both hands. The pandanus beans are scraped on the sharp edge of the Cassis container, so that the juice (*kalaomuremur*) collects inside. When making preserves however, it is allowed to run into a pit lined with pandanus leaf mats (*kono*).²⁰

"A pandanus crusher belongs to the man in the family," says Raynard Kabot, the informant during this research, "the man is the one who makes the tool and uses it, thereby, producing *mokwan*." This is still true, even today when women can also use a pandanus crusher. One day the son of Raynard Kabot will inherit his father's pandanus crusher. Referring to Jaluit, his home atoll, he says that every family still has a pandanus crusher in their house. It is hung on the wall in order to keep it out of the way and indoors. In order to hang it a string is attached to its one hind leg.²¹

D) *mokwan* or *jāānkuun*, Pandanus Preserve.

During this research it was not possible to establish the difference between *mokwan* and *jāānkuun*. According to some sources and informants *mokwan* is the juice from cooked pandanus keys, whereas *jāānkuun* is the preserved pandanus paste. According to others, though, *jāānkuun* is the expression for dried pandanus paste in the Ralik Chain whereas *mokwan* is the name for preserved pandanus paste in the Ratak Chain.

As indicated above pandanus is an important staple in the diet of the people of the Marshall Islands. A lot of pandanus is consumed by chewing the raw keys and sucking its juice, while softening the fruit by repeatedly biting it. For old people with lack of teeth or weak teeth this is impossible.

The pandanus keys are often cooked for the old and beaten with a three edged stone *bjugor*. This is called *kabibie*, or the juice is scraped (*killok*) out for them. ... This juice is called *kalaomuremur*. This is also prepared in great quantities and used in the preparation of other food.²²

²⁰ Krämer, 1905:142.

²¹ Interview with Kabot on Feb. 9th 2004.

²² Krämer, 1905:142.

Raw pandanus keys are also crushed to extract fresh pandanus juice. Before crushing them on the pandanus crusher the keys are beaten with a *kapipe* stick, in order to soften them. Such a stick is usually made of hard wood such as *kōñe*.²³



Fig. 10. *Kapipe*, pandanus-key-beater made of *kōñe*, Pemphis scidula; 29 cm long and 5 cm thick.

In 1817, Adelbert von Chamisso, one of the first foreigners who described life on the Marshall Islands, experienced the following on Maloelap Atoll.

She received the distinguished guest and his gifts in silence and in exchange ordered two rolls of *mogan* and coconuts to be handed to him. *Mogan*, the most valuable thing that a *Radakian* can give, cannot be purchased, even for iron. ...

Mr. von Kotzebue [the Captain of the ship] gave Tigidien weapons! Lances and grappling hooks! Tigidien had brought him a present of several rolls of *mogan*. The circumstances and the impending war may have contributed to the high value that was placed upon the *mogan* and to the difficulty we had in acquiring any. This delicious sweet confection is the only food stuff that can be shipped for longer trips. It is the sea biscuit of these seafarers.²⁴

According to Senfft thin pandanus juice is called *källomurmur*, whereas the thick one, which is used for the preparation of the pandanus preserve is called *moggan*.²⁵ To squeeze the juice out is called *killok*.²⁶ Raynard Kabot describes the process of making pandanus preserve like this:

The population of the entire village participates in this venture. ... A big hole (about 10 feet long, 4—5 feet deep as well as wide) is dug and lined with coral slabs. A lively fire in the hole heats the slabs like an oven. In the meantime the heavy bob fruits have been collected and divided ... into its individual keys. They are placed into the heated hole alternating one layer of fruits on a layer of leaves. When the hole is nearly full, a last layer of leaves is placed on it, then hot sand and coral stones are put on top.

²³ Interview with Josepha Maddison Hill, June 21, 2004, Majuro.

²⁴ von Chamisso, 1986:148.

²⁵ Senfft, 1903:451.

²⁶ Interview with Kabot 9th Feb. 2004.

This is left for two days to cool down. The heat softens the yellowish glutinous syrup, which is extracted by crushing and crating. Girls and children carry the keys in baskets to the men who are kneeling in front of wooden frames, crushing and crating with knives or coral stones. While doing this everybody sings monotonous chants. Then the juice is dried under the sun on wooden devices, in form of flat cakes, which are finally pressed into long thin rolls. They are covered with pandanus leaves and carefully wrapped with sennit.

Father Wendler, a German priest, stationed in the Marshall Islands, described the making of pandanus paste, *mokwan*, on Utrik Atoll in 1908.

Bōb keys were partly crushed with a large stone. They were then cooked in the earth oven for about twelve hours. Girls and children removed the keys and took them to men who scraped (*kilok*) them on a pandanus leaf mat (*waikañ* or *peka*). The resulting honey like mass was spread on a wooden drier (*jād*). The dried cake was taken from the drier and cooked and dried again. It was then wrapped in pandanus leaf and tied with coconut sennit cord. The final package was portable and so well preserved and protected that it was safe from insect pests and could last for years. Chiefs often used these packages for gifts. *Mokwan* could be eaten in cut sections or could be made into a soup (*jinnōb*) the entire process was accompanied by repetitive singing and general merriment. *Mokwan* is the earlier stage of *jāñkun*. *Jāñkun* is the final product, wrapped in pandanus leaves and tied with a coconut sennit cord.²⁷

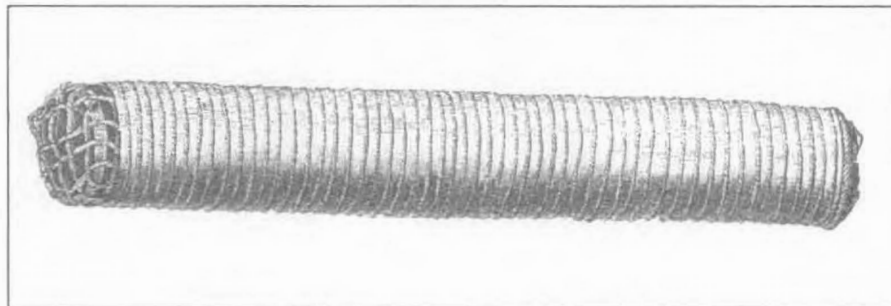


Fig. 11. Roll of preserved pandanus recorded in 1887.

In order to facilitate the process of making pandanus juice, and also in order to preserve its original taste, the pandanus cones are softened by beating them and then the juice is squeezed out by pressing them against some iron. Old people who lack their teeth and cannot consume the entire cones anymore prepare the pandanus fruits in an earth oven, thus softening the entire cones. Only then the juice is squeezed out with the help of a pandanus scraper.²⁸

²⁷ In Merlin, 1997:36.

²⁸ Erdland 1914:39-40.

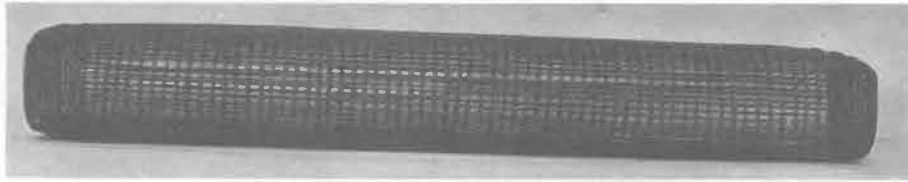


Fig. 12. Roll of pandanus preserve, German time.

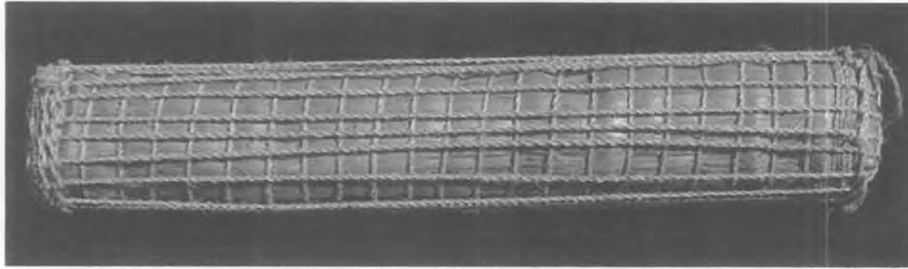


Fig. 13. Roll of pandanus preserve, Alele Museum (37 cm, long and 7 cm wide).

Kurze also describes the process of making pandanus preserve (*dschengue* as he calls it). The pandanus fruits are placed in big heated holes, which were lined with leaves. These oven pits were covered with sand and a fire was burning on top of them for two days. Then the softened fruits' juice was squeezed out on semicircle knives. Men, accompanied by chants, do this work and they produce a thick and golden colored juice.²⁹ The liquid is poured on a device called *jer*, made from the hard roots of the pandanus tree. The roots are cut in small sticks, which are placed tightly together forming a table like structure, the *jer*. On top of the *jer* some leaves are placed to prevent the *mokwan* from 'running away'. When the *mokwan* is syrupy it has a dark yellow color, when it is dry it is brown.³⁰

Mokwan is dried under the sun and finally pressed into one foot thick rolls, which Kurze calls *jenkon*. According to him it tastes similar to figs and can last up to two years.³¹ About five pandanus fruits are needed to produce one small sized roll of pandanus preserve.³² The wrapped roll should be stored in a cool place.

²⁹ Kurze, 1887:79.

³⁰ Interview with Kabot Feb. 9, 2004.

³¹ Kurze, 1887:79.

³² Interview with Raynard Kabot, Feb. 9, 2004., Majuro.

are also rolls of much smaller size (only one foot in length) produced and these are much easier to obtain.

In former times it was a village enterprise to produce such big rolls, as depicted in Fig. 26.³⁵ They were only made for the chiefs. These chiefly rolls of *mokwan* had to be kept safe until the chief came to the atoll to pick them up. In order to safeguard and preserve them they were placed into the lagoon under big coral boulders. Before putting them into their liquid safe keeping a magic spell was placed on them. Storing *mokwan* in such a watery environment made it very hard. When the *mokwan* was tightly packed and fastened, it was water tight, and would stay dry in its watery storage - the 'Marshallese refrigerator'. A roll could stay in there several months.³⁶



Fig. 15. Benak, Kabua's daughter, sitting on a big *mokwan* - roll of pandanus preserve.

The informant Raynard Kabot had never seen this 'refrigeration-procedure' himself, but had repeatedly heard about it on Jaluit, his home atoll. On the other hand Krämer reports:

The rolls are packed in pandanus leaf strips (*mang*) and wound spirally with coconut fiber cord, over which cords run lengthwise and are twisted at both ends. Thus the preserves are protected against ants, water and other influences.

³⁵ Jeschke, 1906:273, reports rolls of three to four hundred kilograms (663 to 884 pounds).

³⁶ Interview with Kabot Feb. 9, 2004.

When the question is posed how long such a preserve can last and still be consumed, we have no precise information. Some people who were interviewed believed that a preserve like the ones kept in European ethnographical Museums, which were



Fig. 16. Pandanus preserve.

collected during the German colonial times (1886 - 1914), could still be consumed today without imminent health danger. Krämer, who was a medical doctor, considered one year old preserves safe for consumption.³⁷

Today *mokwan* is still very popular. During this research informants often referred to it as Marshallese chocolate. Still some changes could be observed: Recently pandanus keys no longer are cooked in the earth oven, nowadays they are boiled in water and only cooked pandanus is processed on the pandanus crusher.³⁸



Fig. 17. *Jankuun*., about 120 cm long, Kwajalein 2004.

Usually these *dschenäguwe* rolls are about one meter long and 16 cm in diameter. They weight, if I am not mistaken, 20-30 pounds. Then one pound cost ca. 20 Pfennige, but the product is considered very valuable and often the native did not have enough themselves. Bob preserve does not represent a daily food, but is mostly used as sea ration for canoe journeys, chiefs also present each other with it.³⁹

³⁷ Krämer und Nevermann, 1938:135.

³⁸ Interview with Kabot Feb. 9, 2004.

³⁹ Finsch, 1887:142. Jeschke, 1906:273 reports that 20 Pfennig per pound were paid.

In everyday Marshallese life of the year 2004 pandanus preserve is still considered a delicacy. It can be bought in the Robert Reimers Hotel and store, where one roll, about 15-20 cm long and ca. 7 cm wide, costs US \$ 16.50. The supply comes from lone DeBrum, who imports it from Ailuk Atoll.



Fig. 18. *Jankuun* sold in the Hotel Robert Reimers.

