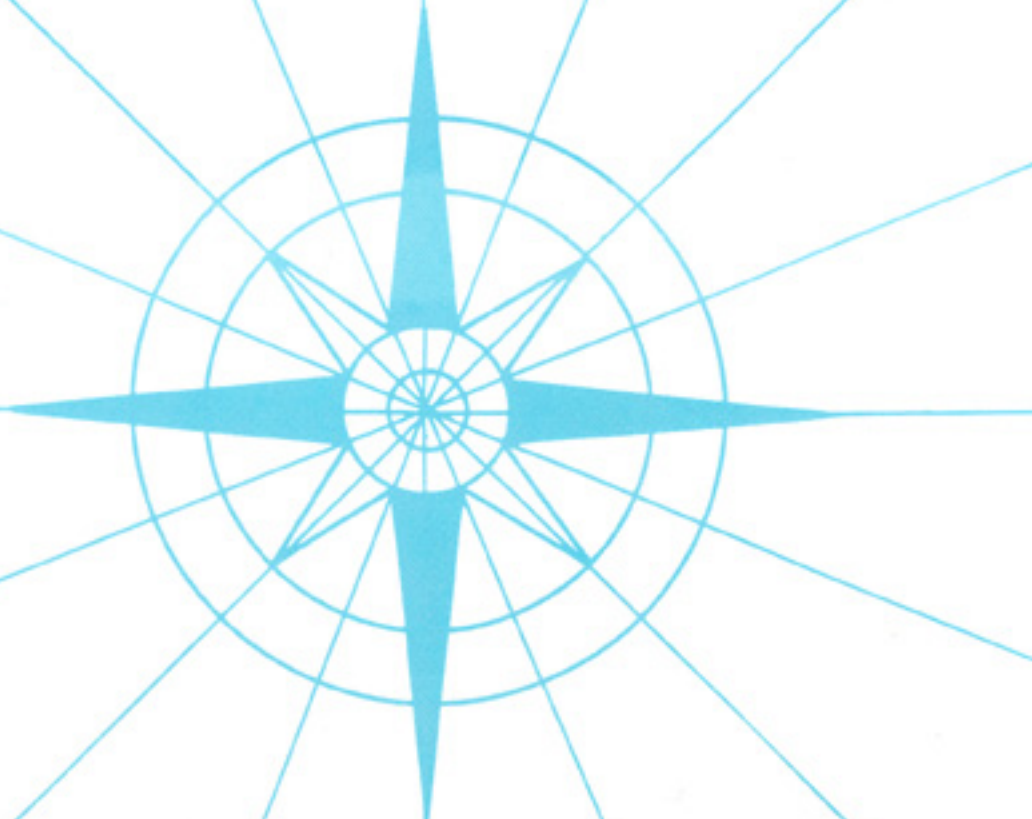


Micronesia

Submerged Cultural Resources Assessment



**Toni Carrell, Editor
Submerged Cultural Resources Unit
National Park Service**

MICRONESIA



**SUBMERGED CULTURAL RESOURCES ASSESSMENT
OF MICRONESIA**

by

Toni L. Carrell, Editor
Submerged Cultural Resources Unit

Don Boyer
Bureau of Land Management

Richard Davis
Guam Historic Preservation Office

Marjorie G. Driver
Micronesian Area Research Center

Kevin Foster
Maritime Initiative

Daniel J. Lenihan
Submerged Cultural Resources Unit

David T. Lotz
Guam Department of Parks and Recreation

Fr. Thomas B. McGrath
Micronesian Area Research Center

James E. Miculka
War in the Pacific National Historical Park

Tim Rock
Marine Images

with contributions from
Rose S.N. Manibusan, Dennis Blackenbaker
William Cooper, Edward Wood
and Suzanne Hendricks

Southwest Cultural Resources Center Professional Papers
Number 36

Santa Fe, New Mexico
1991

Submerged Cultural Resources Unit
Southwest Cultural Resources Center
Southwest Region
National Park Service
U.S. Department of the Interior

