REPUBLIC OF THE MARSHALL ISLANDS

MINISTRY OF INTERNAL AFFAIRS

HISTORIC PRESERVATION OFFICE

Archaeological Survey of Rongelap Atoll

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HPO Report 2001/02

The research and this publication have been financed entirely with Federal funds from the Historic Preservation Fund grant program in partnership with the National Park Service, Department of the Interior, United States of America. However, the contents and opinions expressed do not necessarily reflect the views or policies of the National Park Service, the Department of the Interior, or the Government of the United States of America, nor does the mention of trade names or commercial products constitute endorsement or recommendation by the National Park Service, the Department of the Interior, Government of the United States of America, or the Government of the Republic of the Marshall Islands.

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For bibliographic purposes this report may be quoted as:
Williamson, Richard and Donna K. Stone, 2001, *Archaeological Survey of Rongelap Atoll.* HPO Report 2001/02 Majuro Atoll, Republic of the Marshall Islands: Historic Preservation Office.

LIBRARY CODE

KEYWORDS
Anthropology – Marshall Islands – Rongelap Atoll
Archaeology – Marshall Islands – Rongelap Atoll
History – Marshall Islands – Rongelap Atoll
Marshall Islands – Anthropology – Rongelap Atoll
Marshall Islands – Archaeology – Rongelap Atoll
Marshall Islands – History – Rongelap Atoll
Micronesia – Marshall Islands – Archaeology

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The following monograph is the result of research conducted between July 27 – 31, 1998 at Rongelap Atoll, Republic of the Marshall Islands. The research consisted of non-intrusive, terrestrial archaeological reconnaissance survey. The projects were 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. We could not have performed the survey without the assistance of many individuals at the Historic Preservation Office and Alele Museum. Most especially, Hemley Benjamin, Assistant Archaeologist and the individual who assisted the actual survey; Clary Makroro, the Deputy HPO; Benice Joash, Executive Director at Alele; Ninbo Frank, Alele's video technician; and Terry Mote, Alele's Historic Preservation Specialist. Our further thanks go to the Minister of Internal Affairs and Chairman of the RMI Advisory Council for Historic Preservation, the Hon. Nidel Loak, as well as the Secretary of Internal Affairs and Historic Preservation Officer, Mr. Frederick deBrum. Finally, our deepest thanks goes to the people of Rongelap Atoll who we hope will one day soon get to live in their ancestral islands.

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Majuro Atoll, Marshall Islands
March 2001

I. Introduction

This report represents the results of archaeological research conducted on Rongelap Atoll, Marshall Islands. The field trip took place from July 24 to August 3, 1998, with the actual investigations occurring July 27 – 31, 1998. The remainder of the time was spent traveling to the atoll by boat from the capital atoll of Majuro. All field documents, including completed site survey forms, field notes, maps, photographs are housed at Historic Preservation Office, Majuro Atoll, Republic of the Marshall Islands. No artifacts or food remains were collected. The US National Park Service Historic Preservation Fund grant provided funding.

1.1 Project Objectives

The purpose of the survey was two-fold. The first was to identify, record, and evaluate the historic, prehistoric, and traditional sites located on the atoll in accordance with the survey and inventory program area of the Historic Preservation Office. The second was to educate the inhabitants of the atoll on the importance of protecting and preserving the sites that the team identified. As such, the Historic Preservation Office made every effort to include the local population, their elected officials, and traditional chiefs and landowners in every step of the research. Local informants and guides were used throughout the research and formal and informal lectures covering the activities of HPO staff were conducted at the schools, town halls, and churches of each island that was visited.

1.2 Evaluation of Research Design and Methods Used

A) "Non-intrusive" reconnaissance survey

The research conducted was a "non-intrusive" reconnaissance survey. The team did not remove any artifacts and/or food remains. The sites were identified through either a walking survey or from knowledge of local guides. The sites were recorded using a Geographical Position System (GPS) unit and that data was entered into ArcView Geographical Information System (GIS) software to generate maps. Information for Site Survey Forms was entered into the GPS unit in the field and was transferred into the database software that is contained in the ArcView program. Slide photographs as well as digital photos of all sites were taken. All note, survey forms, GPS data, and photographs are housed at the Historic Preservation Office, Majuro Atoll, Republic of the Marshall Islands.

Evaluation was based upon the Republic of the Marshall Islands site significance levels established by the RMI Historic Preservation legislation of 1992. A site was considered very significant if it met at least one of the Marshall Islands' formal criteria [RMI Historic Preservation Legislation, "Regulations Governing Land Modification Activities, Section 6(2)(a)]:

(i) the resource is the only one of its kind known in the Republic; or

(ii) the resource is part of an ensemble of sites, even if the individual sites as such would not be considered to be very significant; or

(iii) the resource is considered to be a prime example of the workmanship of a particular architect, builder or craftsman; or

(iv) the resource is rich in cultural artifacts and undisturbed by construction activities; or

(v) the resource is particularly well preserved and shows little or no alterations to the original appearance of the structure; or

(vi) the resource is connected with historic events or persons or oral traditions important beyond the limits of the individual atoll on which the resource is located.

As the survey was designed to be intensive and non-intrusive, no test excavations were conducted and no artifacts were collected. The purpose of the survey was purely to identify and record the sites in order to allow evaluation of each site's significance level, which will be used to establish eligibility for inclusion on the RMI National Register. Future researchers can use this information in assessing which sites are deemed significant enough to warrant further research, analysis, interpretation, and/or protection and restoration. The survey followed the standards and guidelines of the grantor, the United States Department of Interior National Park Service Historic Preservation Fund.

B) Nomenclature

In assigning sites, the system used in the Marshall Islands includes three two-letter abbreviations and then a site number. The first abbreviation identifies the site as located in the Marshall Islands (MI), the second is the atoll, Rongelap (RN), the third the islet, Rongelap (RN). Therefore the site MI-RN-RN-001 is the first site identified on the islet of Rongelap in the Rongelap Atoll.

C) Survey Equipment and Team Members

The following equipment was used in the survey:

1 Trimble GPS unit with Pathfinder Office 2.02 software
ArcView 3.0a GIS software
1 Sony Mavica MVC-FD83 digital camera
1 Canon EOS Rebel 2000 SLR camera with slide film
2 5m metal tape measures
1 30m cloth tape measure
1 roll of flagging tape
Notebooks, pens and pencils
1 compass

Field team members included Staff Archaeologist, Richard Williamson, and Assistant Archaeologist, Hemley Benjamin. Donna K. Stone, Staff ethnographer, provided historical background.

D) Informants/Guides

Fieldwork relied heavily on informants and guides. The informants provided information on the location and history of sites, while the guides, if not the informants

themselves, lead the team to the sites. Key-informants[1] were the elders of the community, who as custom dictates were also the government leaders, and so were the most knowledgeable about atoll history. They provided a never exhausting pool of knowledge to be further investigated ethnographically. Since precisely locating sites on the various islets was problematic the use of guides was essential. Information was obtained in casual meetings throughout the duration of the fieldwork; no formal questionnaire was developed.

E) Survey Methods

The survey did not include the total landmass of each islet visited. When informants or guides could not lead the team to the potential sites on the islets the following method was applied. The crew was distributed at five to eight meter intervals and surveyed the islets from north to south or east to west. Areas of the extremely dense vegetation were left out due to the lack of appropriate clearing tool (machetes). When a site was noted, a site number was assigned, a GPS position was taken, the area was photographed, and site survey forms were filled out. In areas of dense vegetation, the GPS position was sometimes taken several meters away from the site itself.

1.3 Limitations of Research

Although the purpose of the survey was to identify potentially significant sites, it must be remembered that the survey was non-intrusive. Shovel test pits were not conducted and given time and money constraints, much of the survey relied heavily upon the local informants and their knowledge of historic sites. The survey attempted to be as extensive as possible, but included no follow-up intensive research. As such, this report should be considered preliminary and only includes those sites readily identified either visibly or with the aid of an informant. Given previous research in the Marshall Islands that has included either shovel test pits or more intensive excavations, it is apparent that prehistoric archaeological sites in this type of non-intrusive reconnaissance survey will be highly underrepresented. This is especially true in the Marshall Islands where the lack of durable artifacts such as ceramics is lacking.

A further limitation was encountered with the generation of maps using the GPS unit and ArcView GIS software. Problems encountered were two-fold. First, it was impossible to remove the selective availability that the US Department of Defense uses to "scramble" GPS coordinates, thus giving some error in the recording of exact locations of the sites. Second, the digitized map of the Marshall Islands used by the HPO is one that was originally made by the Japanese during their administration of the Republic. The map was updated by the U.S. during the Trust Territory of the Pacific Islands administration, but still prone to many errors. While most of these errors were external, there were instances of internal inaccuracies. Unfortunately, this was still the most up-to-date map available at the time of the research. However, in recording the GPS readings in the field, the GPS unit that was used did allow for the recording of a series of readings

[1] Ethnographically defined as individuals who have been interviewed intensively or over an extensive period of time for the purpose of providing a relatively complete ethnographic description of the social and cultural patterns of the group. In the present case "key-informant" refers to those individuals who provided general and specific information on almost every site investigated.

(120 points were recorded) that averaged out to one reading per site. This should remove some of the inaccuracy caused by the selective availability. Regarding the maps, as the data is stored electronically in ArcView GIS software, when an updated map of the Marshall Islands is available, the new digitized map can be replaced for the older version. For the purpose of this report, the maps cannot give much more than a "general" location of each site. However, in the section describing the sites, the GPS coordinates for each site are provided.

1.4 Previous Research

The lack of previous research conducted was one, if not the main, criteria for the selection of Rongelap Atoll. In accordance to the Historic Preservation Office's survey and inventory program area, Rongelap Atoll was selected to be surveyed by the HPO staff. Unfortunately, the planned survey of Rongelap was pushed forward due to the beginning of construction on the atoll for eventual resettlement. With no commercial service (wither by air or sea) to Rongelap Atoll, the research team accompanied the initial construction team by way of an LCU, and without a small watercraft available surveyed only the main islet of Rongelap as that is where the construction was to occur. The team then had to leave with the LCU three days later as the next return service was three months later.