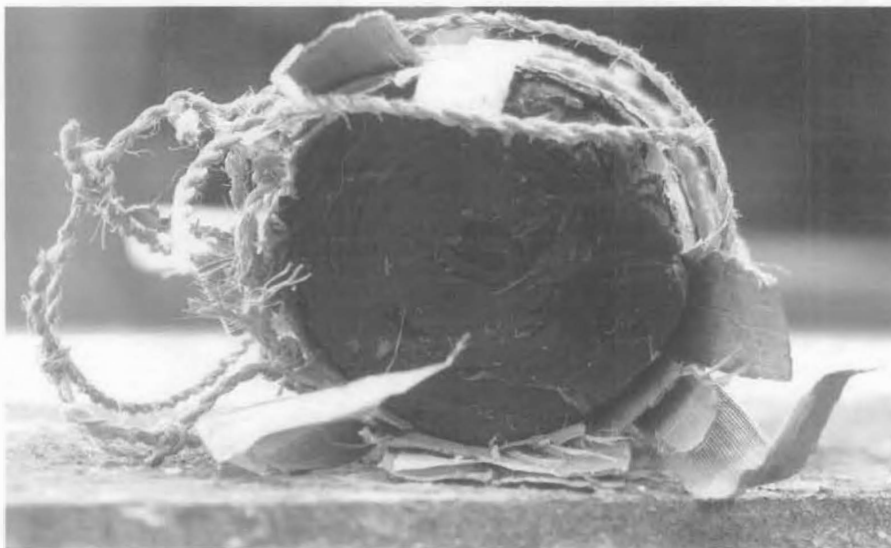


Fig. 19. *Jankuun*, roll of preserved pandanus paste.

E) Recipes for Eating Pandanus.

Most of the pandanus is eaten fresh, chewing on the keys. In the preserved form there are different ways to consume it:

- Cut a slice off and eat it the way it is, like chocolate.
- *Jāānkun* — *mokwaṇ*, pandanus preserve, eaten together with copra.
- *Mokundull* — *mokwaṇ* is mixed with scraped coconut meat and cooked in the earth oven, in form of hand sized balls.
- *Peru* — *mokwaṇ* mixed with starch, such as arrowroot, and then wrapped in leaves and boiled in water.
- *Latuma* — flying fish with pandanus stuffing.⁴⁰
- *Del* — pandanus pudding cooked in hot rocks.⁴¹
- *Rokrok* — pandanus preserve mixed with water.⁴²
- *Mokwaṇ dada* — pandanus juice mixed with grated coconut, uncooked.⁴³
- *Mokwaṇ duul* — pandanus juice mixed with grated coconut, cooked into custard.⁴⁴
- After standing for some time, the pandanus juice turns into a kind of mush, which is also eaten especially when coconut milk has been poured on it in the beginning.⁴⁵
- In one of the old chants Tobin⁴⁶ mentions *tipijek* as a way to prepare pandanus paste, but adds that this is no longer practiced.
- Jeschke reports from Mejit:

The inhabitants produce *chānigun* ... this is a preservation process, where ripe breadfruit is mixed with pounded pandanus kernels. The thick dough is rolled, covered with leaves and senit cord. Thus it can stay for many years and is especially good, because the pandanus on Mejit have a reputation.⁴⁷
- Pandanus Crème Brûlée, a receipt developed by the former chef of Majuro's Outrigger Hotel. It was made from *mokwaṇ* and was quite successful among the customers, so much that it won acclaim and cooking awards in Hawaii as being an innovative idea. This proves that pandanus preserve can be incorporated into modern cooking.

⁴⁰ Abo et al., 1976:419.

⁴¹ Abo et al., 1976:419.

⁴² Abo et al., 1976:419.

⁴³ Abo et al., 1976:209.

⁴⁴ Abo et al., 1976:209.

⁴⁵ Krämer und Nevermann, 1938:134.

⁴⁶ Tobin, 2002:21

⁴⁷ Jeschke, 1906: 272 - 273.

In the past people of the Marshall Islands often suffered food shortages, due to typhoons, lack of rain or other calamities. Then not only pandanus preserves were very useful, but pandanus proved to be a last resort. In times of need those pandanus keys of



Fig. 20. Aerial prop roots of a pandanus tree.

the Lipjenmede kind, that had been already chewed and sucked dry were collected again and beaten in order to open them to get to the small *jibakuñ*, kernels, that have no taste but could be eaten. The Marshallese also felled young pandanus trees in order to drink the juice of the soft stems.⁴⁸ According to another source people ate *liok*, the thick aerial prop roots of the pandanus trees as a famine food, too.⁴⁹ Finsch also noted that in times of food shortage the finely rasped bark of the pandanus tree is added to the pandanus preserve. This preserve is called *tikaka*. When water is added it is kneaded to dough and roasted in form of flat cakes.⁵⁰

⁴⁸ Erdland, 1906:184.

⁴⁹ Krämer und Nevermann, 1938:135.

⁵⁰ Finsch, 1887: 142-143. This is "the food made of rotten and pulverized wood of coconut trees, which Kotzbue and Chamisso mention.

5.2. The making of a Pandanus Crusher.

A) 17. December 2003.

Looking for the right tree - was the important task of the first day. Several types of wood were considered ideal for the production of a pandanus scraper:

kiden – beach heliotropoe tree, *Tournefortia argentea*

kaar – false elderberry, *Premna serratifolia* -

lukwej – alexandrien laurel, *Callophyllum inophyllum*

kōno – island walnut, *Cordia subcordata*

kōñe – ironwood, *Pemphis acidula*; is the best sort of wood for a pandanus crusher, because it is very hard and strong.

All of them are very durable hard woods. This is needed to make this tool. After looking at several trees in the vicinity of the Alele-Museum the right tree was finally found at the end of Rita (Alwal *wāto*), it was a *kaar*, false elderberry or *Premna serratifolia*. This native shrub or small tree grows mainly in rocky areas near the shore.⁵¹



Fig. 21.



Fig. 22.



Fig. 23.

The selected false elderberry tree had the required forking branch that already showed the desired curve of the tool. The tree was not tall and in order to get the required fork the main stem of the small tree had to be cut. The consent of the landowners, Rusina Rusin, was obtained and Renny Titus from the Alele Museum cut the branch off the tree.



Fig. 24.



Fig. 25.



Fig. 26.

It was transported to the Alele-Museum, where in the following days the pandanus scraper was made.

⁵¹ Merlin, 1994:42.



Fig. 27.



Fig. 28.



Fig. 29.

B) 18. December 2003.

Raynard Kabot, established his work place outside the Alele-Museum. This enabled interested parties to watch the progress of the project. He was working under the staircase, which protected him and his workplace from sun as well as rain.

During the first day the rough outline of the pandanus scraper was shaped by first deepening the fork and later hollowing out the underside of the tool.

Thus, during the second day a rough outline of the tool was achieved.

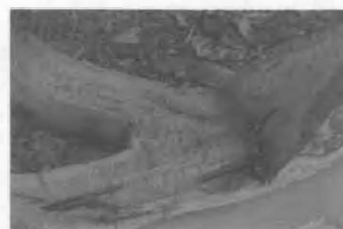


Fig. 30.



Fig. 31.



Fig. 32.

C) 19. December 2003.

The wood was roughly shaped. In the afternoon it had to dry otherwise, it would bent and eventually; break. It is best to dry the wood in the shade.

In former times there were people who knew about the right season when to cut wood. Today, this knowledge is no longer common knowledge and no more observed.



Fig. 33.



Fig. 34.



Fig. 35.



Fig. 36.

D) 23. December 2003

The general outline is roughly shaped. The pandanus crusher is a tool that should be sturdy as pressure is applied to it when crushing the cooked pandanus. It has to have a curve, in order to be elevated from the ground, so that when using it, a container can be placed underneath to collect the sap of the crushed pandanus fruit keys.

E) 24. December 2003.

Smoothing the surface and fitting in the tooth are important tasks, because when working with the tool you have to handle it and it should be smooth. Setting the coconut shell, the so-called tooth, *ñi*, of the pandanus scraper, into the fork needs precise workmanship. The two parts have to fit, then the tooth of the scraper is fitted in and glued into the fork.



Fig. 37.



Fig. 38.



Fig. 39.



Fig. 40.



Fig. 41.



Fig. 42.

The inserted coconut shell tooth also has a sexual connotation, due to its shape the form of the entire tool is considered female.



Fig. 43.

In this respect working on the pandanus crusher and pressing the keys against the tooth, also has a sexual double meaning.

F) 27. December 2003.



Fig. 44. Varnishing the pandanus crusher.

The tool is varnished. Once the varnish dried it is considered finished. The varnish is not a necessity but used solely for the good looks of the tool. It does not alter the taste of the *pandanus* juice. The varnish is not a necessity, the pandanus crusher could just as well be used unvarnished.



Fig. 45. Varnish.

The pandanus crusher made by Raynard Kabot for the Alele Museum is 72 cm long, 37 cm wide and 16 cm high. The inserted coconut-shell is 7 cm high and 9 cm wide.



Fig. 46. Final product, pandanus crusher.

5.3. Different Pandanus Crushers.

The pandanus crusher is still in use in the Marshall Islands. "Not so much in urbanized Majuro, but on the Outer Islands many families still have a pandanus crusher", this was a common remark of informants. In the end it proved to be more difficult that anticipated finding other pandanus crushers in order to compare them with the ones in the collection of the Alele Museum. Therefore we now have to state that no longer all Marshallese households are equipped with a pandanus crusher.

As already mentioned before, according to location - Ratak or Ralik Chain, the name of the tool differs *beka* in the Ratak and *weikan* in the Ralik Chain.

A) Ratak Chain.

Let us first look at *beka*, pandanus crushers from the Ratak Chain. One of the oldest pictures (fig. 47) of a pandanus crusher is in a photograph that Joachim DeBrum took of a small child on a veranda on Likiep.⁵² In the background a *beka* is clearly visible. This example of a Ratakian pandanus crusher can be compared to another old example depicted in Krämer's report of the German South Pacific Expedition.



Fig. 47. Likiep Atoll, ca. 1900, child on a veranda, *weikan* - pandanus crusher in the background.



Fig. 48. *Beka*, pandanus crusher from Maloelap Atoll, ca. 1909.

In fig. 47, the *beka* from Likiep, we cannot identify the material the tooth had been made of. In fig 48, though, part of a shell can be seen attached to the tool. This *beka*, which was collected in Maloelap, also shows a tradition that can be found quite frequently, a small flat surface with raised edges on top where pandanus keys can be deposited.

Both these pandanus crushers (figs 47 and 48) have similar designs and come from islands in the Ratak Chain therefore we will call this the **Ratak design**, in order to distinguish it from other forms of this tool.

⁵² DeBrum Photo Collection, 41/B-105@200.tif. The photograph shows Bernard DeBrum, and therefore can be dated to ca. 1905.

The *beka* with 49) is another design of sports the before deposit pandanus keys. of the Alele Museum it from Namdik Atoll.



Fig. 49. Pandanus crusher, Namdik Atoll.

half a coconut shell (fig. the Ratak Chain. It also mentioned surface to According to the logbook had been donated in 1981

Lekdlik, born in as a carver from Arno pictured in Figs. 50-53. not find wood that fit

therefore had to carve his models patching several pieces of wood together.⁵³

Mili and today well known Atoll, had carved the *beka* He explained that he could his expectations and



Fig. 50. Pandanus crusher, model.



Fig. 51. Pandanus crusher, model.



Fig. 52. Pandanus crusher from Arno Atoll, carved by Lekdlik..

⁵³ Interview with Lekdlik, March 23, 2004, Arno, Arno Atoll.

Some *beka* in the Ratak fashion: Very minimalistic is the *beka* from Lib Island (fig. 70), which is only a fork a tree branch enforced with some sheet of metal as tooth. One pandanus crusher, with his tooth missing, was found in the unlikely place of the



Fig. 53. Pandanus crusher, CMI Library.

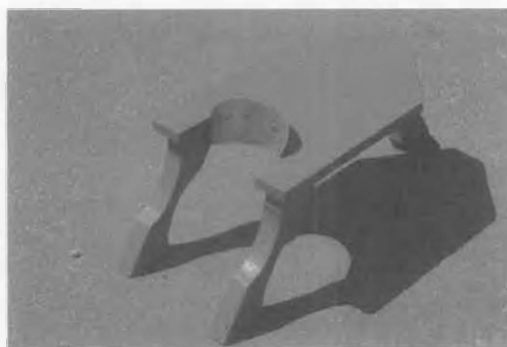


Fig. 54. Modern pandanus crusher.

library of the College of the Marshall Islands. It had been produced by students of the Marshall Islands High School. Finally two more pandanus crushers in the Ratak design (fig. 69 and 71) were documented. Both had also been fashioned by high school students, and were entirely made of plywood. Thus, they can be considered the most recent version of this traditional tool



Fig. 55. Pandanus crusher from Lib Island.



Fig. 56. 'Modern' pandanus crusher.