TABLE OF CONTENTS

LIST OF FIGURES. ix

LIST OF TABLES. xv

FOREWORD xvii

ACKNOWLEDGEMENTS xix

SECTION I. INTRODUCTION AND BACKGROUND

 I. INTRODUCTION - Toni L. Carrell

 Introduction. 1

 Project Objectives. 2

 Research Design 2

 Funding. 3

 Study Mandate 4

 Project Participants. 6

 Island Names. 7

 II. ASSESSMENT AREA BACKGROUND - Toni L. Carrell

 Introduction. 9

 Geographic Scope. 10

 Geologic Setting. 26

SECTION 11. MARITIME HISTORICAL OVERVIEW

 111. PREHISTORIC MARITIME WATERCRAFT AND SETTLEMENT. 47

 Richard Davis

 IV. EUROPEAN DISCOVERY, CONTACT AND COLONIZATION

 Toni L. Carrell, Marjorie G. Driver

 Introduction. 59

 Discovery and Exploration 60

 Contact, Conquest and Colonization. 70

 Mariana Islands. 70

 Contact, Commercialization, Christianization. 94

 Caroline, Marshall and Gilbert Islands 94

V. COLONIALISM. WORLD WAR I AND THE INTERWAR YEARS
 Toni L. Carrell. Fr. Thomas B. McGrath

Introduction.	139
American Colonialism.	140
Guam	140
German and British Colonialism.	150
N. Mariana Islands	151
Caroline and Marshall Islands.	153
Gilbert Islands.	162
World War I	169
N. Mariana. Caroline and Marshall Islands.	169
Gilbert Islands.	178
Interwar Years.	180
N. Mariana. Caroline and Marshall Islands.	182
Gilbert Islands.	192

VI. WORLD WAR II - Don Boyer

Introduction.	197
Historical Research	200
War with Japan Begins	201
First Strikes in the Pacific.	205
Second Phase of Operations in the Pacific	210
Central Pacific Offensive	221
Assault on the Mariana Islands.	245
End of the Line in the Central Pacific.	258

VII. POST WORLD WAR II, THE NUCLEAR AGE TO PRESENT -
 Toni L. Carrell

Introduction.	267
Trust Territory of the Pacific Islands.	268
Northern Mariana Islands.	268
Caroline Islands.	270
Marshall Islands.	271
Gilbert Islands	275
The Modern Era.	277

SECTION III. SHIP LOSSES IN MICRONESIA

VIII. SHIPWRECKS: THE HISTORICAL RECORD - Toni L. Carrell

Introduction.	279
Ship Losses 1520 to 1941.	280
Ship Losses 1941 to 1946.	292
Ship Losses 1946 to 1990.	324

IX. SHIPWRECKS: THE ARCHEOLOGIAL RECORD
 Toni L. Carrell. Daniel J. Lenihan. David T. Lotz.
 James E. Miculka

Introduction.	321
Mariana Islands	329
Saipan	329
Rota	335
Guam	355
Caroline Islands.	397
Republic of Belau.	399
State of Kosrae.	452
Chuuk (Truk)	460
Marshall Islands.	464
Bikini and Kwajalein	464

SECTION IV. OTHER SUBMERGED CULTURAL RESOURCES AND UNDERWATER COMPONENTS OF LAND-BASED SITES

X. OTHER SUBMERGED CULTURAL RESOURCES: THE HISTORICAL RECORD - Toni L. Carrell. Don Boyer. Tim Rock

Introduction.	467
Site Types. Present or Potentially Present.	467
Prehistoric Sites.	467
Historic Sites	469
Known Sites Not Investigated.	416
Mariana Islands.	416
Caroline Islands	486

XI. OTHER SUBMERGED CULTURAL RESOURCES: THE ARCHEOLOGICAL RECORD - Toni L. Carrell. Kevin Foster. Daniel J. Lenihan. David T. Lotz. James E. Miculka

Introduction.	491
Mariana Islands	498
Saipan	498
Rota	511
Guam	514
Caroline Islands.	529
Republic of Belau.	529
State of Pohnpei	546

SECTION IV. MANAGEMENT RECOMMENDATIONS AND CONCLUSIONS

XII. MANAGEMENT RECOMMENDATIONS AND CONCLUSIONS - Toni L. Carrell

Introduction.	549
Management Recommendations.	549
Conclusions	552

BIBLIOGRAPHY	555
APPENDIX A: Island Names	583
APPENDIX B: Chronology of Events During world War II . .	603
ABOUT' THE AUTHORS AND CONTRIBUTORS	613