Although no previous research had been conducted on Rongelap Atoll, previous researchers have included overviews of the history and prehistory of the Marshall Islands. Some of the better overviews include Beardsley's 1994 report (1994: 1-28) and the Historic Preservation Plan United States Army Kwajalein Atoll (1996: 3.3-3. 21). The comprehensive study carried out under the leadership of Paul H. Rosendahl (1979, 1987) during March-June 1977 did not include Rongelap. That expedition, which became known as the "Louis L. Kelton-Bishop Museum Expedition to Eastern Micronesia," covered parts of Majuro, Mili, Arno, Aur, Maloelap, Wotje, Likiep, Wotho, Lae, Namu, Ailinglaplap, and Ebon Atoll, as well as, Lib Island in the Marshall Islands.

1.5 A Brief History of the Marshall Islands

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 of the Islands were a handful of wayfarers seeking an uninhabited autonomous area where they could live (Hart 1992). What little we know about early Marshallese comes from oral history and early accounts by explorers.

Marshallese autonomy was threatened as early as 1526 when the first of eight known Spanish ships passed through the area. The first recorded sighting, probably Bokak, was made by Alonso de Salazar, commanding the *Santa Maria de la Victoria*, but no contact was made (Levesque 1992a, Sharp 1960). In 1529 contact was made by Alvaro de Saavedra of the *Florida* which laid anchor to take on provisions at Enewetok or Bikini and stayed for eight days. He also discovered Utirik, 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. (Levesque 1992a, Sharp 1960).

In 1565 Alonso de Arellano of the Legaspi expedition sighted Likiep, Kwajalein, and an island thought to be Lib (Sharp 1960) while Legaspi 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 Marshalls, 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. (Levesque 1992b)

Fifty seven years passed before another vessel is reported to pass through the Marshalls. The Dutch ship *Eendracht* and ten other vessels of the Nassau Fleet, commanded by Admiral Gheen Schapenham sighted Bokak (Hezel 1979). In spite of Spain's annexation of the Marshall Islands in 1686, the Spanish established no trading posts, 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 Rongelap (Sharp 1960, Hezel 1979). Even though the Spanish were the first known westerners to see the Marshall Islands credit is given to Captain William Marshall, commander of the *Scarbough*, who together with Thomas Gilbert of the *Charlotte* for 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 Nadidik (Sharp 1960). They also sighted the previously discovered Wotje, Erikub, Maloelap, and Ailuk.

Captain Henry Bond aboard the British merchantman vessel *Royal Admiral* sighted Namorik and Namu in 1792. Two years later The British ship *Walpole*, under the command of Captain Thomas Butler sighted Eniwetok. Thomas Dennet was the first westerner to sight Kili as well as reporting on Ailinglapalap, Lib, and doing some trading on Namu in 1797. Other vessels sailed through the area, the British snow *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 1808 by Captain Patterson of the British merchant brig *Elizabeth* both of which landed and did some trading (Sharp 1960, Hezel 1979, 1983).

The first scientific exploration of the Marshalls was conducted by the Russian, Otto von Kotzebue in 1816-17 and 1824. It is during this time that first significant contact between Europeans and the 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 (Kotzebue 1821, 1830; Chamisso 1986).

The account left by this expedition provides the first early ethnographic material, including an interesting description of how Kotzebue was urged to help defeat a powerful southern Ratak chief and thus, it was said, become chief of all Ratak. Kotzebue declined the offer. Kotzebue 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. LeMari troops used these new weapons to defeat the powerful Majuro chiefs and establish control over the Ratak Chain (Erdland 1914, Kramer and Nevermann 1938).

Other ethnographic observations come from Lay and Hussey (1828) who survived the Globe mutiny at Mili Atoll and Paulding (1970) a U.S. Navy lieutenant who helped to retrieve Lay and Hussey. These early observers published accounts which give us an insight to traditional personal appearance, manners, food, and dwellings and in a lesser extent facets of political and social organization reflecting traditional practices.

The prospects of profitable trade lured the German entrepreneurs into the Marshalls in the latter part of the 19th century. Subsequent contact with outsiders gradually increased as whalers concentrated their activities. They were hunting to provide lamp oil to meet European and American demand. With the whalers, a disruptive and intolerant group as well as the English blackbirders in search of cheap labor to work the mines and plantations in the New World and Australia, encounters turned hostile. Numerous ships were cut off by the Marshallese and the crews killed, brutal retaliations followed, and the mood of contact in the first half of the 19th century was one of brutal confrontation (Hezel 1979, 1983; Dye 1987)

The treacherous reefs, small number of whales, and the new methods of distillation of kerosene from crude oil soon put the whalers out of business. The blackbirders 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 cut off and the entire crew killed) (Hezel 1979). 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 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 foreigners (Dye 1987). Ebon remained the mission center, from which occasional trips were made through the southern atolls, until 1880, when the station was removed to Kusaie in the eastern Carolines.

Changes in the Marshallese way of life had been rapid and extensive. For half a century 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 them. Instead the missionaries were "not only indifferent, but supremely scornful of the religious beliefs [of the Marshallese]. They try to extinguish them completely and destroy every trace of them" (Knappe 1888). The German ethnography summarized by Erdland (1914) and Kramer and Nevermann (1938) coincided with major structural changes in Marshallese way of life. These changes had been rapid and extensive. 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" (1914:307).

Other factors were of course also effective in these changes. The copra trade dates from about 1860 in the Marshalls 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.

European political empire reached into the Pacific in the 1880s and German traders were exercising increasing influence in the Marshalls. In 1885, the Marshall Islands became a protectorate of Germany, as 'the Marshall islands were not under the sovereignty of any civilized state' (Pauwels 1936). During the German era, which lasted until 1914, the atolls were visited regularly by traders, missionaries, and administrative officials. Administration of the area was carried out by the Jaluit Gesellschaft, a trading company, from 1887 on. This firm, which resulted from a merger of companies active in the area, Robertson and Hernsheim, and Deutsches Handels- und Plantagen-Gesellschaft (D.H.P.G.) (formerly Johann Godeffroy 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 (Hezel 1983).

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. 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 between the *Irooj* (Hiery 1995).

Warfare between island chiefs was eliminated, an act which froze the relative social positions of the chiefs and their clans 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 (Spoehr 1949). German ethnographers were active in this period and it is largely through their efforts, especially in the many volumes published on Micronesia by the German South Sea Expedition of 1908-1910, that much is known of the traditional way of life (Kramer and Nevermann 1938 is a result of this expedition).

In 1914, Japan succeeded the Germans in control of the Marshall Islands. They shifted to a system of virtual direct rule through a set of community officials and greatly expanded the administrative staff. 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 general the Marshallese appear to have gotten on well with the Japanese (Spoehr 1949). The Japanese did ethnographic research however most of this material has yet to be translated.

The Japanese military, through the South Seas Defense Corps, governed the Marshalls until 1918. From 1918 until 1922, a combined civilian and military government was in charge. In 1922, Japan was awarded Micronesia as a Class 'C' mandate by the League of Nations. The terms of the mandate were upheld until 1933 when Japan withdrew from the League of Nations (although they continued to submit

annual reports through 1937), and considered the Marshalls and the rest of their Micronesian mandate, an integral part of the Japanese Empire (Peattie 1988).

During the Japanese era, 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 (Peattie 1988).

For the Marshallese, improvements 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" (Shuster 1978).

Education was also segregated and of differential quality. The Japanese were offered a school system identical to the one in Japan; the Marshallese received three years of primary education consisting mostly of Japanese language instruction and ethics classes, with an additional two years for the promising students (Hezel 1995).

The Japanese administration also attempted to make a number of changes in the Marshallese social and political organization. They appointed Marshallese leaders, contrary to the existing political structure, thus weakening the position of the traditional leader (Bryan 1972). The Japanese also attempted to change the Marshallese social organization of matrilineality to conform to patrilineality, more like their own system, with little success.

In early 1930s, Japan began to construct fortifications on Kwajalein, Jaluit, Wotje, Mili, and Maloelap. Marshallese were conscripted to labor on these buildings and were resettled on other atolls (Peattie 1988). 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 (Smith 1955). The U.S. fortified Enewetak and Kwajalein atolls as military bases.

After World War II the United States took over trusteeship of 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; and Davenport (1952, 1953) and Chambers (1969, 1972) concentrating on oral traditions.

1.5.1 Important Historical Events for Rongelap Atoll

~500 BC - 2000 BC The first Micronesian navigators arrive in the Marshalls, calling the atolls *Aelon Kein Ad* (our islands). Dates and origins of the settlers are still uncertain. Relatively little is known about the prehistory of the people. They are thought, like other Pacific Islanders, to have originated in Southeast Asia and to have established themselves on their scattered islands centuries before

European voyagers reached this area. Early accounts depict Marshallese society as having much in common with other Micronesian Islands, such as the Carolines. Chieftainship was strong and material culture, given the paucity of natural resources, was relatively advanced. Early Marshallese were regarded as superb canoe builders.

1494 The Treaty of Tordesillas cedes ownership of all of Micronesia to Spain.

1527 Three ships under Alvaro de Saavedra, sent from Mexico to seek news in the Moluccas of the Magellan and Loaisa expeditions are among the Marshalls (Sharp 1960, Levesque 1992a).

1528 1 January 1528 Saavedra sights Rongelap, a landing was made (Sharp 1960, Levesque 1992a).

1767 On 3 September Captain Samuel Wallis of the British ship *Dolphin*, chances on Rongerik and Rongelap while sailing northward to reach Tinian in the Marianas (Sharp 1960).

1788 The *Scarborough* (Captain John Marshall) and *Charlotte* (Captain Thomas Gilbert) sight Mili, Arno, Majuro, Aur, Maloelap, Erikub and Wotje Atolls while proceeding to China from Botany Bay. The name Marshall Islands is later applied to the group as a whole by Russian hydrographer A. J. Krusenstern (Sharp 1960).