Fig. 57. Pandanus crusher from Arno Atoll.

B) Ralik Chain.

If there was traditionally a striking difference between the *beka*, pandanus crusher, of the Ratak Chain and the *weikan*, pandanus crusher, of the Ralik Chain could not be established during this research. The only indications are two samples from the German colonial time, depicted in Fig. 68, 69 and 22. But due to the Marshallese semi nomadic life style with frequent travels and the keen eye of Marshallese craftsmen Ratak or Ralik specific designs probably have merged already long time ago.

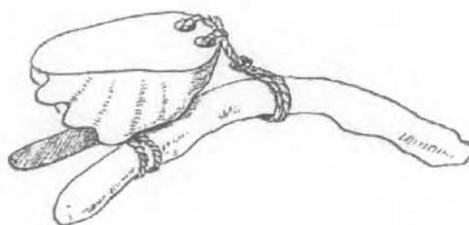


Fig. 58. Pandanus crusher from Jaluit, 1893

Finsch saw the above pandanus crusher on Jaluit and Krämer collected one on Lae.⁵⁴ In comparison to the above mentioned *beka* from the atolls in the Ratak Chain this tool misses the three long legs but is built on something that looks like a solid wooden base.



Fig. 59. Dorsal view of the pandanus crusher in fig 60.

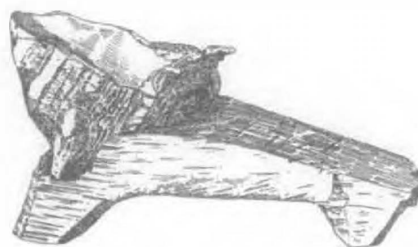


Fig. 60. Pandanus crusher, ca. 1905, Lae Atoll, Ralik Chain.

The helmet shell, *Cassis cornuta*, that is inserted as a "tooth" to crush the pandanus keys serves at the same time to collect the pandanus juice. This example of a pandanus crusher was observed during the German colonial time. The informant of this project, Raynard Kabot, who originally comes from Jaluit Atoll, in the Ralik Chain, still

⁵⁴ Finsch 1887:150. Krämer first published it in 1906 in his book 'Südseerinnerungen, meine 2. Südseereise' and then again from a different perspective in 1938 in 'Ratak-Ralik'.

saw some pandanus crushers like these in the 70s of the last century. Hiatt also reports from Arno Atoll the use of *Cassis cornuta* used as a scraper for cooked pandanus fruit.⁵⁵

C) The Tooth.

According to our informants the tooth of a pandanus crusher has to withstand quite some force, especially when fresh keys are crushed. Though, the crushing of boiled keys needs some strength, too. Therefore the tooth has to be of sturdy material and must have a well-defined edge but not too sharp, because then the keys would be cut and not crushed. Ergo, hard materials, such as shells or coconut shells, were traditionally chosen. Today, the material that ideally fits all these requirements is metal and we find most of the modern pandanus crushers equipped with a metal 'tooth'.

The tooth, where most of the pressure is applied to, has to be well attached to its wooden base. In the old pandanus crushers we see teeth attached with string, today they are all fitted in with a compound of glue and small wood particles, or sometimes are even boldly nailed on or screwed in. The metal for the tooth is obtained from old cans, or scraps of corrugated roofing material.



Fig. 61. Piece of shell as a tooth.

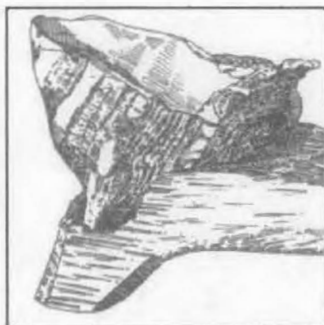


Fig. 62. Half a helmet shell as a tooth.



Fig. 63. Ring of a coconut shell as a tooth.



Fig. 64. Piece of coconut shell as a tooth.



Fig. 65. Piece of metal as a tooth.



Fig. 66. Piece of metal as a tooth.

⁵⁵ Hiatt 1950:8.



Fig. 67. Piece of metal as a tooth.



Fig. 68. Piece of shell as a tooth.

5. 4. Background Information about Pandanus Crushers Found During the Survey.

A) Likiep Pandanus Crusher.



The photograph can be dated to ca. 1905, and was taken on Likiep Atoll. Nothing is known about either the size or the origin of this pandanus crusher nor its material.

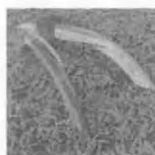
B) Pandanus Crusher from Maloelap.



Around 1910 this pandanus crusher was depicted in Krämer und Nevermann. No measurements are provided.

C) Pandanus Crusher, Collection of the Alele Museum.

This pandanus crusher was made by Letallik, from Arno Atoll, in 2003. It is made by different sorts of wood, which are glued together.



Length:	43 cm
Width:	23 cm
Height:	10 cm
Tooth: Material:	metal
Width:	5.3cm

D) Model of a Pandanus Crusher.

This model of a pandanus crusher was made by Letallik, from Arno Atoll, in 2003. It is made by different sorts of wood, which are glued together.



Length: 25 cm
 Width: 14 cm
 Height: 5.5 cm
 Tooth: Material: coconut shell
 Width: 4 cm
 Height: 2 cm

E) Model of a Pandanus Crusher.

This model of a pandanus crusher was made by Letallik, from Arno Atoll, in 2003. It is made by different sorts of wood, which are glued together.



Length: 21 cm
 Width: 11.5 cm
 Height: 4 cm
 Tooth: Material: coconut shell
 Width: 35 cm
 Height: 1.5 cm

F) Pandanus Crusher from Namdrik Atoll.⁵⁶

This pandanus crusher is part of the collection of the Alele Museum. It had been donated in 1981, and was made by L. Lolin from Namdrik Atoll.



Length: 40 cm
 Width: 16 cm
 Height: 8 cm
 Tooth: Material: coconut shell
 Width: 8 cm
 Height: 5.5 cm

⁵⁶ Museum sheet 00008. April 28, 1981.

G) Pandanus Crusher Made by Raynard Kabot.



This pandanus crusher, was made by Raynard Kabot in 2 003/2004. He used *kaar*, false elderberry, *Premna serratifolia*. The tooth is made of a piece of coconut shell. It is now part of the collection of the Alele Museum.

Length:	72 cm
Width:	36 cm
Height:	16 cm
Tooth: Material:	coconut shell
Width:	9 cm
Height:	7 cm

H) Pandanus Crusher of the Library of the College of Micronesia.



This pandanus crusher is kept in the Library of the College of the Marshall Islands. It was obtained in 1999 by Maxine Becker, the former librarian of the college of the Marshall Islands, from a handicraft store in Majuro for \$ 50 US. The pandanus crusher currently has no tooth but it formerly had one made of metal.

I) 1. Modern Pandanus Crusher.

In 1999 Bernice Joash, the owner of this pandanus crusher, obtained it for \$ 50 at the Marshall Islands High School, where students had built it. It had been built from plywood and is painted green. The metal tooth is screwed in.



Length:	71 cm
Width:	30 cm
Height:	24 cm
Tooth: Material:	metal
Width:	12 cm
Height:	8.5 cm

J) 2. Modern Pandanus Crusher.



This pandanus crusher was made in 2002, by students of the Marshall Islands High School, and purchased by Josepha Maddison-Hill for \$ 75. It is made of plywood and glued together. The metal tooth is screwed it.

Length: 65 cm
Width: 28 cm
Height: 23 cm
Tooth: Material: metal
Width: 11.5cm
Height: 8.5cm

K) Pandanus Crusher from Lib Island.



This pandanus crusher was recorded in April 2004 on Lib Island. No measurements were taken. It is made of one piece of wood and a pig piece of aluminum is nailed in. No measurements were taken.

L) Pandanus Crusher from Arno Atoll.



This pandanus crusher was built by Letallick Johnson, on Arno Atoll.

Length: 39 cm
Width: 19 cm
Height: 12 cm
Tooth: Material: shell
Width: 4.5 cm
Height: 4 cm

M) Pandanus Crusher from Lae Atoll.



This pandanus crusher was collected by Augustin Krämer in Lae Atoll during his first trip to the Marschall Islands and is depicted the first time in 1906 in his book *'Hawaii, Ostmikronesien und Samoa. Meine zweite Südseereise (1897-1899) zum Studium der Atolle und ihrer Bewohner.'* Nothing is known about its size.

N) Pandanus Crusher from Jaluit Atoll.



This pandanus crusher seen by Otto Finsch on Jaluit Atoll and is depicted in Finsch Otto, 1893. *Ethnographische Erfahrungen und Belegstücke aus der Südsee. Beschreibender Katalog einer Sammlung im K.K. Naturhistorischem Hofmuseum in Wien.* Nothing is known about its size.

5. 5. Conclusion.

Today, the two names for the Marshallese pandanus crusher are still well known. *Beka* it is called in the Ratak Chain and *weikan* in the atolls and island of the Ralik Chain. In the course of this research it was established that the pandanus crusher seems to have existed in two different versions, which loosely correspond with the geographic setting of the Marshall Islands. In this report they are called Ralik design and Ratak design. This does not necessarily mean that the Ralik expression *beka* inevitably means a pandanus crusher of the Ralik design, and that vice versa only a pandanus crusher with three long legs, according to the Ratak design, can be called *weikan*. As explained above due frequent travels and wide ranging relationships these terms and designs are intermingled.

Today the Ratak version is predominant. It features a crusher elevated above the ground so that a vessel can be placed beneath to collect the pandanus sap. Therefore the long legs are a requirement to create the necessary space for the bowl underneath where the juice is collected. With the introduction of modern materials the pandanus crusher has been modified accordingly, still featuring its most important components, three long legs and a 'tooth'. Today's many different versions all display these characteristics.

In comparison to the successfully adapted Radak design the pandanus crusher of the Ralik Chain seems to have lost its appeal and has gone out of fashion. The fact that the tooth was at the same time the vessel, attached to its wooden base, might have made it more difficult to handle and less attractive.

The 'tooth' of the pandanus crusher has been modified over the period of the last 100 years. Currently a metal tooth seems to fit all requirements and is attached to most of the tools still in use.

Recently it is no longer true that a pandanus crusher is part of every Marshallese household. Only a few families in Majuro are the proud owners of a pandanus crusher,

Recently it is no longer true that a pandanus crusher is part of every Marshallese household. Only a few families in Majuro are the proud owners of a pandanus crusher, and the same is true for many of the outer islands of the Marshall Islands. One reason might be that no longer are all men able to build a pandanus crusher and teaching it to high school boys has not improved the market. Our informants stated that they mostly built tools for their families. Otherwise they charge \$ 50-70 US. Because of this they are also called upon to repair pandanus crushers, which means in most cases to fit in the old tooth or to replace it.

As pointed out the acquisition of a pandanus crusher costs quite some money. Thus, a considerable sum has to be paid for a tool that is no longer necessary for the survival of the family but only needed to produce a luxury good - *jāānkuun* the Marshallese chocolate, which involves a labor-intensive process, too.