LIST OF FIGURES

2.1	Pacific Basin.	11
2.2	Micronesia base map.	14
2.3	Location of Mariana Islands.	16
2.4	The Northern Mariana Islands	17
2.5	Location of the Caroline Islands	19
2.6	Federated States of Micronesia	20
2.7	Location of Belau (Palau).	22
2.8	The islands of Belau	23
2.9	Location of the Marshall Islands	24
2.10	The Marshall Islands	25
2.11	Location of Kiribati (Gilbert) Islands	27
2.12	The Gilbert Islands in the State of Kiribati	28
2.13	Harbors and bays on Guam	32
2.14	Apra Harbor, Guam.	34
2.15	Location of Agat and Asan Units.	35
2.16	Base map of Rota	38
2.17	Base map of Tinian and Saipan.	40
2.18	Location of American Memorial Park. Saipan	41
2.19	Base map of Kosrae	43
2.20	Major harbors and bays on Belau.	45
3.1	Jaluit sailing canoe	48
3.2	Techniques of tacking and shunting	53
3.3	Flying proa of the Mariana Islands	54
3.4	Distribution of double-outrigger canoes.	55
3.5	Distribution of double canoes.	57
3.6	Distribution of single-outrigger canoes.	58
4.1	Voyages of exploration 1521-1543	63
4.2	Voyages of exploration 1566-1595	67
4.3	Galleon route across the Pacific	72
4.4	Champan used by the Chinese Choco.	76
4.5	Mariana Islands from a 1752 map.	71
4.6	Guam from a 1671 map	79
4.7	Umatac Harbor.	80
4.8	Carolinian proas	87
4.9	Apra Harbor ca. 1819	90
4.10	Father Paul Klein's map of Palaos. 1696.	96
4.11	Naval-based scientific expeditions. 1817-1825.	105
4.12	Map of the Ralik Islands	107
4.13	Naval-based scientific expeditions. 1828-1840.	108
4.14	First visits by whaling ships.	111
5.1	USS GOLD STAR in 1924.	149
5.2	Colonial status in 1892.	152
5.3	Spanish steamer VELASCO.	156
5.4	Gilbertese 100-foot baurua under construction.	166

5.5	Colonial status of the islands in 1914	171
5.6	Colonial status of the islands in 1919	181
6.1	Japanese merchant losses from submarines	204
6.2	Tarawa and Makin	225
6.3	Limits of Japanese occupation.	229
6.4	Kwajalein, Wotje, Jaluit. Maloelap and Mili	230
6.5	Japanese merchant ship losses to Army.	241
6.6	Japanese losses to Navy aircraft	242
6.7	Japanese losses to Navy carrier planes	243
6.8	Assault on the Mariana Islands	247
6.9	Battle to capture Saipan	250
8.1	Profile of Manila galleon. ca. 1600.	282
8.2	CS SCOTIA wrecked outside Apra Harbor.	287
8.3	EDWARD CAREY of Nantucket.	287
8.4	The whaler LEXINGTON	289
8.5	A typical British East Indiaman of 1775.	289
8.6	Typical New England whaling ship. ca. 1841	291
8.7	Deck plan of CHARLES MORGAN.	291
8.8	Damage to shipping in Palau Harbor	321
8.9	Base map of shipwreck sites in Apra Harbor	326
9.1	Sites in American Memorial Park.	332
9.2	Base map of shipwreck sites in Saipan Lagoon	333
9.3	Remains of a small Japanese freighter.	334
9.4	Upended boiler from a Japanese freighter	334
9.5	Bow of possible Japanese submarine chaser.	336
9.6	Remains of a Japanese ship	336
9.7	Base map of documented shipwreck sites	338
9.8	Interior profile of old Japanese freighter	339
9.9	SHOUN MARU at moment of impact	341
9.10	SHOUN MARU burning and sinking	341
9.11	View athwartships at bow of SHOUN MARU	342
9.12	View toward the stern of SHOUN MARU.	342
9.13	SHOUN MARU's how from stem aft to cargo hold	343
9.14	Port and starboard sides blown out	343
9.15	SHOUN MARU's triple-expansion steam engine	344
9.16	Japanese motorcyle in cargo hold	344
9.17	Portholes on SHOUN MARU.	346
9.18	Counter stern on SHOUN MARU.	346
9.19	Auxiliary submarine chasers.	348
9.20	The engine from auxiliary sub chaser	348
9.21	Air cylinders being measured by divers	349
9.22	Remains of a radio	349
9.23	Spare kedge anchor	350
9.24	Small arms ammunition.	350
9.25	Depth charges.	352
9.26	The diesel engine from sub chaser.	352
9.27	Remains of wooden hull framing	353
9.28	The antiaircraft machine gun base.	353
9.29	Heavily encrusted binnacle	354
9.30	Diver examines running light from sub chaser	354
9.31	Depth charge found on sub chaser	356
9.32	Planking partially buried in the sand.	356