1820 American whalers seeking food and water begin visiting the Marshall Islands. Some of these occasionally leave men ashore who become beachcombers and, later, traders (Hezel 1983).

1823 *Irooj* Lomade Juen, of the clan Rimwejoor, conquered all the islands of the Ratak and ultimately conquered Kwajalein, Lae, Ujae, Wotho, Rongelap, Bikini, Eniwetak, and Ujelang in the Ralik (Kramer and Neverman 1938, RMI Ministry of Education1996).

1825 On 7 October the Russian sloop *Predpriatie*, commanded by Lt. Otto von Kotzebue on his second expedition sights Rongelap, which he names *Rimski-Korsakoff* Island (Sharp 1960).

1835 October the American whaler ship, *Awashonks* visits Rongelap (Hezel 1979).

1840 Kaibuke had become the second-highest chief after he married the daughter of the paramount chief. Kaibuke was feared on account of his attacks on foreign ships. He attacked **Kili** and Jaluit and brought them under his rule (Kramer and Nevermann 1938).

1841 On 5 May the US warships- *Peacock* and schooner *Flying Fish*, both belonging to a US Exploring Expedition under Captain Wilkes sighted Rongelap and surveyed the southwest side of the reef (Kramer and Neverman 1938, Hezel 1979).

1842 Kaiboke Lobadeo of Ebon assumes power as the *Iroojlaplap* of the southern part of the Ralik chain (Kramer and Nevermann 1938, RMI Ministry of Education 1996).

1851 70 people of Ebon (including Kaiboke's brother) are killed when an American whaleship fires at their canoes in revenge for a trader's murder. Kaiboke swears to kill all whites in revenge for his brother's murder by the whalers (Erdland 1914).

1852 December 31, the British man-of-war *HMS Serpent* commanded by L.U. Hammett landed on Rongelap on passage from Hong Kong to search for the whaleship *Waverly* (Hezel 1979).

1857 Rev. Hiram Bingham, Jr. of the American Board of Commissioners for Foreign Missions (ABCFM) creates missionary outpost on Ebon. Kaiboke supports their work (Hezel 1983).

1860s American and Hawaiian Protestant missionaries arrive, sent by the Hawaiian Evangelical Association, an auxiliary of the American Board of Commissioners for Foreign Missions. About this time, J. C. Godeffroy und Sohn, of Samoa, establishes trading stations on Mili, Aur, Jaluit, Ebon and Namorik. A few years later, two other German companies, Hernsheim & Co. and A. Capelle & Co., are also in business there. Copra is their principal interest (Hezel 1983).

1863 Kaiboke dies of typhoid fever (Kramer and Nevermann 1938).

1869 The schooner *Franz* which belonged to J.C. Godeffroy & Sons of Hamburg, the Samoa-based firm was plundered and burned on Rongelap in 1869. Kabua played an active part (Kramer and Nevermann 1938).

1870 After Kaiboke death, Kabua (Lebon) a *leadakkad* of Rongelap, becomes *Irooj* when he marries Limokoa, the widow of the Kaiboke of Ebon (Kramer and Neverman 1938, Erdland 1914).

1870 Kaibuke was *Iroojlaplap* (Kramer and Nevermann 1938).

1876 Loeak and Kabua fight about who should be *Iroojlaplap*. Loeak chases Kabua from Ebon (Kramer and Nevermann 1938).

1878 Germany enters into a treaty with inhabitants of the Ralik chain, granting special trade privileges. Kabua (Lebon) presents himself to the German government as the *Iroojlaplap*. Kabua, Lagajimi, Nelu, Loeak and Launa all sign the treaty (Kramer and Nevermann 1938)

1880s Rongelap was inhabited by 80 Marshallese, but at the end of the 1880s Witt found only 10 inhabitants, although he found abandoned huts for a hundred. The majority of the Marshallese had been driven south while on a common canoe voyage and had perished (Finsch 1893).

1880 Loeak goes to Jaluit from Ebon to challenge Kabua in battle. After a bloodless fight, Loeak returns to Ebon (Kramer and Nevermann 1938).

1885 Under mediation of Pope Leo XIII, German government annexes the Marshalls.

1886 By agreement with Great Britain, the Marshall Islands became a German protectorate.

1887 Germans form the Jaluit Company (Jaluit *Gesellschaft)*, an entity entrusted with governance of the Marshalls. It buys out two foreign competitors based in San Francisco and Auckland. However, Burns, Philp & Co. of Sydney, which has been trading in the group for some years, continues to do so and remains until World War I (Hezel 1995).

1893 The Jaluit Company operates trading stations on Namorik, Kili, Likiep, Ailuk, Mejit, and Rongelap. The island of Kili is now the property of the Jaluit Company, which has laid out coconut plantations (Langhans 1898).

1912 A Jaluit company subsidiary known as the Marshalls Plantation Syndicate offers to buy Bikini, Rongelap, Aliningai, and Wotho, but the *Irooj* demands three times what the syndicate was prepared to pay. Nothing ever came of the syndicate or of its attempt to buy the islands as plantation lands (Hezel 1995).

1914 The Marshalls are captured from Germany by Japan.

1920 Marshall Islands are mandated to Japan by the League of Nations, together with the other occupied islands. The group is administered as a separate district. The Marshallese are given little voice in their own government, but the copra industry is left in their hands. But copra has to be exported to Japan at a price fixed by the Japanese (Hezel 1995).

1921 The Japanese take over the copra industry from the Germans, replacing the Jaluit *Gesellschaft* with *Nanyo Boeki Kaisha* (Peattie 1988).

1934 Japan withdraws from the League, but retains possession of the Marshalls. Fortification of the Marshall Islands begins as Japan prepares for war. The Japanese military begins building airstrips, power plants, and bunkers on Wotje, Eniwetak, Jaluit, Milli, Maloelap, and Kwajalein (Peattie 1988).

1939 World War II begins in Europe.

1944 10 February, 9 B-24s from Abemama Island, are sent to bomb a weather and radio station on Rongelap Island, abort due to a fuel leak in the lead B-24 (Smith 1955, Office of Air Force History 1973).

1944 19 January, planes from the Saratoga struck at Wotje, Taroa, Utirik, and Rongelap (Smith 1955, Office of Air Force History 1973).

1944 2 February, B-24s from Tarawa Atoll, Gilbert Islands bomb Rongelap Island (Smith 1955, Office of Air Force History 1973).

1944 28 March, A single B-24 from Kwajalein Atoll, en route to Enewetak Atoll, bombs Rongelap Atoll (Smith 1955, Office of Air Force History 1973).

1944 5 April, U. S. landing on Rongelap found it to be unoccupied (Smith 1955, Office of Air Force History 1973).

1945 End of World War II grants effective control of the Marshalls to the U.S.

1946 U.S. begins its nuclear testing program in the Marshalls. Bikini atoll is evacuated to Rongerik for first tests under Operation Crossroads.

1946 Residents of Eniwetak are temporarily moved to Meck Island in Kwajalein Atoll and Rongelap. The Rongelap and Wotho people are moved to Lae Atoll for the duration of the Bikini tests (Deines et al. 1990).

1951 US Department of the Interior assumes responsibility within US Government for the TTPI from the Department of the Navy.

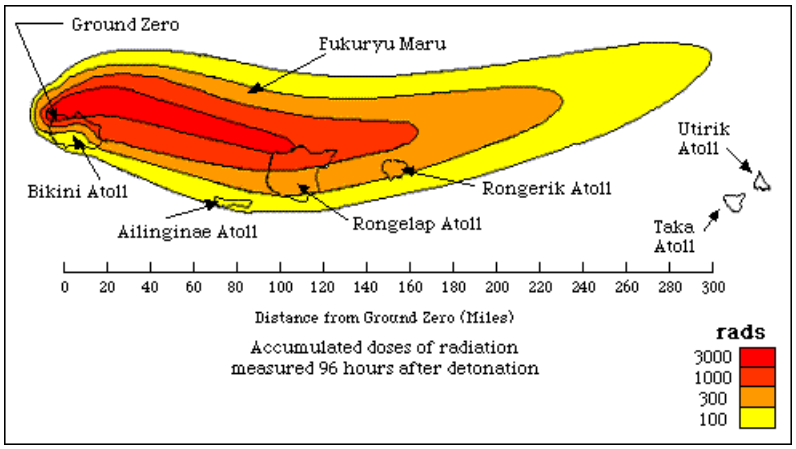
1952 The first hydrogen device (Operation Ivy) under the US testing program in the Marshalls is fired on Eniwetak on 1 March. The Eniwetak people who live on Ujelang temporarily stay on a U.S. Navy ship. The ship takes them to a point 100 miles farther away from Eniwetak (Deines et al. 1990).

1954 US nuclear testing program detonates Bravo, the most powerful hydrogen bomb ever tested by the U.S., on Bikini atoll. Radiation from the test forces evacuation of Marshallese and U.S. Military personnel on Rongelap, Rongerik, Utirik and Ailinginae (Deines et al. 1990).

1954 February 28 On the eve of the Bravo test, weather reports indicate there are "less favorable winds which were headed for Rongelap to the east (Deines et al. 1990).

1954 1 March, Despite weather reports the Bravo hydrogen bomb test is detonated at Bikini. Within hours a gritty, white ash is enveloping islanders on Rongelap and Ailinginae Atolls (Deines et al. 1990).

1954 3 March, Rongelapese are evacuated 48 hours after Bravo and are taken to Kwajalein for observation. Skin burns on the heavily exposed people begin to develop, and later their hair falls out (Deines et al. 1990).



1954 Rongelapese who received fallout from the Bravo test experience severe health symptoms of vomiting, itching skin, nausea, and diarrhea (Deines et al. 1990).

1955 (until 1958) Rongelap women experience more than twice as many stillbirths and miscarriages as other Marshallese women (Deines et al. 1990).