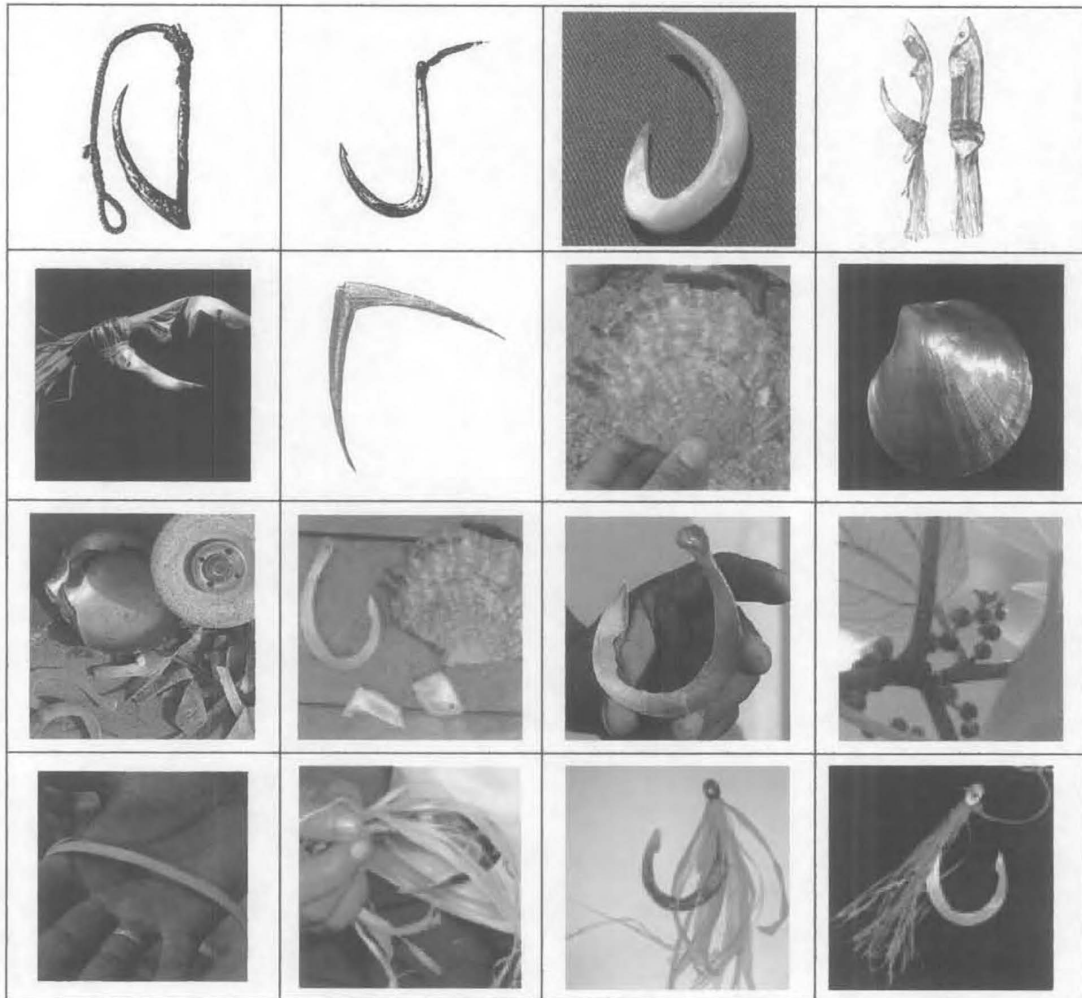
Another reason for the disappearance of the pandanus crusher from Marshallese households is the change of diet. Talking with informants revealed that preserved pandanus, for the production of which the pandanus crusher is a requirement, is no longer popular, too labor intensive or expensive, and thus, not on the daily menu of the Marshallese, who can buy cheap candies and sweets in any store.

But the research also discovered good news - recently a *jāānkuun* revival has started and rolls with the sweet paste are sold again. They can be obtained from Majuro's Robert Reimers Hotel and store. *Jāānkuun* and *mokwan* are served in some restaurants, such as DAR and the 'Tide Table'. Most of this *mokwan* comes from Ailuk Atoll. The revival has been initiated by and is closely related to Ionie DeBrum, a nutrition by profession, who helps people from Ailuk to market their pandanus paste. This enterprise started as a women's project and was successful insofar as today several families sell their pandanus paste in Majuro.⁵⁷ *Jāānkuun* sold in the store has become a popular gift for relatives living abroad, representing a culinary memory of the Marshall Islands.

Final remark: It could not be determined with accuracy which is the correct name for pandanus preserve. In the ethnographic literature often both terms, *jāānkuun* or *mokan*, are used. According to Ramsey Reimer's information, which is attached to the roll of pandanus preserve that you buy in his hotel, *jāānkuun* is the Ralik term for pandanus preserve and *mokan* the word used in the Ratak Chain. Other informants state that *mokan* is the extracted juice from boiled pandanus keys whereas *jāānkuun* is the actual pandanus preserve.

⁵⁷ Interview with Ione DeBrum, April 19, 2004.

VI. *Kāāj*, Fishing Hook.



6.1. Background Research.

One of the main topic on the Marshall Islands is fishing and fish. This is not surprisingly so. As discussed in the 'Introduction' of this report the Marshall Islands are comprised of 1,205 islets (ca. 70 square miles or 110 square km) spread across an area of over 750,000 square miles (1.2 million square km). Therefore its population has to rely on seafood, in addition to the land crops. In pre-contact time fish was the main protein source of the Marshallese diet. And this is still the case on many of the Outer Islands. In 1914 Erdland wrote:

Since ancient time fish was their main food they [people on the Marshall Islands] had to rely upon and they cherished it so much that they developed a craving for it, when they have to remain a few days without it.¹

Fish still is one of the staple foods in the diet of the Marshall Islanders. People living in the urban centers maybe eat less fish than those living on the so-called Outer Islands, where still a sort of subsistence economy is practiced.

In order to comply with the need of protein the fishermen of the Marshall Islands were specialists, knowing about the lifestyle of the fish, their habitat and character. They not only knew about their islands and the sea they were also well aware that they cohabited the islands of the Ratak and Ralik Chain together with spirits and supernatural beings. Accordingly they pursued the fish with specifically designed fishing gear, fishing methods, and fishing chants. They respected taboos, rules, and regulations to ensure their well being and fishing luck.

A) *Kāāj* - The Simple Fishing Hook.

Several forms of simple fishhooks existed on the Marshall Islands.

Simple hooks, made of mother pearl without a barb, are used for catching bonito, etc. On their upper end they have a notch in order to fasten the line there. Otherwise they are simply rounded. Usually they are from 2 1/2 cm to 3-4 1/2 cm long, some of them even longer. Today they have all been replaced by metal hooks. Their local name is *kādj. gāt* etc. Hooks like these made from trochus shell have a very similar form but a pointed and smooth upper end (Stuttgart 1c 85892) They seem to be quite rare.²

One hook found in Majuro in a grave has the form of such simple mother pearl hooks but is made of bone. Contrary to the mother pearl hooks, it is (about 8 1/2 cm long) and has a barb-like sting on the outer side of the end of the hook. For attaching the

¹ Erdland, 1914:46.

² Krämer und Nevermann 1938:117.

line two beads have been carved all around the upper end. Today this hook is in the Museum in Leipzig.³

Other simple hooks were used to catch shark.

Hooks for catching sharks (*kāj in kābögogo*) are made from wood of the iron wood tree. ... They are fashioned in such a way that the wood of the tree forms the shaft and the wood of the branch forms the curved hook.

Thus, quite often a sharp angle is achieved at the bottom of the hook, but there are also many hooks with are round, these are better for fishing bonito than for catching sharks. In most of the hooks the barb is missing but then the hook is bent more towards the shaft. When the wood does not allow such a form, then a small pointed piece of wood is attached by binding it to the hook, which is then pointing towards the shaft. The upper end of the shaft is



Fig. 1. Wooden hooks for shark fishing.

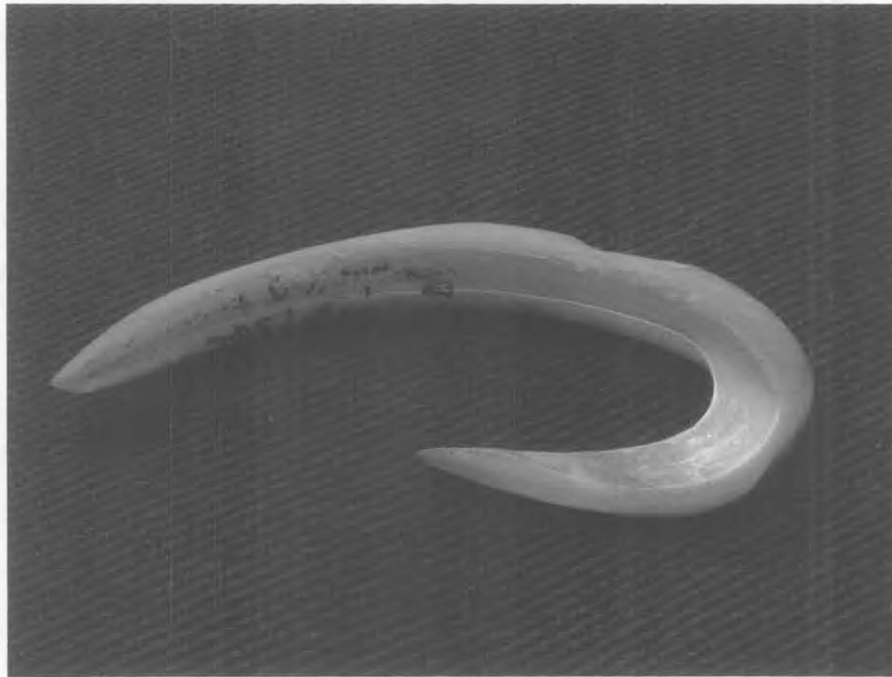


Fig 2. Hook from the Museum in Stuttgart.

³ Krämer und Nevermann 1938:119. At the time of writing the collection of the Museum in Leipzig could not be accessed and therefore no photograph provided (personal correspondence with Melk-Koch, curator

notched in order to attach a thick line made of *aremue*-fibers. The line consists of several strands, which are twisted together. Its attachment at the end of the hook is surrounded with another line. The same is done at the loose end where a loop is formed. In this loop the actual line is fastened. As shark-hooks are often lost they are neither fashioned carefully nor made of special wood, in order to not to have a big loss.

Big fishing hooks made of bone have a similar form like the round shark-hooks, but in most cases they are more elongated and have a simple barb. This makes it unnecessary to bend the tip of the hook towards the shaft. In order to attach the line the outside edge of the end of the shaft has ca. four teeth, while the inside remains smooth, or 2—3 beads are carved at the end of the shaft. The material for such hooks comes from the Pottwal and sometimes also from porpoises.⁴

Another form of a simple hook was a sickle-like hook used for catching *jojo*, flying fish, during the day. Again, this was a design to fit a specific fishing technique, in order to catch a certain fish.



Fig. 3. Fishhook for catching flying fish.

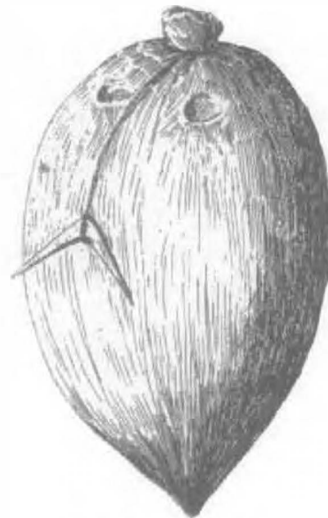


Fig. 4. Float and hook.

Fishhooks, for catching flying fish, *kādj in redjip*, were made from a strip of coconut shell, in form of a sickle, with one end usually longer than the other. The hook was connected to an empty coconut shell by a line and the coconut shell was closed with a stopper to create a float. The fishing line, made of bohemia (*aremua*) was usually stored in there.⁵

The hook is fastened to a short line and danced on the surface behind the canoe, because the empty coconut shell was used as a float. The *rōjep* becomes embedded

of the collection).

⁴ Krämer und Nevermann 1938:118-119.

⁵ Krämer und Nevermann 1938:117.

crosswise in the fish's mouth, and the fisherman pulls his catch out. ... in one day hundreds of fish were caught with such extraordinary hooks ...⁶

B) The Composite Hook.

In order to mention all hooks used in the Marshall Islands, the composite hook is also included here.

Erdland describes the composite hook like this:

Even today [1914] this hook, made from the part of the lock of the pearl shell, is considered the best for catching big fish. Such a hook consists of two parts: the shaft and the curved hook made of bone or shell. The shaft is pointed at both ends. In order to attach it to the fishing line a hole is drilled at the base, while the edges of the opposite end have notches. In these notches lies the line, which holds the hook, that has also a hole drilled at the base, well attached to the shaft. It turns out the quality of the shell is quite divers. The best ones are sold for 2 – 4 German Mark [1-2 US Dollars]. People from Namdrik Atoll make good business with them.⁷

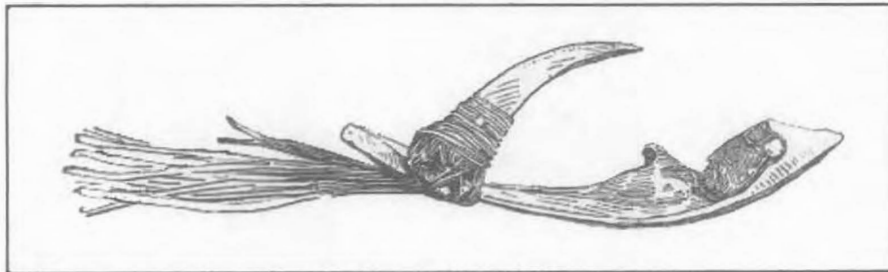


Fig. 5. Composite hook.

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Shafts (*ri*) made of yellowish mother pearl (*ri*) were the most valued ones, whereas the majority was silver whitish (*äalmuf*). Sometimes dark (*buerik kimmi*) or greenish shafts are used. One shaft in the collection of the Museum in Stuttgart (Ic87577)

⁶ Erdland 1914:48-49.

⁷ Erdland 1914:47-48.

⁸ Erdland 1914:47-48.