9.33	Diver holds up brass fire extinguisher	357
9.34	A small hatch cover from sub chaser	357
9.35	Location of shipwrecks in Apra Harbor	359
9.36	Perspective of CORMORAN and TOKAI MARU	360
9.37	Historic photograph of SMS CORMORAN	362
9.38	Perspective of SMS CORMORAN	364
9.39	Dan Lenihan videotaping hole in CORMORAN	365
9.40	CORMORAN and TOKAI MARU	365
9.41	NPS diver swimming over stack of CORMORAN	367
9.42	Stack of CORMORAN. 1983	367
9.43	Dan Lenihan videotaping CORMORAN wreckage	368
9.44	Gravestone of CORMORAN crew member	368
9.45	Historic photograph of TOKAI MARU	370
9.46	Deck view of TOKAI MARU	373
9.47	Planimetric view of TOKAI MARU site	373
9.48	Winches on deck of TOKAI MARU	374
9.49	Broken forward mast of TOKAI MARU	374
9.50	Valve handle on mast cap of TOKAI MARU	375
9.51	Superstructure amidships of TOKAI MARU	375
9.52	The transport KITSUGAWA MARU	377
9.53	Planimetric view of KITSUGAWA MARU	380
9.54	Bow gun of KITSUGAWA MARU	381
9.55	Historic photograph of NICHYU MARU	385
9.56	Location of ARATAMA MARU in Talofofu Bay	388
9.57	Historic photograph of ARATAMA MARU	389
9.58	ARATAMA MARU resting on shallow bottom	391
9.59	ARATAMA MARU after target practice	391
9.60	Talofofu Bay after typhoon Karen in 1962	391
9.61	Group photo. 1987	392
9.62	Base map of ARATAMA MARU	394
9.63	Folding stockless anchor	395
9.64	Upper portion of a kingpost	395
9.65	Hold stanchions	398
9.66	Steering quadrant in the stern	398
9.67	Japanese transport in Belau	400
9.68	Barge for surface-supplied divers	400
9.69	Active duty training of Naval Reserve divers	401
9.70	Toni Carrell working with Navy dive team	401
9.71	Locations of Japanese ships	403
9.72	Vince Blaiyok positions site with sextant	404
9.73	David Orak videotapes Navy divers	404
9.74	Historic photograph of AMATSU MARU	406
9.75	AMATSU MARU burning	406
9.76	Base map of AMATSU MARU	407
9.77	Anchor chain on AMATSU MARU	408
9.78	Hawsehole in forecandle deck	408
9.79	Ladders from forecandle to main deck	410
9.80	Raised expansion tanks on forward well deck	410
9.81	Piping runs from forecandle aft	411
9.82	Longitudinal piping expansion joint and valve	411
9.83	Interior of deckhouse on AMATSU MARU	412
9.84	Two catwalks aft of the intact bridge	412