1957 Rongelap is declared safe for rehabitation. The Rongelapese, are allowed to return to their island.

1959 American scientist warn Rongelapese not to eat coconut crabs because of high radiation levels (Deines et al. 1990).

1965 The Congress of Micronesia is formed, with representatives from all of the TTPI islands. It is created by the U.S. administration in preparation for greater self-governance by Micronesians.

1967 Eniwetak people on Ujelang experience sever problems, such as inadequate food supply, lack of materials for repairs, and rats destroying the copra (RMI Ministry of Education 1996).

1979 Amata Kabua is selected as the first president of the Marshall Islands.

1979 Government of the Marshall Islands officially established, and country becomes self-governing.

1982 Official name changed to the Republic of the Marshall Islands (RMI).

1983 Amata Kabua selected second time as president.

1983 Voters in the RMI approve the Compact of Free Association with the United States.

1985 In order to relocate the Rongelapese sought help from Greenpeace. They were evacuated to Mejato Island on Kwajalein Atoll by the Rainbow Warrior on its last voyage prior to being sunk by the French government (RMI Ministry of Education 1996).

1986 U.S. Congress approves the Compact, resulting in its entry into force. The Compact grants the RMI its sovereignty and provides for aid and US defense of the islands in exchange for continued US military use of the missile testing range at Kwajalein Atoll.

1987 In third election, Amata Kabua is selected as president.

1990s Settlement of compensation claims as a result of the US nuclear testing in the Marshalls still proceeds, and is associated with various agreements being made as part of the Compact of Free Association package. There are also outstanding court cases. Almost 5000 Islanders had sought compensation from the Nuclear Claims Tribunal and, up to September 1993, some 380 had been granted compensation totaling about $14 million, only a quarter of which had been paid (Deines et al. 1990).

1990 UN Security Council terminates the RMI's Trusteeship status.

1991 In fourth election, Amata Kabua is selected as president.

1991 RMI joins the United Nations.

1994 The U.S. Department of Energy begins releasing thousands of previously classified nuclear test era documents, many of which confirm the wider extent of the fallout contamination in the Marshall Islands.

1994 Iroojlaplap Kabua Kabua of the Ralik Chain passes away.

1996 Amata Kabua dies.

1996 In fifth election, Amata Kabua is selected as president.

1997 Imata Kabua selected to finish the late Amata Kabua's term.

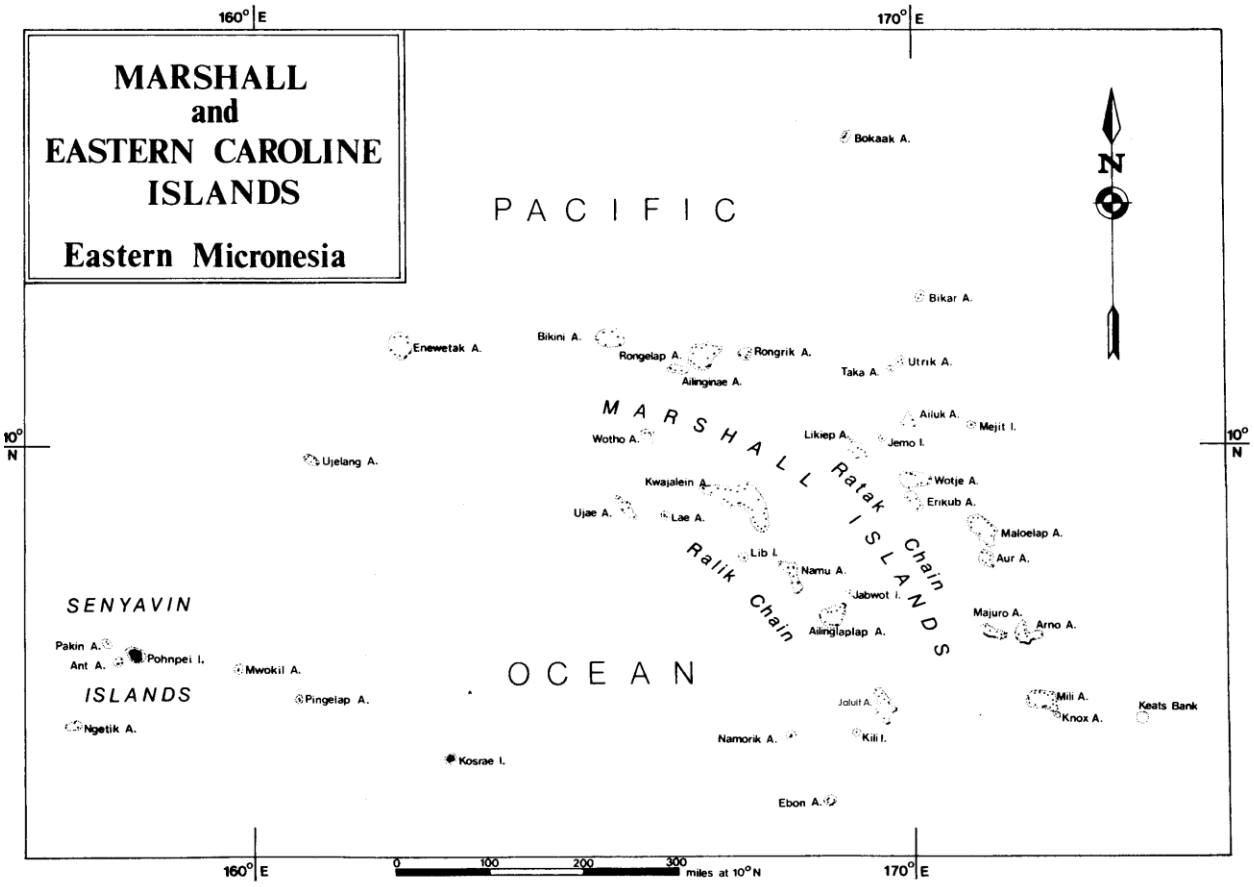
2000 Kessai Hesa Note selected as president.

2001 Current Compact of Free Association expires.

II. Environmental Settings

2.1 Physiographic and Biological Setting

Located in the central Pacific between 4° and 14° north latitude and 160° and 173° east longitude, the Republic of the Marshall Islands consists of 29 low-lying coral atolls and five independent coral islands (Map 1). Twenty-two of the atolls and four of the islands 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; together they extend about 700 miles (1130 km) north to south and approximately 800 miles (1290 km) east to west. Isolated by ocean, the Republic is more than 2,000 miles (3230 km) from the nearest trading centers, Honolulu and Tokyo. It's nearest neighbors are Kiribati to the south and the Federated States of Micronesia to the west.



Map 1. Republic of the Marshall Islands

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 70 square miles (110 square kilometers), a mean height above sea level of about 7 feet (2 meters) above sea level, and soils which are nutrient poor, the nation's agricultural base is limited. The marine resource base is extensive, however. The combined lagoon area totals 4,037 square miles

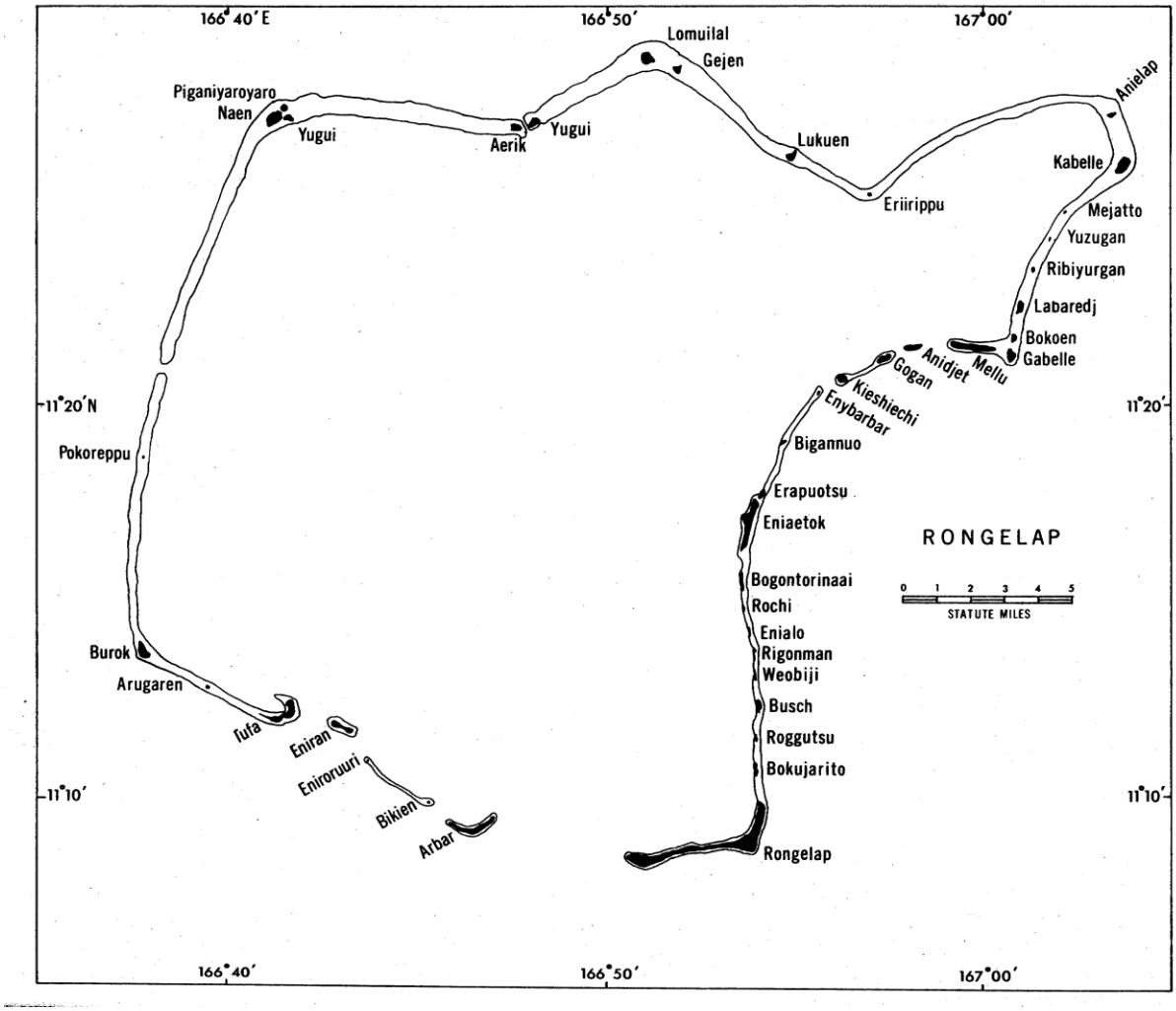
(6511 square km). Coral reefs fringe the atolls and serve as the only defense against the ocean surge. The clearance over the reef in the sections that are covered by water is usually no more than a couple of feet (Permanent Mission of the Republic of the Marshall Islands to the United Nations, 1992).