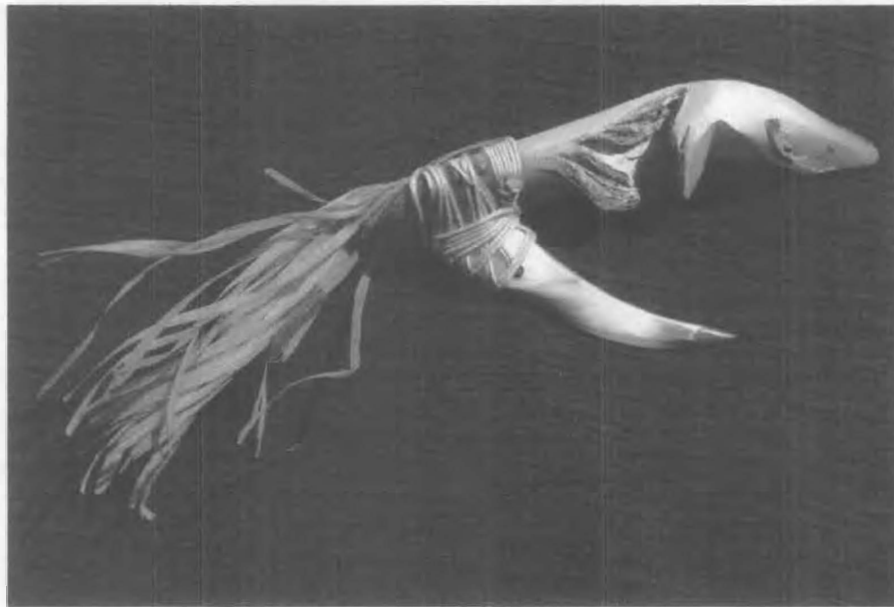


Fig. 6. Composite hook, Alele Museum.

from Kwajalein is even made from *pejao*, the red spondylus shell. The actual hook (*midj*) could be made of different materials such as mother pearl, bone or rarely turtle shell (*buer in wuin*). It is fastened to the shaft with a string of *we*. Since the 70s of the 19th century Marshallese fishermen use imported iron hooks.⁹

Finsch reports that in former time fishhooks could also be made from a shaft of mother pearl and the hook from a sperm whale tooth. Hooks like these were considered especially valuable.¹⁰ Quite rare were also those hooks where the hook was attached to a shaft with the help of a string going all along the shaft.¹¹ These sort of hooks were specially produced on Namerik and Majuro, but already during the German colonial time, in 1879, Finsch lamented it a dying craft, as such hooks were no longer common and no more in use. On Majuro, a part of such a hook was found under a tree of Djemelivut.¹² The composite hook is one of several different fishing hooks developed by Marshallese fishermen. It is carefully designed to fit the habits of skipjack, bonito, albacore, and tuna and commonly used for trolling in the lagoon or the open waters of the Pacific Ocean.

⁹ Krämer und Nevermann 1938: 117-118.

¹⁰ Finsch, 1895:146; Finsch, 1914:132.

¹¹ Krämer und Nevermann, 1938:118.

¹² Krämer und Nevermann, 1938:118.

C) Fishing Methods.

In order to catch tuna, the line is fastened to the sailing canoe, and the fisherman is hooking again and again. The fish is attracted by the blinking mother pearl shell and jump after the supposed fish. With a quick jerk the fisherman drives the hook into the gum or the side of the mouth of the fish. Already before the German colonial time many Marshallese fashioned hooks from metal in order to catch more fish.¹³

Fishing chants and incantations were an important part of traditional fishing in the Marshall islands. In 1911 Father Wendler reported on some fishing chants and incantations:¹⁴

When the hook is thrown into the water the fisherman sings *errabu, errabu, errabu, kijen bago, errabu, errabu, errabu, kijen jilo* - hallo, hallo, hallo, food for the sharks, hallo, hallo, hallo, food for the bonito. Jerking the line up and down. If no fish bites for a long time, the man holding the fishing line shouts to the one steering the canoe: *kuon mane janilik eo, janilik eo le ne rarlikij i öro binmate jon na i mur*, this means that he was wishing his mat clothing would smell as good as sweet smelling oil, so that fish could follow the perfume and bite. And if somebody wanted to catch a big fish then he was shouting: *kabbue in buk ilijik lekalal judakda*, which means keep away from the wind at the tip of the island (the reef) there resides the most noble one. Once one of the happy ones has a fish on his hook, he shouts: *e gojik*, which means he bit; and when the fish is trashing he chants the following strophe:

*E judak emij eri,
E judak emij eri
Alen ruo,
E judak muijmuij
E judak bukbuk
Muijmuij itwaj ikien bāin
E gojik iek.*

He stood up
He is caught
He is caught
He is put into pieces
The sinew of my arm
Stretches
But the fish is hooked

In this way every fisherman had his very own spiritual lure and, on a fishing trip, all men were shouting and chanting their very own alluring invitation to the fish.

¹³ Erdland 47-48.

¹⁴ Wendler, 1910:488.

6.2. Making a *Kāāj*, Fishing Hook.

A hook, like the informant had made, had been found in the earth on Jaluit, where the Informant had seen it. Using modern electrical tools, it took the informant one week to produce one hook. Therefore, it may be assumed that in prehistoric time the production of such a hook was a much more time consuming enterprise.

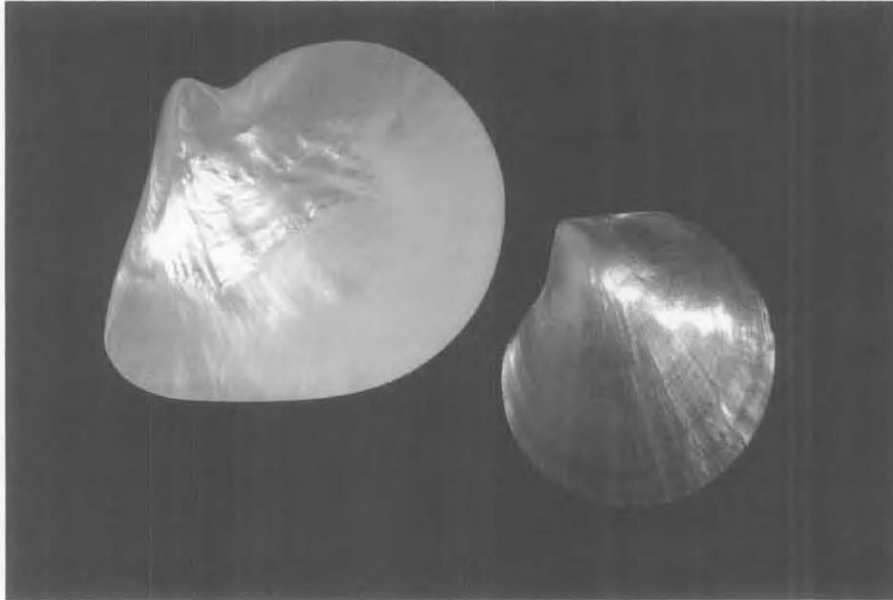


Fig. 7. *Di*, pearl shell.



Fig. 8. *Di*, pearl shell, outside.

Fish hooks are made of *di*, pearl shell, because the material is durable and shiny, which attracts fish, thus, it is a good lure as well.

The pearl shells for this project were obtained from the pearl farm in Arno, which is operated by Virgil Alfred.

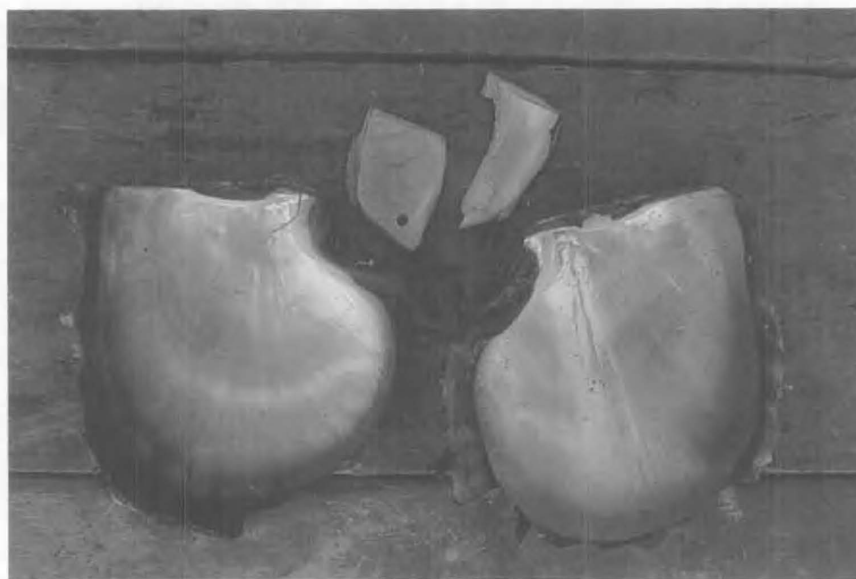


Fig. 9. Pearl shell, inside.

Before starting the informant selected the right shell, which should not be cracked and had to be thick. He then smoothened the outside surface of the shell and drew the outline of the hook on the surface of the shell.



Fig. 10.



Fig. 11.



Fig. 12.

The shape of the hook was cut out from the shell with the help of an electric saw, and its edges were smoothened. Then a hole was drilled in at the top in order to fasten a line there.



Fig. 13.

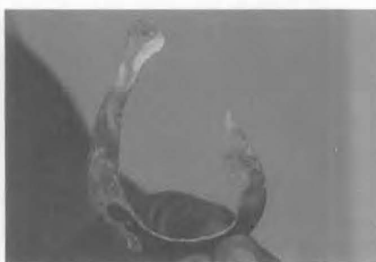


Fig. 14.



Fig. 15.

He made the fringes of the hook as well as the fishing line of *armwe*. The informant had his *armwe* supplies brought from his home island Jaluit. "*Armwe*," he explained, "cannot be constituted by anything else". In order to produce the sturdy fiber, the tree is stripped of its bark, which is soaked in water for one week. Removed from the water the inner layers of the bark have already separated (just like *lo*, hibiscus fibers). *Armwe* is an ideal material, because it is thin and strong. Just two fibers can be twisted together and will make a strong line for fishing or lashing.



Fig. 16. *Armwe*, silver pipturus.

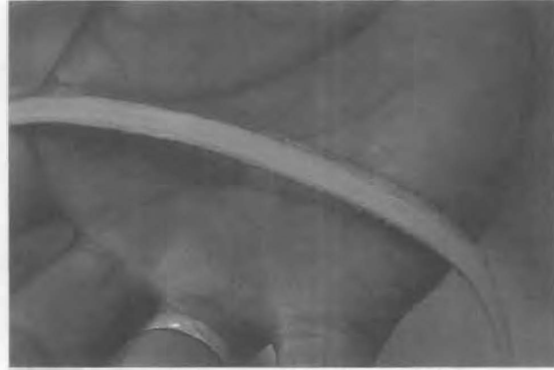


Fig. 17. *Armwe*, silver pipturus bark

The final hook is 11.5 cm long, 6.5 cm wide, its fringes are 14 cm long. Today it is housed in the Alele Museum.



Fig. 18. Lashing *armwe* fibers to the hook.

According to the informant Raynard Kabot, "such mother pearl hooks were used to catch yellow fin tuna. The best bait is *kilwod*, the inner part of the bark of a breadfruit tree branch. It should be from a young and soft branch. When breaking off the branch you can clearly see it. You can also use the young green leaves of pandanus. Yellow fin tuna like them".

6.3. Conclusion.

Today nobody in the Marshall Islands uses hooks made of mother pearl, and a hook, as the one produced by the informant, has only educative and decorative value. When men go fishing they use metal hooks, which can be purchased from many stores in Majuro.

Marshallese fishermen had soon realized the advantages of metal hooks. A German who had been shipwrecked on Ailuk around 1880, reports:¹⁵



Fig. 19. Final product, *kāāj* - fishing hook.



Fig. 20. Final product, *kāāj* - fishing hook.