9.85	Intact pumphouse behind bridge	413
9.86	Pumphouse skylights.	413
9.87	T.1 fast transports.	415
9.88	Fifteen-inch. 25-mm, antiaircraft guns	415
9.89	Antiaircraft machine guns on T.1	416
9.90	Midships machinery space on T.1.	416
9.91	T.1 type landing ship (transport).	417
9.92	Historic photograph of SHINSEI MARU,	419
9.93	Line drawing of 1C freighter sunk in Belau	419
9.94	Side scan image of RAIZAN MARU	423
9.95	Historic photograph of Shiretoko class oiler IRO	425
9.96	IRO burning after aerial bombing	425
9.97	High-angle gun on IRO.	427
9.98	Catwalk runs length of ship,	427
9.99	Kingposts for athwartship fueling gear	428
9.100	Deckhouse aft on IRO	429
9.101.	Raised fuel tank hatches on aft well deck.	429
9.102	Book found on 15;UR;01 IRO	430
9.103	Page removed from book on 15;UR;01	430
9.104	Historic photograph of SATA.	432
9.105	SATA sinking in Ngeruktabel.	432
9.106	Ngeruktabel Anchorage during bombing strike.	434
9.107	Location of merchant ship.	434
9.108	Base map of ship in Rock Islands	435
9.109	Hatch cover beams on unidentified. merchant ship	437
9.110	Open door into the bridge.	437
9.111.	Small cargo winch.	439
9.112	Large funnel broken off,	439
9.113	Historic photograph of NAGISAN MARU.	441
9.114	Heavy carpet of corals on NAGISAN MARU	441
9.115	Base map of NAGISAN MARU	443
9.116	Deck winch house	445
9.117	Ladder to stern deckhouse.	445
9.118	Historic photograph of KAMIKAZE MARU	446
9.119	Location of LEONORA near Utwa on Kosrae.	451
9.120	Teddy John. HPO for Kosrae	453
9.121.	Tank-filling at Utwa village. 1981	453
9.122	Dan Lenihan records artifacts in Kosrae.	455
9.123	Several items removed by a Scripps expedition.	455
9.124	Boat being readied for underwater video operation	456
9.125	Chief Kan Isiah reviews video footage.	456
9.126	SCRU archeologists make photomosaic of LEONORA	457
9.127	Julian Jonah on LEONORA site	457
9.128	Copper sheathing on LEONORA.	458
9.129	Copperclad container on LEONORA.	458
9.130	Toni Carrell on FUJIKAWA MARU.	459
9.131.	Ready box for gun on NEW MARU.	459
9.132	Mushroom cloud at Bikini	461
9.133	Larry Nordby illustrating USS SARATOGA	461
9.134	Bikinian divers work with NPS/Navy team.	462
9.135	Dan Lenihan shining light into Helldivers.	462
9.136	A 5-inch gun on USS ARKANSAS	463

9.137	PRINZ EUGEN at Kwajalein Atoll	463
10.1	Sites in American Memorial Park. Saipan.	478
10.2	Base map of sites in Saipan Lagoon	480
10.3	Remains of two U.S. Sherman tanks.	481
10.4	Sherman tanks visited by snorkelers.	481
10.5	Other known sites in Apra Harbor	485
10.6	Other known sites in Belau	487
10.7	Other known sites in central Belau	491
10.8	Tony. the Kawasaki Ki-61 Army aircraft	492
10.9	The Zero	492
10.10	Aircraft coded Hap. Hamp then Zeke 32.	493
10.11	Fighter called Tojo or Devil-Queller	493
10.12	Nakajima Ki-27 Army fighter.	494
10.13	Mitsubishi F1M2 naval aircraft	494
10.14	Army Nakajima Ki-43 Hayabusa	495
11.1	Base map of sites in American Memorial Park.	499
11.2	Base map of sites in Saipan Lagoon	500
11.3	Japanese Daihatsu landing barge.	503
11.4	Port and stern quarter of landing barge.	503
11.5	Profile view of landing barge.	504
11.6	Plan view of Japanese Daihatsu barge	504
11.7	Emily four-engined. long-range bomber.	505
11.8	Engine from Japanese flying boat	505
11.9	Tail section of Emily flying boat.	506
11.10	Emily nose and fuselage debris	506
11.11	The Japanese Aichi float plane Jake.	507
11.12	Remains of Jake float plane in Saipan Lagoon	507
11.13	Engine and prop from Jake lost in Saipan	509
11.14	Unidentified plane	510
11.15	Square engine nacelle.	510
11.16	Location of phosphate mine. etc. on Rota	512
11.17	Cable cars ran from mine to factory.	513
11.18	The phosphate factory on Rota.	513
11.19	Phosphate ore transferred to waiting cargo ships	515
11.20	Foundations of a cable tower	515
11.21	Base map of submerged sites in WAPA.	517
11.22	American LVT located off Gaan Point.	520
11.23	Jim Miculka videotaping tank turret.	520
11.24	Tracked vehicles at Shark Hole. Guam	522
11.25	Drawing of tracked vehicles.	524
11.26	Drawing of abandoned truck chassis	524
11.27	Aichi D3A2 dive bomber model	525
11.28	Aichi D3A1	525
11.29	Val dive bomber in action.	527
11.30	Mitsubishi A6M8 and A6M5	527
11.31	Base map of sites in Malakal Harbor.	529
11.32	Japanese communications center on Beliliou	530
11.33	Aircraft and landing craft wreckage.	530
11.34	Cave in which Japanese were immolated.	531
11.35	Shrines to Japanese soldiers cave.	531
11.36	Japanese type "A" landing craft.	533
11.37	Japanese type "G" landing craft.	533