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 foot (45 m) average depth. The surrounding ocean depth plunges to over 5,000 feet (1525 m)within two miles (3 km), and to 10,000 feet (3050 m) within ten miles (16 km) of the typical atoll (Fosberg 1990; Wiens 1962).

Dye (1987) 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).

Underwater 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 Arno 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 (Spennemann 1993).

Rongelap Atoll is part of the Ralik Group of the archipelago of the Marshall Islands. It is located 11^{o} 5' north latitude and 166^{o} 75' east longitude. The atoll contains approximately 61 islets, scattered on the north, southwest, and south reefs, and one tiny islet in the middle of the west reef. It has a land area of 3.07 square miles and the reef encloses an area of 387.77 square miles (Map 2).



Map 2. Rongelap Atoll.

2.2 Climate

The climate of the Marshall Islands is predominately a trade-wind climate with the trade winds 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 are easily subject to flooding during storms. Tropical storms are rare but do occur. Around 1850 a great typhoon hit Rongelap and killed the inhabitants(Kramer and Nevermann 1938) and left the atoll with a considerable amount of environmental damage. Typhoon Rita hit the area in October of 1978 (Spennemen and Marschner 1994-2000).

The only atoll for which complete weather data exists is Majuro, where a U.S. National Oceanic and Atmospheric Administration Weather Station is located. Annual rainfall varies considerably from north to south; the southern atolls receiving 120-170

inches (300-430 cm), and the northern atolls receiving 40-70 inches (100-175 cm) (NOAA 1989) The highest rainfall generally occurs during the *Anon Rak* season, also known the breadfruit season (June to October). Precipitation is generally of the shower type; however, continuous rain is not uncommon. During the *Anon 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 recorded 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 1 degree Fahrenheit. Nighttime temperatures are generally 2-4 degrees warmer than the average daily minimum because lowest temperatures usually occur during heavy showers in the daytime. In spite of this, the weather is always hot and humid with the average temperature of 81 degrees Fahrenheit all year around (Permanent Mission of the Republic of the Marshall Islands to the United Nations, 1992).

2.3 Vegetation

There is no written record of the original vegetation of the Marshall Islands. The precise date when plants first occur in the Marshall Island atolls is still debated (Dye 1987). It is possible that 44 species of plants, including various herbaceous species, shrubs, and trees, migrated to the southern Marshalls before the advent of man (Hatheway 1953). The early inhabitants probably altered the vegetation of the atolls by introducing new species. During the twentieth century, coconut plantations developed by the German, Japanese, and American administrations replaced most of the original vegetation of many atolls (Fosberg 1990). Today as much as 60 per cent of the nation's land area is covered with coconut (*Cocos nucifera*) (OPS 1991).

Many areas not dedicated to coconut plantations have been put to other uses such as cultivation of taro and other plants. Species which have been adopted are pioneer species reliant on the presence of humans for propagation (Fosberg 1990)

The vegetation that grows on 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, Suriana maritama, Pemphis acidula, Tournefortia*); and a layer of ground cover consisting of several species (*Lepturus repens, Thuarea involuta, Fimbristylis cymosa, Polypodium scoloprendria*). Several mono-specific forests occur in the Marshall Islands (*Neisosperma, Pisonia grandis, Tournefortia argentea*) (Fosberg 1990). Shrubs such as *Pemphis acidula, Suriana maritama*, and *Scaevola sericea* typically grow along shorelines while herbaceous plants occur mainly under forests. Limited strands of mangroves (*Bruguiera*) are found in swampy areas containing brackish water on several of the larger islands of the wet southern atolls (Stemmerman 1981). Cultivated plants (*Musa, Cocos nucifera*,

Artocarpus altilus, *Cyrtosperma chamisonnis*, *Pandanus tectoris*) are commonly found on the inhabited islets of the Marshalls. These various plants serve as wind breakers, salt spray repellents, food, and are used by locals for weaving and medicinal purposes.

Rongelap vegetation was seriously affected by fallout from the Bravo shot of 1954. A large part of Rongelap Islet is mixed forest and scrub. In places pure there is *Pisonia*, other *Guettarda*, *Tournefortia*, and *Scaevola* scrub.

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 an approximate 1.3 inch to 3 inch 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 Marshalls is 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 the littoral shrubland along the coastline is visibly eroded. and most of the vegetation growing in this area will soon be washed away by the incoming tide. 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 climate change. As the Marshall Islands lie in open ocean, the islands 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*" (gifts from god). The sense that Marshall Islands are a god-given sanctuary away from the harshness of other areas is therefore part of the sociocultural identity of the people. When any variation in the weather hits the Marshall Islands, the effects can be severe. When Typhoon Paka passed through Ailinglaplap in late 1997, food crops were severely hard hit and outside food had to be brought. The El Niño induced drought that followed caused the entire Marshall Islands to be declared disaster areas, and emergency water making equipment and food supplies were shipped in from the outsider.

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 a "front line state" with regard to the climate change issue. 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 (Permanent Mission of the Republic of the Marshall Islands to the United Nations, 1992).

III. Land Tenure

Land is the most highly prized possession in the Marshall Islands therefore control of land is the central most theme of Marshallese culture. With slightly less than 70 square miles of land in the entire archipelago and prime settlement areas being extremely limited, land has long been highly valued.

Marshallese society is composed of a number of matrilineal clans (*jowi*). The most important descent group is the lineage (*bwij*). The *Bwij* is the 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 a *jowi* (clan). The lineage head (*alab*) is steward of the lineage land holdings. The majority of land is matrilineally inherited, *bwij* members tracing descent from a common *Alap* ancestress (Tobin 1958).

The basic land division of the Marshall Islands is composed of sections of varying width which run from ocean to lagoon. These ownership parcels, called *wetos*, are usually two to five acres in area. The *wetos* are held communally and administered by matrilineal lineage (*bwij*) members who traditionally cleared and tended the land for subsistence agriculture. Social position is derived according to both present and future land ownership rights.

Title is divided and shared by several levels of the society. Typically, each member of the *bwij* holds one of four recognized social positions with respect to the *weto*, being either the *iroojlaplap* (paramount chief of certain lands), the *iroojedrik* (lesser chief of certain lands), the *alap* (person with immediate management responsibility for the land), or *drijerbal* (worker on land).

The *Irooj* (chiefs) hold title over an island or atoll. The *alab* organized and directed lineage activities and allotted lands for use to different descent lines within the lineage. The *alab* and the *drijerbal* (workers) make up the subjects or *kajur* (commoners) and render services to the *Irooj* in exchange for land use. The *Irooj* managed the land in a way that not only provided them food but also provided for the *kajur* (*alaps* and *drijerbals*). The k*ajur* in return cultivated the land, harvested the waters surrounding the atoll, and performed *ekkan* (tributes) to the chiefs. The procedure is a cycle that has been repeating for hundreds of years. The common members of a lineage have land rights, although the *alab* and *drijerbal* change land ownership. The *Irooj* is the only individual with permanent land rights, unless defeated in war (Tobin 1952)

Historically an *Irooj* was able to extend his control over most of the Ralik (except Eniwetak 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* (paramount chief) he rarely visited those further north than Kwajalein and Ujae because they were isolated and somewhat impoverished (Alikire 1977). 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 alliances were unstable and varied in size as local *Irooj* tested the strength of their islands against that of the *Iroojlaplap*. This trend toward instability encouraged the *Iroojlaplap* to move his residence from island to island to make his control clearly evident to the local *Irooj*.

Traditional rights of land tenure are unequivocally preserved in the Constitution, and the traditional requirement of consensus decision making, in which all persons with land rights to a certain *weto* must agree on questions of land transfer is retained.

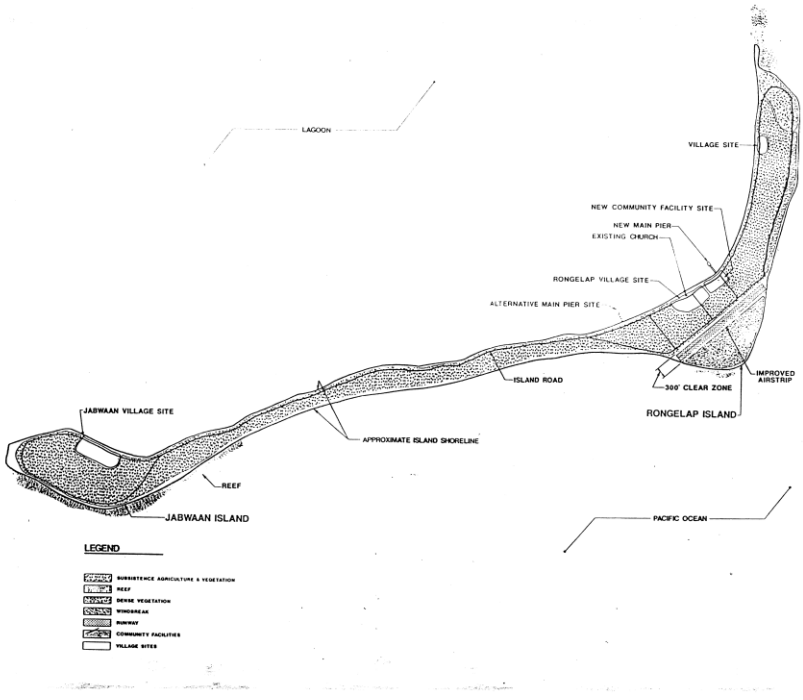
The traditional land tenure system confounds Western-style efforts of historic preservation. Landowners are accustomed to exercising ultimate control over land use and access, and are therefore generally unaccepting of regulations that might restrict the usage of their property.