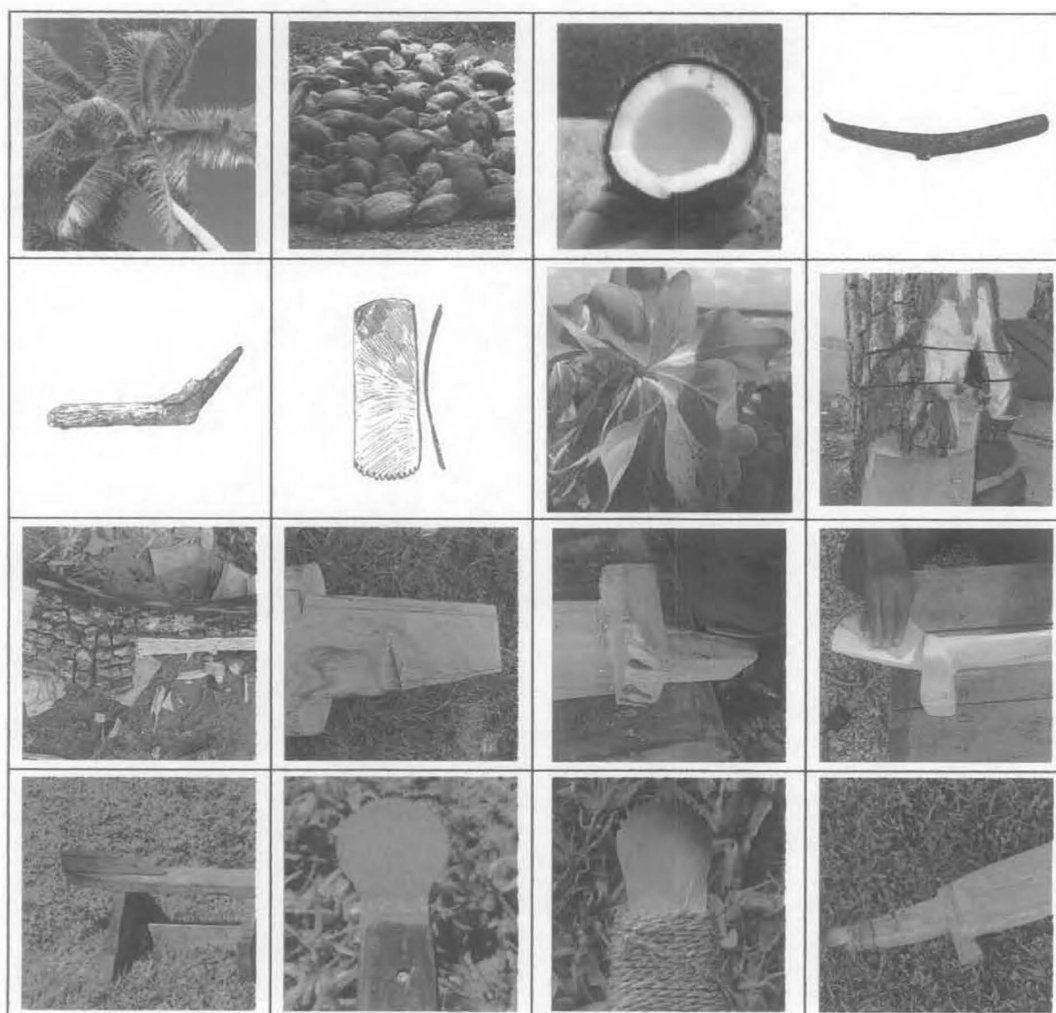
¹⁵ Eisenhardt, 1880:224.

From wire obtained from the wreck of the 'Corpheus' we fashioned fishing hooks, which the natives, once they had observed us, painstakingly copied with better results than ours. Generally they showed great skill in the production of tools.

Traditional Marshallese fishing hooks were soon exchanged for imported ones and if these were not available the fishermen simply fashioned their own, made of wire or scrap metal.

From this point of view this project, offered a glimpse into the past.

VII. *Raanke* - the Coconut Scraper.



7.1. Background Research.

A) *Ni*, Coconut Palm Tree.

Cocos nucifera, a tree often referred to as the tree of life. The first settlers brought it with them to the Marshall Islands. On the sandy soils the coconut grows well and supplies people with building material for houses and food.



Fig. 1. *Ni*, coconut tree.

Today the coconut tree is a food as well as a cash crop, providing many Marshallese households with some income. Copra, the dried meat of the coconut, was of major importance during the German Colonial time when the vegetation of many atolls in the Marshall Islands was dominated by coconut plantations. Due to the international price for copra, which is currently 36 cents per pound, the local producers get paid 12 cents per pound. From April 2003 to April 2004 the Marshall Islands produced 4,451.49 tons of copra. All this coconut meat is not domestically used.



Fig. 2. Coconut.

This report deals with the *raanke* and thus refers to *weini*, the brown, ripe coconut and its use in connection with the *raanke* in daily life of the Marshall Islands.

B) The coconut and its use in Marshallese Life.

Coconut and especially grated coconut is used almost daily in Marshallese life.

The coconut is a favorite of the as long as the kernel is soft and can be loosened from the shell with the thump. ... The ripe nut is rarely eaten piece by piece but only after it has been grated with the help of a shell or a piece of iron, and the flakes have been added to other dishes.¹

From a culinary point of view coconut milk is an essential part of Marshallese cooking as well as for the preparation of coconut oil. Coconut milk is made of grated coconut flakes, which are mixed with water and pressed through a piece of cloth or in former times an *iñpel*, coconut cloth. Besides cooking, coconut milk, as well as coconut oil, are used as hair and skin care. Thus, even today a *raaneke*, the tool to grate coconuts is an essential tool for all Marshallese households.

C) *Raneke* — The Coconut Scraper.



Fig. 3. *Raanke*, coconut scraper, ca. 1900.



Fig. 4. *Raanke*, coconut scraper, ca. 1900.

The *raneke*, coconut scraper, consists of a piece of breadfruit or *Fragraea* (*wut*) wood. It can be shaped like a board or have two feet. One protruding end juts forward and slightly upwards, there a blade is attached. It is fastened into a slight hollow of the surface with sennit cord. These *kirirr*, blades, consist of a long and concave piece of *dri*, mother pearl, of which the protruding end is slightly rounded and dentate. Instead of the mother pearl blades quite soon iron blades with teeth have been used.²



Fig. 5. Blade made of mother pearl.

¹ Erdland, 1914: 37.

The *raanke* is a household item that is considered male, due to its phallic form and maybe in contrast to the pandanus crusher, which is considered female. It is a tool mostly used by women doing their daily cooking chores, and in this respect it can evoke sexual associations.

5. 2. The Making of a Coconut Scraper.



Fig. 6. Looking for the right tree.



Fig. 7. Cutting the *kiden* tree on the beach.



Fig. 8. Raynard Kabot eyeing the *kiden* tree.

The production of the *raanke*, coconut scraper, started on Januray 21, 2004 when the crew, informant, Raynard Kabot, cameraman Hespy John, handyman Rennie Titus,

² Krämer und Nevermann, 1938:130.

and the anthropologist went to look for the right tree. In his lifetime Raynard Kabot had made about 20 *raanke*. Not all had the same design as the one he did for this project. Design and size was always predetermined by the material he used. Thus the size of the wood or when he had no wood the plywood would be of importance for the finished product.

The best wood for a *raanke* is *kōñe*, ironwood, because this wood is very hard so that even the blade of the *raanke* can be made of the wood. The other choices of wood are *kiden*, beach heliotrope, and *kono*, island walnut.³

Finally at Kabañbañ, on the lagoon side behind the airport the ideal tree was spotted. It was *kiden*, a beach heliotrope.⁴



Fig. 9. Cutting the *kiden* tree.



Fig. 10. Cutting the *kiden* tree.

Two pieces of wood were brought to the Alele Museum, where in the following days the *raanke* was shaped out of one piece of wood.

First the rough shape was outlined and hewn from the wood.



Fig. 11. Rough shape of the *raanke*.



Fig. 12. Rough shape of the *raanke*.

³ Interview with Raynard Kabot March 3, 2004, Majuro.

⁴ *Turnefortia argentea*.



Fig. 13. Rough shape of the *raanke*.



Fig. 14. Rough shape the *raanke*.



Fig. 15. Rough shape of the *raanke*.



Fig. 16. Rough shape of the *raanke*.

From the rough shape the actual shape is modeled, with sandpaper.



Fig. 17. Shaping the *raanke*.



Fig. 18. Shaping the *raanke*.

Traditionally there were several choices of material of which to make the blade of a *raanke*. In case the *raanke* was made of ironwood then the blade could be part of the tool, as ironwood is hard enough to be used as a blade. Otherwise a piece of shell,

coconut shell, or *liok*, the hard root of pandanus trees could be inserted as a blade. Raynard Kabot chose to use a *mejen raanke*, blade, made of *di*, oyster shell. He attached it with screws, sawed out the teeth and later on covered the base of the blade and the screws with *kkwal*, sennit cord.

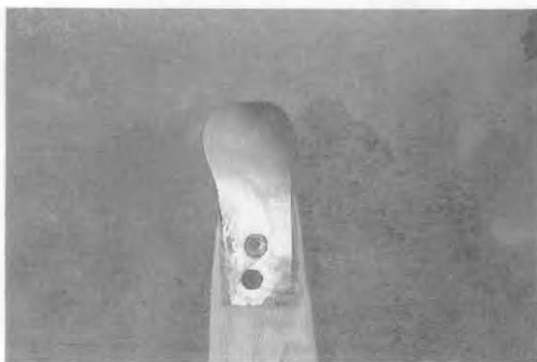


Fig. 19. Blade of the *raanke*.



Fig. 20. Blade of the *raanke*.

Today most *raanke* in Marshallese households have a metal blade bought in the stores, which are simply nailed onto the tool.

Finally the *raanke* was varnished and considered finished. It is 66 cm long, 13 cm wide and 9 cm high. The blade is 4cm wide and 8.5 cm long.



Fig. 21. Final product, *raanke*, coconut scraper.

5.3. Background Information about Pandanus Crushers Found During the Survey.

A) *Raanke* collected by Finsch.



This coconut scraper was documented around 1909 and is depicted in Krämer und Nevermann, 1938:130. No measurements are provided.

B) *Raanke* collected by Krämer.



This coconut scraper was recorded around 1900 and is depicted Krämer, 1905:141. No measurements were provided.

C) *Raanke* made for the Alele Museum.



This pandanus crusher was built by Raynard Kabot for this project and is today housed in the Alele Museum.

Length: 66 cm
Width: 13 cm
Height: 9 cm
Blade: Material: pearl shell
Width: 4 cm
Length: 8.5 cm

D) *Raanke* of Bernice Joash.



This coconut scraper was made in 2000 by students of the Marshall Islands High School, it cost \$ 75 US. It is made of plywood and glued together. The metal blade is screwed on it.

Length: 52 cm
Width: 34 cm
Height: 23 cm
Tooth: Material: metal
Width: 4.5 cm
Length: 8.5 cm

E) *Raanke* of Josepha Maddison-Hill.



This coconut scraper was made in 2001 by students of Majuor High School, and was sold for \$ 90. It is made of plywood and was the biggest one encountered during this research.

Length: 75 cm

Width: 40 cm

Height: 28 cm

Tooth: Material: metal

Width: 4 cm

Length: 7,5 cm

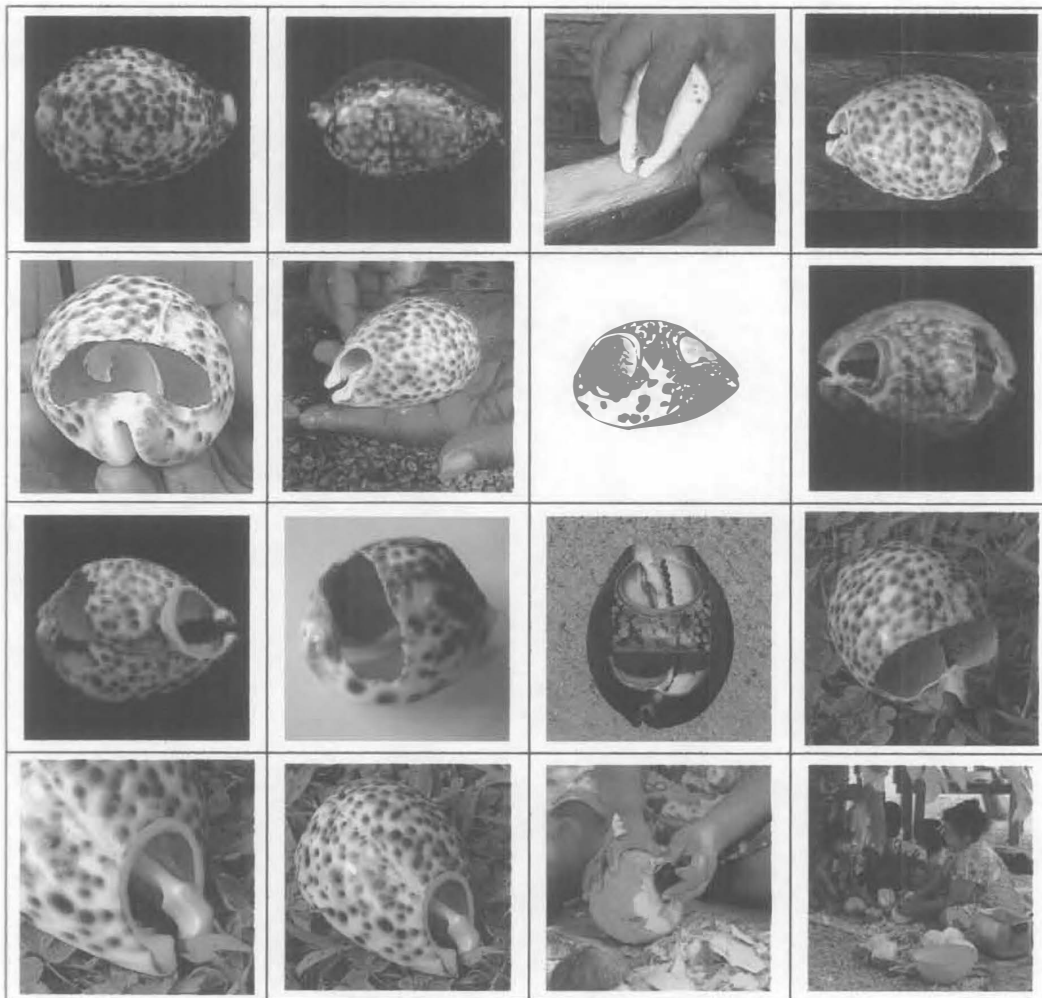
5.4. Conclusion.