IV Field Investigation

4.1 Introductory Remarks

A total of ten historic sites were identified and recorded on Rongelap Atoll (Map 2). No prehistoric or traditional sites were identified due to the nature of the investigations. The field trip took place from July 24 to August 3, 1998, with the actual investigations occurring July 27 – 31, 1998. The remainder of the time was spent traveling to the atoll by boat from the capital atoll of Majuro. Although the Historic Preservation Office had identified Rongelap Atoll to be surveyed, the survey was pushed up to an earlier schedule than had planned.

In 1985 the people of Rongelap Atoll were evacuated by the environmental organization Green Peace due to continued harmful radiation left by the U.S. nuclear testing program "Operation Crossroads." The entire atoll had been deserted since that time and no commercial air or sea service operated into Rongelap. In July of 1998 the Majuro based firm Pacific International, Incorporated was to begin a resettlement construction program (Map 3). The HPO staff accompanied that crew and was limited to time spent according to the schedule of the boat that was delivering equipment. As there was no local population on the atoll, the usual HPO method of hiring local guides and informants to assist in identifying historic and traditional sites could not be employed. Therefore, only readily visible sites were identified in the abbreviated reconnaissance survey. In addition, as no small boat was available to visit other islands within the atoll, only Rongelap Island was surveyed. However, as only Rongelap Island was scheduled for construction, a more complete survey of the other islands can be made at a latter time.

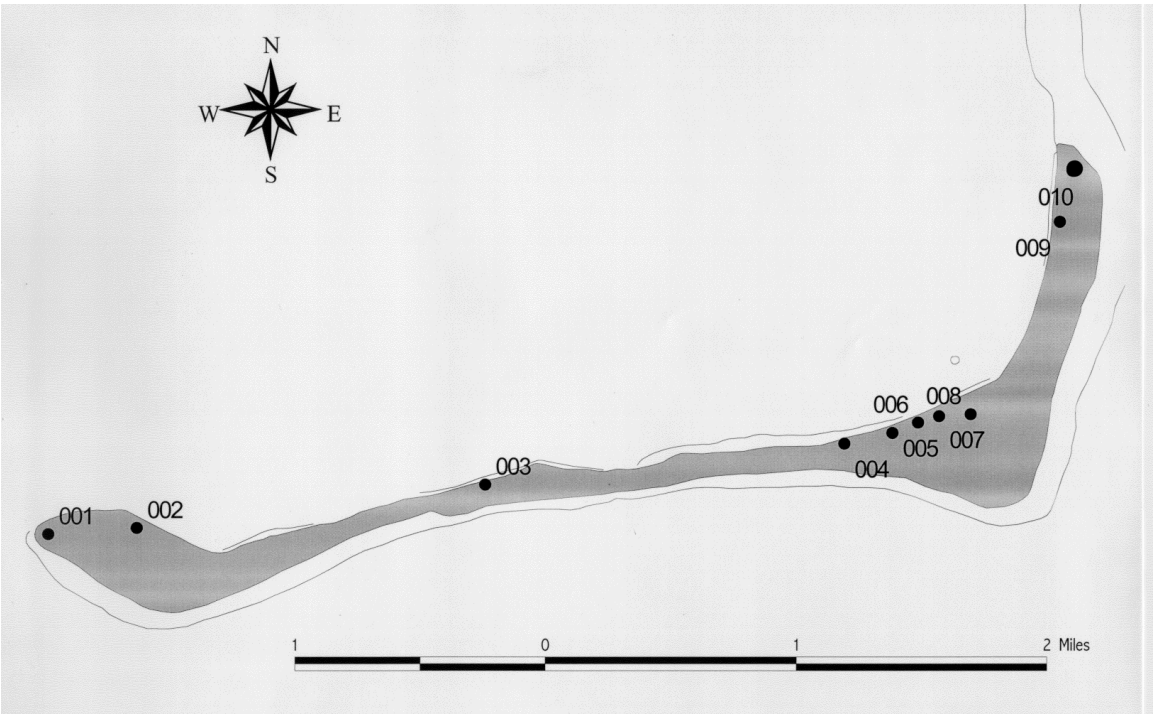


Map 3. Rongelap Construction Map.

Given the nature of the survey, many of the "historic" properties identified may not actually be historic by the RMI definition of 40 years of age. Instead, the sites were identified due to their importance associated with the abandonment of the atoll that was forced due to historic circumstances of the nuclear testing program. While most of the sites may not be 40 years of age, the HPO still considers them significant in the history of the atoll.

4.2 Rongelap Island

Ten sites were identified on Rongelap Island (Map 4).



Map 4. Sites identified on Rongelap Island.

Site MI-RN-RN-001 (Marshall Islands-Rongelap Atoll-Rongelap Island-Site001)

N 011° 09' 13.29"
E 166° 50' 15.11"

This site consists of three house foundations with a cookhouse (Photo 1). The site is located on the west end of the island. It appears to be a household compound outside the main village that was located in the center of the island. Household debris was strewn throughout the area. The extent of the site is approximately 50x50 meters. The site was abandoned during the evacuation of 1985. Although the site is not 40 years old, its significance lies with the historical actions that are over 40 years old.

Photo 1. Site MI-RN-RN-001.

Site MI-RN-RN-002

N 011° 09' 25.73"
E 166° 52' 01.01"

This site is the location of the abandoned Jabwaan village (Map 3). Several collapsed houses and cookhouses make up the village (Photo 2). Household debris was strewn throughout the area. The site was abandoned during the evacuation of 1985. Although the site is not 40 years old, its significance lies with the historical actions that are over 40 years old. The extent of the site is approximately 100x80 meters.

Photo 2. Site MI-RN-RN-002, house located at Jabwaan Village.

Site MI-RN-RN-003

N 011° 09' 29.81"
E 166° 52' 40.42"

Another abandoned house compound west of the main village. This site consists of one small house, a rusted truck (Photo 3), and a chicken coup (Photo 4). The extent of the site is approximately 30x30 meters. The site was abandoned during the evacuation of 1985. Although the site is not 40 years old, its significance lies with the historical actions that are over 40 years old.

Photo 3. Site MI-RN-RN-003, rusted truck.

Photo 4. Site MI-RN-RN-003, chicken Coup.

Site MI-RN-RN-004

N 011° 09' 33.84"
E 166° 53' 10.62"

Another abandoned house compound on the west end of the main village. This site consists of several houses and a nearby cemetery plot associated with the houses (Photo 5). The extent of the site is approximately 150x100 meters. While the houses are not 40 years old, the graves appear to be historic.

Photo 5. Graves from Site MI-RN-RN-004.

Site MI-RN-RN-005

N 011° 09' 36.20"
E 166° 53' 15.32"

Abandoned house near church. Another abandoned house compound west of the main village. This site consists of several small houses (Photo 6). The extent of the site is approximately 50x50 meters. The site was abandoned during the evacuation of 1985. Although the site is not 40 years old, its significance lies with the historical actions that are over 40 years old.

Photo 6. Site MI-RN-RN-005.

Site MI-RN-RN-006

N 011° 09' 38.45"
E 166° 53' 21.64"

Church. This is the site of the island's abandoned church (Photo 7). The exterior of the church has survived quite well. The interior (Photo 8) roof has begun to collapse, but the objects inside have survived. The HPO would suggest that the church be restored and possibly used as a museum for the events that caused its abandonment.

Photo 7. Site MI-RN-RN-006, church exterior.

Photo 8. Site MI-RN-RN-006, church interior.

Site MI-RN-RN-007

N 011° 09' 40.71"
E 166° 53' 27.58"

Cemetary. This cemetery (Photo 9) is associated with the church. Without headstones, it is impossible to identify if any of the burials are historic. It measures 30X30 meters.

Photo 9. Site MI-RN-RN-007, church cemetery.

Site MI-RN-RN-008

N 011° 09' 45.90"
E 166° 53' 34.99"

Collapsed house near base camp. Like many of the other houses on the island, this one is in total disrepair (Photo 10).

Photo 10. Site MI-RN-RN-008.

Site MI-RN-RN-009

N 011° 10' 11.02"
E 166° 53' 44.57"

Village marked on Construction map. This village consists of several houses, one of which is in the process of falling over (Photo 11). It would be a good example of how the abandonment of the island has caused repairs to go undone.

Photo 11. Site MI-RN-RN-009.

Site MI-RN-RN-010

N 011° 10' 24.47"
E 166° 53' 45.28"

Village. This house was obviously in the stages of construction when the island was abandoned (Photo 12). It is a good example of the work left undone due to evacuation.

Photo 12. Site MI-RN-RN-010.

V. Management Plan

Cultural Resource Management (CRM) in the Republic of the Marshall Islands, while becoming an important part of archaeological work, is still in its infancy. CRM is based on the realization that cultural resources, are nonrenewable and that prudent care must be taken to utilize these resources efficiently. While the immediate goal of the HPO survey was to identify the historic sites of Rongelap Atoll, the long-term goal should be the education of the local and national population on the importance of preservation of these sites. While the Historic Preservation Legislation of 1992 has codified CRM into law, the cultural traditions of the Marshall Islands, namely the importance of land rights to individual landowners, makes the practice of CRM difficult to legislate. And while the Act has established that developers are responsible for the costs involved in conducting archaeological investigations prior to the commencement of construction, there is no precedent case for developers being prosecuted due to violations of that law. Therefore, education is still the most important tool that the HPO can use in site management and preservation.