The *raanke* from 1900 differ slightly from the tools in use today. The recent coconut scrapers are more elevated, looking like a small stool and are quite comfortable to sit on. In this respect the *raanke* made by Raynard Kabot for the Alele Museum, was also much lower than the ones made of plywood and documented during this survey.

In the course of this research it was not difficult to find different *raanke* for documentation, because it still is a common household good and in frequent demand. As already mentioned most of them were made of plywood and its owners had no complains about that.

Raanke are used in all the households of the Marshall Islands, for the production of rasped coconuts from which coconut milk can be produced. This is an essential component in Marshallese cooking and freshly scraped coconut is also used for washing the body and the hair. Women, who usually do the cooking, are also the main users of this tool. Even though the *raanke* is a household tool, which is in constant demand, not every household does possess one. Then, they are borrowed from neighbors and family, because life simply is not possible without a *raanke*, coconut scraper.

VIII. *Jikwi* - the Breadfruit Peeler.



8. 1. Background Research.

A) *Mā* — Breadfruit, *Artocarpus altilis*.

Like many of the food crops *mā*, breadfruit, was introduced to the Marshall Islands by the early settlers. They are found on all the atolls of the Marshall Islands. Breadfruit trees are usually planted next to compounds because they not only offer food, they also offer shade. Thus they are often indicators of abandoned house sites.



Fig. 1. Breadfruit trees on Lib Island.

More than 20 names are known for different cultivated varieties in the Marshall Islands. These include *Petaaktak*, *Bukdqi*, *Mākinono*, *Mejwaan*, *Mwejenwe*, and *Metete*. The smooth-skinned cultivars normally bear fruit earlier, taste sweeter, and have firmer flesh. The rough skinned types bear fruit later, may taste bitter, have looser flesh, and occasionally produce seeds.

The breadfruit tree *mā* (*Artocarpus altilis*) is a major traditional food crop of the Marshall Islands. It has several uses as a source of food, medicine, wood, wrapping, and glue.¹

B) Breadfruit and Its Use.

Breadfruit is a seasonal fruit. *Añōn rak* is known as breadfruit season (June to October) when most of the fruits are ripe.

¹ Merlin, plate 6.

A "Mekinono" (a variety of breadfruit with deeply incised leaves) was observed in Mille, which, according to the local school teacher, bears the year around. The Mille Mekinono stands in front of the council house on Ngalu Island. It is said to belong to Laibon.²

The breadfruit, or jackfruit, as it is referred to in some ethnographic literature is quite delicate. Even today it is still considered staple food in the Marshallese diet and accordingly there are many different ways to prepare breadfruit, most of time peeling it is a requirement.



Fig. 2. Breadfruit

There are eleven different varieties which have to be distinguished in fruits for the chiefs and those for the commoners, according to their quality, or if they have nuts inside or not. Both the biggest varieties (*bataktak* and *bugerol*) have to be served to the chiefs. Common people can only eat them when there are plenty. The lower part of the fruit is considered the sweetest one. The kernels are eaten like chestnuts, but they are not specially roasted. Once the breadfruit has been cut with the help of a long pole it is kept in fresh water in order to keep it from ripening too soon. But be aware never to eat - out of superstition - an overripe fruit that fell from the tree, because then when climbing a tree you will, just like the fruit, fall from it and break your limbs.³

The before mentioned breadfruit season is also the time when villages are busy preserving breadfruit. In order to make breadfruit durable it is peeled, quartered, and the

² Hatahway, 1952:6.

³ Erdland, 1914: 37-38.

core is cut off. These breadfruit pieces are then packed in bags and placed into the lagoon, for some days. When the bags are removed from their ocean bath the breadfruit is squeezed with the hands and traditionally stored in a hole in the ground. Today plastic or metal containers are used for this purpose. In this way breadfruit can be preserved for some time.

C) *Jikwi* — The Breadfruit Peeler.

Breadfruit being a staple food in the Marshall Islands, we can assume that *jikwi*, breadfruit peelers, were a common household tool. Nevertheless this tool is hardly mentioned in the ethnographic literature of the Marshall Islands, probably overlooked because of its smallness.

The first time the *jikwi*, breadfruit peeler found entry in ethnographic texts is in Krämer's Ratak Ralik account, together with a drawing.⁴ In 1990 Dirk Spennemann documented the use of the *jikwi* breadfruit peeler, which can be viewed online.⁵ The peeler made by the informant was quite like the one made nearly 100 years ago and it can be assumed that the design was a success and has not changed over time.

The Marshallese Biodiversity report states:

... cowries have played a part in the preparation of food in the Marshalls since ancient times. The glass like thick porcelain of larger cowries (primarily tiger *C. tigris*, but also the tortoise *C. testudinaria* and the mourning *C. mauretanica*) often became *ken kabwiro*, tools for peeling breadfruit. Imported potato peelers, knives and other utensils have become quite common in recent years. However, especially on the outer islands, the "*ken kabwiro*", the traditional cowry peelers, are still made and used to a limited degree even to this day.⁶

The sharpened opening at one end of the *jikwi* is used to peel the breadfruit. The opening at the other end, which is usually much wider, is needed for the peels to fall off.

⁴ Erdland, 1914: 37-38.

⁵ <http://marshall.csu.edu.au/html/Handicraft/thumbnails/>

⁶ Biodiversity Report, 2000:37.



Fig. 3. Breadfruit peeler, ca.1900.

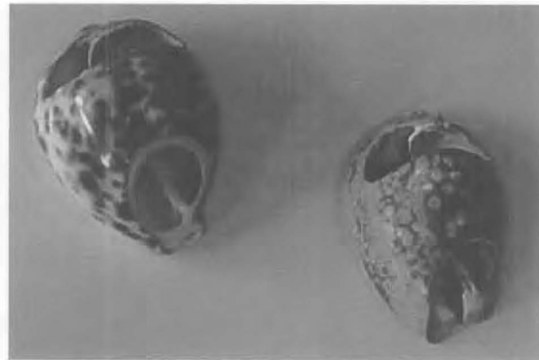


Fig. 4. Breadfruit peeler, 2001.

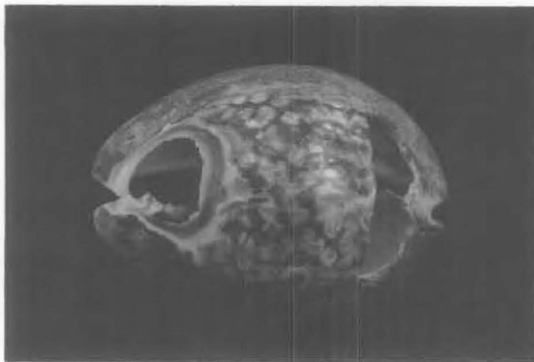


Fig. 5. Breadfruit peeler, Alele, Museum.

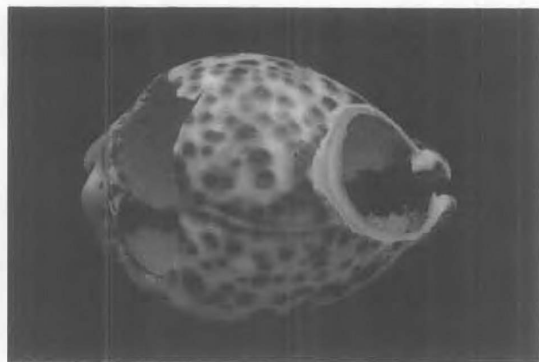


Fig. 6. Breadfruit peeler, Alele, Museum, 1981.



Fig. 7. Breadfruit peeler, Alele Museum 2004.



Fig. 8. Breadfruit peeler, Lib Island 2004.



Fig. 9. Peeling breadfruits.



Fig. 10. Breadfruit peeler in use.

Today, there are not many *jikwi*, breadfruit peelers made of shell, any more employed as in most households breadfruits are peeled now with a knife. But, as can be seen in the video documentation, women still can handle a *jikwi*.

8.2. The Making of a Breadfruit Peeler.

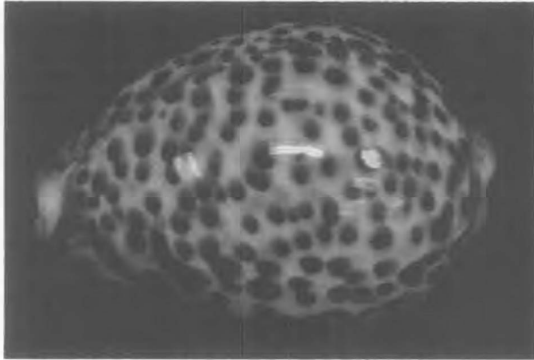


Fig. 11. *Juke*, tiger cowry, *Cypraea tigris*

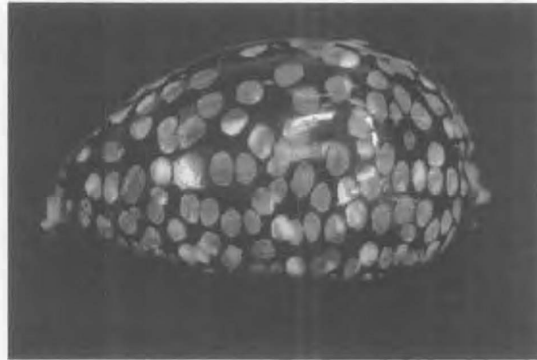


Fig. 12. *keke*, humpback cowry, *Cypraea mauretania*.

In 2002, a staff member of the Alele Museum brought some shells from Namu Atoll. One of them was used for this project.

The raw material for *jikwi*, can be any *juke*, cowry shell either tiger or humpback cowry., they both can easily be found, way out on the ocean side reef. The other cowry shells, such a *Cypraea aurantium* and even the prized golden cowry are considered too soft or brittle, to make a good *jikwi*. Because of their sturdiness and because they are so common and grow to a size, which can easily be held in one hand, they furnish the best material for a breadfruit peeler. Raynard Kabot choose a tiger cowry shell for his *jikwi*. He filed off one end and hollowed the other, making a big hole, where the peels can fall out of the tool. He used modern tools for his work.

8.3. Background Information About Breadfruit Peelers Documented During this Survey.

A) *Jikwi* of Krämer, ca. 1900.



This breadfruit peeler was documented around 1900 and is depicted in Krämer und Nevermann, 1938:130. According to the drawing it is a tiger cowry, *Cypraea tigris* shell. No measurements are provided.

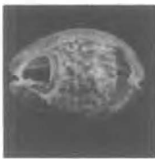
B) 1. *Jikwi* of the Alele Museum, 1981.



This bread fruit peeler is made of a tiger cowry shell. According to the Alele Museum documentation (temporary receipt 00013) it was donated by Mrs. Tira Eport in 1981. This breadfruit peeler is made of a water-worn shell.

Length: 8 cm
Width: 5.5 cm

C) 2. *Jikwi* of the Alele Museum.



This bread fruit peeler is made of a *keke*, humpback cowry shell. No background information is known. This breadfruit peeler is made of a water-worn shell.

Length: 7.5 cm
Width: 5.5 cm

D) 1. *Jikwi* of Dirk Spennemann, 2001



This bread fruit peeler is made of a *keke*, humpback cowry shell. It is documented in Spennemann, Marshallese Handicrafts -- Breadfruit Peelers -- A Photo Essay (<http://life.csu.edu.au/marshall/html/Handicraft/Breadfruit.html>) No background information available.