Unfortunately, the situation at Rongelap is unique. As stated in the Introduction, the Historic Preservation Office conducted the survey of Rongelap Island in response to the initial construction associated with the resettlement of Rongelap Atoll. Before this resettlement can occur, the islands must be made safe for human habitation. At the time of this writing is not known how the islands of Rongelap will be made free of radiation before resettlement begins. The two possibilities are scraping the entire island of the top layer of coral or spreading the element potassium throughout the island. If the former occurs all prehistoric and historic sites will be destroyed.

Given the limitations of the survey, no prehistoric or traditional sites were identified. This is an obvious oversight that must be corrected before intense construction or scraping of the island begins.

5.1 Long range recommendations

The historic sites on Rongelap Atoll are valuable resources. As such, they warrant an active preservation effort. Primary concern must be the stabilization of the sites (see short-range recommendations). After successful completion of the physical preservation of archaeological remains, further use of these resources has to be planned. The best move for the HPO seems to be raising public awareness and to actively involve local governments in their preservation efforts. Those preservation efforts should also be directed towards possible sources of income for outer island residents through tourism. Sites that have potential tourist possibilities should to be selected for restoration and possibly reconstruction. The following sites should be considered for restoration:

Site MI-RN-RN-006: The Church.
Site MI-RN-RN-009: Partially collapsed house

The whole landmass of Rongelap Island is an excellent showcase of the horrors of the U.S. nuclear testing program. Partial restoration or simple clearing of the sites and footpaths would allow tourists to visit actual sites associated with the evacuation of Rongelap. Guided tours and handouts would generate the revenue needed to restore more sites and yield potential employment for local residents. Site MI-RN-RN-006, properly stabilized, would allow tourists to visit a local church that lost its congregation due to evacuation. A tourism management plan for Rongelap seems to be a valuable investment for the future. It might be added that the recovery of data, as well as the preservation and possible restoration of historic sites, serves little purpose if the results of this work are not disseminated to the general public. Some of the ways through which this information can be disseminated include training local guides and the production of handouts. Exhibitions, public lectures, and publications should also be considered.

5.2 Short range recommendations

The primary goal of every preservation action should be the proper stabilization of sites being threatened by natural forces or human impact. This is especially true for sites that have been determined to be of significance to Marshallese history. Again, given the nature of events at Rongelap, it is up to the people of the atoll to determine if they wish to preserve the sites that were associated with the atrocities of Operation Crossroads. Also, as no prehistoric or traditional sites were recorded, a more intense survey with limited excavations may be in order before the island is either scraped or major construction occurs. At that point, all sites determined "significant" have to be included in the RMI National Register of Historic Places.

VI. Summary and Conclusions

As mentioned in the introduction, the objectives of the present project were very clear and focused on site survey and inventory and education. The present work at the HPO is focusing on surveys of all the atolls within the Republic in order to produce a complete site inventory and National Register. Unfortunately, given the limitations of the survey, no prehistoric or traditional sites were identified. This is an obvious oversight that must be corrected before intense construction begins when permanent habitation of the atoll occurs.

Part I of this report discussed the project's research design, scope of work, and methodology. It also included a section on previous work and the history of the Marshall Islands and Rongelap Atoll.

Part II described the environmental setting of Rongelap. Typhoons can drastically alter the landscape of low-lying atolls in the Pacific. Sea level changes pose additional threats to atoll environments. It is predicted that the global warming trend will have a tremendous impact on atoll communities within the next century. Information provided on vegetation and soil types was not only used as necessary background information in order to complete RMI National Register Forms, but also provided clues to the likelihood of areas primarily used for agriculture.

Part III discussed land tenure and subsistence strategies. This is important for evaluating the significance of sites concerning their standing in time and space. How certain areas may provide a better chance of recovering subsurface material in future intensive excavations.

Part IV reported the results of the field investigations. A total of 10historic sites have been recorded. All were located on Rongelap Island.

Part V listed possible long-term and short-term management plans for the preservation of the sites on Rongelap. As the history of Rongelap is unique to any other atoll in the Marshall Islands, all sites should be considered significant.

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Appendix 1: Traditional Histories

Prior to the introduction of a written language, Marshallese cultural was largely 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.

The themes of Marshallese stories are universal: good versus evil; heroism and success of the underdog; the repercussions for children of disobedience; family respect; and sibling and peer rivalry. They are flavored with demons, ghosts, giants, and personified fish and animals. Supportable historical fact is often combined with mythology in the same story.

There is a growing awareness among the Marshallese people of the important roles their oral traditions play in preserving Marshallese cultural identity. In all of the stories, morality prevails, and acceptable behavior and traits of character are exemplified so that they may be passed on from old to young, past to present, and hopefully from generation to generation.

There are many variations in the creation accounts. Regardless, the different versions introduce key characters import to Marshallese cosmology.

According to Erdland's sources the Ralik version of creation begins with 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 the reef formation appeared. The 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, a 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: Irojrilik, in the west); (LoKomraan) Lakameran (Daymaker) in the east; (Lorak) Rerek in the south, Lajiminanmen (Lajbuineamuen or Lalikian) in the north.

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

Wulleb and his sister's children sat down one day on a stalk of an arrowroot. Which, growing up to the vault of the sky, 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 sighed aloud as the result of his fall, Iroijrilik awoke, came to him and spoke: 'Well, this is Wulleb, and he has fallen from the sky!' Wulleb answered: 'My

nephews and I watched one another by night; then when my retina tore, I fell down.' Iroijrilik then spoke, 'Let us go into the hut'. They went into it and three months passed.

When Wulleb had spent some time with Iroijrilik, a large and extremely painful boil developed on the extensor side of his leg. After it became ripe it broke open, two little boys issued from it, the elder of whom was called Jemeliwut, and the younger Edao.

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

According to Reymond (1899) in Das Weltall, the Ratak version of creation starts with two serpents (or worms), the male was called Wulleb and and the female, Lejman (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 oceans.

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 (tidalwave) and Ni (coconut).

Then Wullip collected in a coconut shell the blood from a cut on his leg, and from this blood came Etao (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 inhabited (studded with stars) by far than the Southern Hemisphere. A bird flew to tell one of the sky gods their plans to defeat their brothers. This god captured Edao's small son, set him impossible tasks, which the son accomplished, then lowering himself to earth on a thread. Edao had settled on Mejit. Bikar was formed by a rock with Etao threw at the bird which had come to spy on him.

For clarification, from the Ralik chain the cosmological genealogy is as follows:

Lowa

Wulleb Limdunanij

Jemaliwut Edao Lanej Lewoj

From the Ratak chain the cosmogonic genealogy is as follows:

Wulleb Lejman

Jemaliwut Edao Lanej Lewoj Lino Ni

Other accounts add information, some contradictory. According to Knappe the frist 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 Edao and Jemeliut. Edao 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 Edao planted the land, created land and sea animals, and married his mother. Then the bird Babuk came with the female sexual organ in his beak. Etau hid it. Lejman found it and put it on. Neither wore clothes at this time but Lejman became ashamed and took two mats as covering (beginning of clothing). From there union came the first people. In this version it is Edao who is credited with creating the animals and plants. According to Knappe (1888) the woman wasn't ashamed at her nakedness but because she had an incestuous relationship with her son.

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 and became Kili.

In several versions Lowa sent two men to tattoo (on Ailinglaplap) all the living creatures', thus giving them colors and markings (Davenport 1953, Chambers 1969, Buckingham 1949). Lowa sent two men down to Bikini with measurements for the first canoe (Buckingham 1949, Davenport 1953). 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 and flew into the air with the rope making a net and widening and raising the sky, holding it up. Rain is water separated into drops falling through the net (Kramer and Neverman 1938, Buckingham 1949, Chambers 1969) Everyone went to Namu to honor Liwatonmour, founder of the Irooj clan. From this gathering came all clans, with *Irooj* as the highest (Chambers 1969).

There are many other stories which explain the origin of the sailing canoe (Liktanur and her son's canoe race) (Kramer and Neverman 1938, Erdland 1914, Buckingham 1949, Davenport 1953), the origin of navigation (Buckingham 1949), origins of animals, breadfruit (Mackenzie 1960); taro (Bikajle 1960).

William H. Davenport (1953) writes that Rongelap (large cheeks) and Rongerik (small cheeks), got their names from the exploits of two brothers of the same name although the stories are no longer remembered. According to Kramer and Nevermann (1938) Rongelap is named from the word "grave," since there were many battles for rulership here. The Marshallese word ron is defined as 'pit' or 'hole'. . Kramer also notes a Rongelap proverb, *rong ene man*, which he translates as 'Rongelap hear island people'. . Erdland (1914) says it means "broad semicircle". In the Marshallese Dictionary, 'ron' is a hoop made of wood for a flying fish net. An informant on Rongrik said that Rongelap was the woman's name who created the islands (Kramer and Neverman 1938).

The names Rongelap and Rongerik appear also in the central Carolines as the hero brothers and are translated as Big Cheeks and Little Cheeks. Rongerik had magic which he used most often to save his brother, who was constantly lost. These brothers

are related, in part, to stories of Longorik and Longolap from Ifaluk. Their father, Aluluei, gave them lessons in navigation and sailing, but Longolap never paid much attention. In Lamotrek the set of brothers are Big Rong and Little Rong.

The language of the Marshall Islands has four different words to indicate spiritual beings: *jetob*, *anij*, *ekjab*, and *noneip*. The meanings of these are not clear. Knappe (1888) states that a *jetob* is a spirit who had existed somewhere in the universe and to whom one attributes particular supernatural qualities and abilities. An *anij* is an invisible being, which can both help and harm people. An *ekjab* is embodied in natural objects; a tree, a plant, a stone, a reef, an animal, etc. A *noneip* lives by themselves on certain islands of the Marshalls and are invisible to ordinary mortals. Both Erdland (1914) and Kramer & Nevermann (1938) recorded information concerning various Marshallese spirits. Most fall into the category of *ekjab* although there are a few *anij* as well.