E) 2. *Jikwi* of Dirk Spennemann, 2001.



This bread fruit peeler is made of a tiger cowry shell. It is documented in Spennemann, Marshallese Handicrafts -- Breadfruit Peelers -- A Photo Essay (<http://life.csu.edu.au/marshall/html/Handicraft/Breadfruit.html>) No background information available.

F) *Jikwi* of Junior Jorju, Lib Island, 2004.



This bread fruit peeler is made of a *keke*, humpback cowry shell. It was documented on Lib Island, but its place of origin is unknown. The tool was not measured.

G) *Jikwi* made for the Alele Museum, By Raynard Kabot, 2004.



This breadfruit peeler was built by Raynard Kabot for this project and is today housed in the Alele Museum. It is made of a *juke*, tiger cowry shell.

Length: 8.5 cm

Width: 5 cm

8.4. Conclusion.

The *jikwi*, breadfruit peeler, is a traditional Marshallese tool in its purest sense, as it has not changed over time. Recently it is replaced by knives.

IX. GLOSSARY.

9.1. General

Marshallese	from old sources	English
A		
<i>aelon kein</i>		these islands
	<i>äkejab</i> Erdland, 1914:346-347	spirit
<i>añōn ean</i>		pandanus season (January to March).
<i>añōn rak</i>		breadfruit season (June to October).
B		
<i>Beka</i>		pandanus crusher
<i>bubu</i>		divination.
I		
<i>irooj</i>		chief
<i>iroojlaplap</i>		paramount chief
J		
<i>jikwi</i>		breadfruit peeler
<i>'jolet jen Anij'</i>		gift from God
<i>joorāne</i>		land signs
<i>joormeto</i>		sea signs
<i>jowi</i>		clan
K		
<i>kāāj</i>		fishing hook
<i>kajin</i>		language
<i>kajin majel</i>		Marshallese Language.
M		
<i>majel</i>		Marshallese
<i>meto</i>		stick chart
R		
<i>raanke</i>		coconut scraper
W		
<i>weikan</i>		pandanus crusher
T		
<i>timon</i>		demon

9. 2. *Beka* or *Weikan*, Pandanus Crusher.

Marshallese	from old sources	English
A		
Alwal <i>wāto</i>	Alorkwōm Tobin, 2002:87	land parcel in Rita, Majuro Atoll
<i>anenean</i>	Annānu Tobin, 2002:87 Anperia Tobin, 2002:87 Aujoñ Tobin, 2002:87 <i>armwe</i> Merlin, 1994:37.	pandanus variety time when pandanus fruits are harvested and processed pandanus variety pandanus variety pandanus variety silver pipturus.
B		
<i>beka</i> (Ratak)	<i>bjugor</i> Krämer, 1905:142.	pandanus crusher three edged stone to beat pandanus keys
<i>bōb</i>	Bōbijak Tobin, 2002:87 <i>Bōb irooj</i> Merlin, 1994:37.	pandanus, screwpine, Pandanus tectorius. pandanus variety pandanus variety that ripens before all other varieties,
<i>bukbuk</i>	<i>bugien</i> Krämer +N., 1938:141. <i>bui</i> Krämer, 1906:428. <i>chānigun</i> Jeschke, 1906: 272 - 273. <i>Eki</i> Tobin, 2002:87	pandanus reserved for the chiefs grill for pandanus preserve coconut shell ripe breadfruit is mixed with pounded pandanus kernels pandanus variety
D		
	<i>del</i> Abo et al., 1976:419. <i>dschenāguwe</i> Finsch, 1887:142. <i>dschengue</i> Kurze, 1887:79. <i>dschibugebuge</i> Finsch, 1887:150. <i>djänogin in bob</i> Krämer, 1906:428.	pandanus pudding cooked in hot rocks. rolls of pandanus preserve pandanus preserve container made of a helmet shell, Cassis cornuta pandanus preserve, a roll
J		
<i>jankuun</i>	<i>jāānkun.</i> Merlin, 1997:36.	pandanus preserve pandanus preserve pandanus preserve
<i>jāānkuun</i>	Ratak: <i>jār</i> Krämer, 1906:428. <i>jār</i> Krämer, 1906:428. <i>jād</i> Merlin, 1997:36. <i>jenkon</i> Kurze, 1887:79.	to scrape the thick juice onto a board dryers, several grills over each other wooden drier for pandanus preserve roll of preserved pandanus
<i>jer</i>	<i>jinnōb</i> Merlin, 1997:36.	pandanus preserve drier
<i>jibakuñ</i>	Joiibeeb Tobin, 2002:87. Jolio Tobin, 2002:87. Joilokwaar Tobin, 2002:87.	kernels in Lipjenmede pandanus soup made of pandanus preserve pandanus variety pandanus variety pandanus variety

K <i>kaar</i>	Jomwin-jokur Tobin, 2002:87. Jomwinjōn Tobin, 2002:87. Julele Tobin, 2002:87.	pandanus variety pandanus variety pandanus variety
	<i>kabibie</i> Krämer, 1905:142. <i>källomurmur</i> Scafft, 1903:451 <i>kalaomuremur</i> Krämer, 1905:142.	false elderberry, <i>Premna serratifolia</i> to beat pandanus keys thin pandanus juice pandanus juice
<i>kiden</i>	<i>killok</i> Krämer, 1905:142. <i>kilok</i> Merlin, 1997:36. <i>kilok bōb</i> Krämer, 1905:142. <i>kilok in bit</i> Krämer, 1905:142.	beach heliotropoe tree, <i>Tournefortia argentea</i> to scrape juice out to scrape juice out to scrape juice out of the pandanus to crush pandanus keys in hurriedly, with both hands, 'Gilbertese fashion'
<i>kōne</i>		Pemphis acidula;
<i>kōno</i>	<i>kono</i> Krämer, 1905:142.	a pit lined with pandanus leaf mats
L	Kurajak Tobin, 2002:87	island walnut, <i>Cordia subcordata</i> pandanus variety
	<i>latuma</i> Abo et al., 1976:419.	flying fish with pandanus stuffing a man from Lib Island
Lejorimo		aerial prop roots of the pandanus trees
<i>liok</i>		pandanus variety with kernels in the keys
Lipjenmede	Lipjinmede Tobin, 2002:87 <i>lq</i> Merlin, 1994:37. <i>loarmwe</i> Merlin, 1994:37.	pandanus variety at pandanus variety pandanus variety
Lōjokdād	Lopiñpiñ Tobin, 2002:87 Lukjānmeto Tobin, 2002:87	pandanus variety woman of the pandanus tree
<i>lukwej</i>		alexandrien laurel, <i>Callophyllum inophyllum</i>
M		
<i>mang</i>	<i>Madmad</i> Merlin, 1994:34.	Island, on Namdik Atoll
<i>mā</i>	<i>maramuir</i> Krämer, 1906:428. <i>mogan</i> Chamisso, 1986:148. Krämer, 1906:428. <i>moggan</i> . Scafft, 1903:451.	pandanus leaf strips preparation of pandanus preserve breadfruit tree preserved pandanus
<i>mokundull</i>	Mōjeel Tobin, 2002:87. <i>peka</i> Merlin, 1997:36.	thick pandanus juice, which is used for the preparation of the pandanus preserve pandanus variety pandanus leaf mat preserved pandanus is mixed with scraped coconut meat and cooked in the earth oven, in form of hand sized balls.
<i>mokwaŋ</i>	<i>mokwaŋ dada</i> Abo et al., 1976:209.	preserved pandanus pandanus juice mixed with grated coconut, eaten uncooked

N <i>ñi</i> P <i>peru</i>	<i>mokwan duul</i> Abo et al., 1976:209.	pandanus juice mixed with grated coconut, cooked into custard
R	Ralik: <i>rebakebak</i> Krämer, 1906:428. <i>rokrqk</i> Abo et al., 1976:419. Rupijin Tobin, 2002:87.	tooth, 'tooth' of a pandanus crusher
T	<i>tikaka</i> Finsch, 1887: 142-143.	preserved pandanus mixed with starch, such as arrowroot, then wrapped in leaves and boiled in water.
Tibotin	<i>tipijek</i> Tobin, 2002:21	pandanus preserve mixed with water to scrape the thick juice onto a board
U	<i>um in kilok</i> Krämer, 1906:428. Tobin, 2002:87.	pandanus variety
Uöttöt <i>utilomar</i>	Töbotin Tobin, 2002:87.	pandanus preserve mixed with rotten and pulverized wood of coconut trees
W <i>weikan</i> (Ralik)	no longer way to prepare pandanus paste	most common pandanus variety
W	<i>waikan</i> Merlin, 1997:36.	pandanus variety
<i>wegang</i>	<i>wegang</i> Krämer, 1905:142.	pit in the ground
<i>wuëgang</i>	<i>wuëgang</i> Finsch, 1887:150.	pandanus variety
<i>Guettarda speciosa</i>	pandanus leaf mat	pandanus crusher
	pandanus crusher	pandanus crusher

9.3. *Kāāj*, Fishing Hook.

Marshallese	from old sources	English
A		
	<i>äalmuj</i> Krämer + N., 1938:118-119.	silver whitish
	<i>aremue</i> Krämer + N., 1938:118-119.	silver pipturus
<i>armwe</i>		silver pipturus
B		
	<i>buer in wuin</i> Krämer + N., 1938: 117-118.	turtle shell
D		
<i>di</i>		pearl shell, mother pearl
E		
	<i>e gojik</i> Wendler, 1910:488.	"he bit"
G		
	<i>gät</i> Krämer + N., 1938:117.	simple hook
J		
<i>jojo</i>		flying fish
K		
<i>kāāj</i>		fishing hook.
	<i>kädj</i> Krämer + N., 1938:117.	simple hook
	<i>kāj in käböogo</i>	hooks for catching sharks
	Krämer + N., 1938:118-119.	
	<i>kädj in redjip</i> Krämer + N., 1938:117.	hooks, for catching flying fish
<i>kilwod</i>		the inner part of the bark of a breadfruit tree branch, used as bait
	<i>kimmi</i> Krämer + N., 1938:118-119.	greenish
L		
<i>lo</i>		Hibiscus tiliaceus
M		
	<i>midj</i> Krämer + N., 1938: 117-118.	actual hook
P	<i>pejao</i> Krämer + N., 1938: 117-118.	red spondylus shell
R		
	<i>ri</i> Krämer + N., 1938:118-119.	mother pearl, shafts of lures
	<i>rôjep</i> Erdland 1914:48-49.	hook for catching flying fish

9.4. *Raanke*, Coconut Scraper.

Marshallese	from old sources	English
D		
<i>di</i>	<i>dri</i> Krämer + N., 1938:130.	oyster shell mother pearl
I		
<i>iñpel</i>		coconut cloth
K		
<i>Kabañbañ wāto</i>		strip of land on the lagoon side, west of the airport
<i>kiden</i>		beach heliotrope, <i>Tournefortia</i> <i>argentea</i>
<i>kōñe</i>	<i>kirirr</i> Krämer + N., 1938:130.	blade
<i>kono</i>		<i>Pemphis acidula</i>
<i>kkwaļ</i>		island walnut, <i>Cordia subcordata</i> sennit cord
L		
<i>Liok</i>		aerial prop roots of the pandanus trees
M		
<i>mejen</i>		blade
N		
<i>ni</i>		coconut palm, <i>Cocos nucifera</i>
R		
<i>raanke</i>		coconut scraper
W		
<i>wāto</i>		land parcel
<i>weini</i>	<i>wut</i> Krämer + N., 1938:130.	brown, ripe coconut <i>Wedelia trilobata</i>

9.5. Jikwi, Breadfruit Peeler.

Marshallese	from old sources	English
A <i>añōn rak</i>		breadfruit season (June to October)
B	<i>bataktak</i> Erdland, 1914: 37-38.	breadfruit variety has to be served to the chiefs
	<i>bugerol</i> Erdland, 1914: 37-38.	breadfruit variety has to be served to the chiefs
J <i>jikwi</i> <i>juke</i>		breadfruit peeler cowry shell
K <i>keke,</i>		humpback cowry shell
M <i>Mā</i>	<i>ken kabwiro</i> Biodiversity Report, 2000:37.	for making preserved breadfruit
	<i>mā</i> Merlin, 1994:plate 6.	breadfruit, jackfruit, Artocarpus altilis.
	<i>Mekinono</i> Hatahway, 1952:6.	breadfruit variety
N	<i>Ngalu</i> Hatahway, 1952:6.	Island. in Milli Atoll

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