1. *Lator im lajitbalal*, which translates as "the greedy one and the one who lies crosswise", are two sharks on the lagoon side of Burok, who come quite close to shore
2. *Joboklab* is a sandbank north of Burok
3. *Lamanewa*, the canoe eater, is a pointed reef jutting into the To'nKaie [?] entrance, which is dangerous for incoming canoes. Erdland also mentions a separate *Lamanewa*, known as the canoe devourer, east of Jokrik. This is perhaps the same one. This spirit could not be killed; all divination made with this in view indicated the death of anyone who battled with him; *I wadan Jobrik iewuij*, east of Jokrik divination tells of disaster" Nevertheless one man was not afraid of the spirit's fiery head, bewitched him, and ran after him until he disappeared in the sea forever. The magic formula was (the spirit was driven mad when the man shook small stones in a coconut shell): "*Kolej liklok, kolej I ar lok ijo rellulok anij eo'm kadoaklok; I na en ke? I bar en ke? (kounak ko jaunebo?), en mue anij en ke? En mue auie'n ke? En mue I jabuen Bigrik, Bigarlok, bigak o? bigak im kalok? Jorin in bit ne, wujibloke baran anij ne, jadaleke*" that is the shore runner flies from the outer shore to the lagoon shore, there where one pursues the spirit and tries to make him dive, perhaps near that heap of stones? Near that reef? And will he overthrow that sprit, that savage? Will he disappear at the end of Bigrik, Bigarlok? Will he swing himself, oh? Swing himself and jump into the sea? Thunder from that reef, break off the spirit's head and eat it on the way!"
4. *Labodemmar* is a giant shark on the reef of Jokrik, feared to such an extent that no one wades across the reef at high tide. (Erdland 1914, Kramer and Nevermann 1938).
5. *Loto*, a point of land on Aerik, where large quantities of muelmuel fish can be found (Erdland 1914).
6. *Likrilim*, a kanel tree on Ejij (Erdland 1914).
7. *Joeoner*, an ironwood bush on the north shore of the lagoon of Karoge. Here, instead of the word eoner, "to fish" *idemij* is to be said (Erdland 1914).

8. *Muaniarik*, a hill on the west shore of the lagoon of Karoge (Erdland 1914).

9. *Laniar*, a sandbank between the two islands Ene-kan-baibut-en; as a sea mark, a tropic bird. "*Komin jab laniar, emo kamar ie*, do not commit a crime with each other; cohabitation is forbidden there (Erdland 1914).

10. *Lamalinwa* (*mal*, "block as a support," *wa*, "canoe") a tree trunk on the southern outer shore of Arbar. *Kijeek im kabbuil en an Lamalinwa, jerak wa eo jabrikdak*, there is the fire of *Lamalinwa* consuming the underbrush, may the canoe sail with the sail northwards (Erdland 1914).

11. *Jobuilen*, a stone on the lagoon shore of Jabon (Erdland 1914).

12. *Lelleb*, a reef flat in the interior of Jabon (Erdland 1914).

13. *Lukojtaga*, a block of coral (Erdland 1914).

14. *Kureen*, an ironwood bush in Eniaedok, on the south shore of the lagoon(Erdland 1914).

15. Lak, the great *anij*, who lives on the island Enibarbar in a *kangal* tree. Eniaetok originated through him. A large bird, menidjebvora, lived there. He came into existence when two men cut out a bird from the trunk of a *geren* tree; they also made him hollow so that they both were able to get inside. By means of magic he lifted himself into the air, so that they were able to fly with him. One day the bird flew to the west and ate up the island Lajuar. When he wanted to eat still more, Lak prevented it by destroying his wings with stones in the air, so that he fell down upon the reef, where the island Eniaetok came into existence, shaped like a bird (Kramer and Nevermann 1938).
    Another version of this story (from Chambers 1969) A man's wife was abducted by another man, Lak. The husband made a magic bird-plane of wood and feathers, performed a magic song to make it fly, and flew looking for his wife. The bird-plane flew from island to island, and at each of them the people ran to the beach to see the strange sight. Finally the man saw his wife and landed in the bird-plane. The chief who had abducted the woman had the bird carried to his house, to be a pet. When the bird made a noise everyone went fishing for food for it. Just as the canoes are sailing the bird falls from its place. The woman tells the other women to lift the bird to its place or the chief will return and be angry about it. Together the women lift up the bird. The wife runs from the house but the man peeks out from inside the bird and pulled his wife inside with him and they flew off. The bird plane flew off with the woman and as it passed Ailinginae, a god, Lak, threw rocks at it until it flies to Rongelap. While it is in Rongelap the man throws rocks at it at a place called Ene bao (bird island). It is located at the northern tip of the island. Then the left wing broke off and made a small island. (Chambers 1969).

16. *Likamijetjeten*, the glistening stone, a flat stone on the northern end of the island Eneaedok. With his stone Lakialu (Linomeme's husband) hit a kite-

like bird, whose wings were crushed. The falling bird-kite formed the island Eniaedok which has a shape similar to that of a bird (Erdland 1914).

17. *Lijbukra*, northeast of Rongelap, a salt-water bush in which a heavy stone lies. When the natives went from Rongelap Island to the islands to the west and their laziness made the stretch back seem too long, they used to first make offerings to Lijbukra and utter the following request: *Lijbukra, Lijbukra e! lagagedak Jabwon im kaidak na i Rongelap, nuknukijdok man im e reretlok logan, Lijbukra, Lijbukra, oh*! Draw Jabon near and let it abut upon Rongelap, bend the tip and may the end vanish!"(Erdland 1914). Kramer and Nevermann (1938) record the same chant but translate it somewhat differently, "*Lijebukura, Lijebukura e, legagetat jebaoan em keitak nai Rongelap, Nukunuku to manem, Erlogelog logan."* Lijebukura, Lijebukura Ho, Brings to Jabon Puts it with Rongelap, Rolls up with the land from the end, (And) rolls it back again. Kramer describes Lijebukura as an *anij* who belonged to the circle of creators.
Another story states that Lijebukura swam from Likiep to Bikini- [200 miles] where she drove away the powerful spirit Vorijebatu. Then she went to Rongelap and lived in a stone (Kramer and Nevermann 1938).

18. *Bokuta*, a cavity (*kalibok*). Here something human happened to Lakalibok, who, while being tattooed, could not bear the pain because of the lack of food. The old teasing saying goes: "*Jalili nan kijen Bokuta, e kij jirik, me jirik, bau jen Muinmuij ob uajiri: rib; jarek ni eo: rab.*" "Bokuta, ate sweets at his meals, bit something off, chewed a little, and stepped out of the hut *Muinmuij*; when he was dyed; he let go, and when the needle was pulled out, he passed excrement!" (When one has eaten cooked foods, he must not chew pandanus since this weakens one, makes cavities in the teeth, and has other bad effects) (Erdland 1914). The anidj Re-bokota learned tattooing on Erkiup and brought the art to Rongelap (Kramer & Nevermann 1938). They also lists Re-bokota, as learning tattooing on Enibing and then practiced the art on Rongelap

19. Kramer and Nevermann (1938) tells of an *anidj* Lanjan who lives in a gengi tree in salt water. Lanjan sailed to Ikidj en Aerik, a Rongelap island, his land, during his pleasure trip he had four men and four women on board. (Taken from Kramer's song of Lanjan)
watoktok ne manin aom (Count the people (men) of your boat)
Lanji anim, Lemangeoaim, Lebuk ralim, Lakbel,
won ne kera in oa ne (Who are the women of the boat?)
Libarijurim, Me Liondjongrik, Me Likerilem ,Me Likjiltak

A Woman from the Spirit Island Eb Makes Chief Abrelan Happy, told to Erdland (1914) by Lejitnel on Rongelap.

Once there were two women from the Island of Eb who came to Rongelap. They had fled the island and played various tricks on the chief, probably with the intent of gaining his attention to their beauty.

Two women sang: "Kirjani, jani, I am throwing away my ear ornament, the pandanus blossom; a sandpiper are you, a sandpiper am I; the sandpiper runs on the seaside and listens to the surf of the high waves on the weather side; we shake with hunger, draw sucked-out pandanus cones through the water; we make our drinking water cloudy, Abrelan; here is his bathing place, let us flee!"

The next day they did so. People delayed them, and both wept: "Let us go, we want to go to the dwellings of the spirits." "Ha, ha, ha, we see that these women are very beautiful and we are supposed to let them go?" Both went to the chief's hut and stayed there.

They said to the chief: "We are homesick!" The chief replied "Where are you from?"

"From Eb!" they replied.

"Well now, let us depart!" So they journeyed back.

Not far from the island the younger woman jumped into the sea and ordered her Eb people to receive the chief as befits his rank and to prepare sweet chief's food. As soon as the canoe landed, all the inhabitants of the island came to take the canoe apart and carry it off (which was a show of hostility, the Eb people wanted to kill the arrivals). The strangers lived there. The older woman liked the chief and his subjects.

These people said: "The breeze is a favorable one, . . . this village is still absent, that one is still absent." Then a land crab appeared and spoke, "We do not fear the spirits; the canoe has cut the waves, has sunk, sunk, has come up, come up, sunk, and disappeared! While the crab spoke he dug holes in the ground and pulled out the canoe parts hidden by the Eb people. As soon as the canoe had been put together again, they departed.

They traveled on to the middle of the high seas. Then, when they looked up, the north sky was obscured with Eb people flying in pursuit of them and obscuring the sky. The woman spoke, "Draw a fish pole around in a semicircle!" The chief obeyed and drew a fish pole around in a circle. "The Eb people are leaping into the sea. Ah! There is plopping, there is gurgling; sharks, devour this fish!"

Two people came flying. The woman spoke, "They are my father and my mother." They came to say, "If you go off to fish, Abrelan, do not leave your sister (Eb woman) on land; whenever you travel, take her with you." They flew away; and the canoe sailed on.

One day the chief forgot the woman. A wind came up, blew him off course, and he died.