11.38	Japanese Navy landing craft type "A"	535
11.39	Japanese float Aichi E13A1, code-named Jake.	539
11.40	Japanese Betty bomber	539
11.41	Locations of other sites in Belau.	540
11.42	Wing root and fuselage	541
11.43	Interior of G4M Betty bomber	541
11.44	ROV being tended by Thomas Techur.	543
11.45	Diver 100 feet deep on Beliliou Wall	543
11.46	ROV heading down from survey boat.	543
11.47	"White" and "Orange" landing beaches	544

LIST OF TABLES

7.1	Ships sunk in Bikini due to atomic tests	273
7.2	Ships sunk at Kwajalein	274
8.1	Ship Losses. 1521-1541. Mariana Islands	283
8.2	Ship Losses. 1836-1884, State of Pohnpei	286
8.3	Ship Losses. 1832-1884, Marshall Islands	288
8.4	Ship Losses. 1834-1928, Gilbert Islands	290
8.5	Japanese warships sunk within Central Pacific. .	292
8.6	Merchant auxiliary vessels sunk Central Pacific.	306
8.7	Key to World War II ship losses in Belau	320
8.8	Japanese ships sunk in Belau	322
8.9	Key to base map of Apra Harbor shipwrecks. . . .	325
10.1	Japanese planes lost in Micronesia	473
10.2	Key to known sites in American Memorial Park . .	477
10.3	Key to other known sites in Apra Harbor.	484
10.4	Japanese aircraft shot down over Belau	490

FOREWORD

This report on the submerged cultural resources of Micronesia resulted more from a fortuitous set of circumstances than from long-range intent. The services of the Submerged Cultural Resources Unit have been requested by the administrations of different islands since 1981 for a number of totally unrelated projects on submerged sites. Over the next nine years we found that we had visited, and dived in, most of the major island groups while accomplishing those individual tasks.

It also became increasingly apparent during that time that submerged cultural resources were to play a major role in the future socioeconomic development of many of the newly emergent island states, regardless of what status or association they eventually keep with the United States. A significant percentage of the tourists visiting Micronesia are doing so for dive vacations, not surprising for a part of the world in which the land area is so limited but the lagoons and fringing reef systems **so** rich in natural and cultural diversity. This rapidly increasing use has implications for the resources themselves, in addition to the economy, which makes it more important than ever that their nature and fragility are well understood.

I assigned unit staff archeologist Toni Carrell to gather under one cover the results of our various projects in Micronesia, to include historical context by local subject matter experts and to present the whole in a manner that would help enhance understanding and preservation of this unique resource base.

Although this report is by no means intended **as** a comprehensive document, the student of Micronesian history or archeology should find it a useful starting point and overview from which to frame out more intensive research of specific submerged sites. It should also help resource management specialists of island governments appreciate the nature and comparative importance of the submerged cultural resources located in their own area of jurisdiction.

Daniel Lenihan
Chief, Submerged Cultural Resources Unit
U.S. National Park Service

ACKNOWLEDGEMENTS

No research project is successfully accomplished without the cooperation and support of many individuals from initial planning to field operations to the preparation of final camera-ready copy and graphics. This effort was, by nature, long and complex; the list of people who provided substantial assistance to its successful completion is lengthy. Therefore, writing the acknowledgments for this report is not an easy task but one I take a great deal of pleasure in doing.

The project required administrative support, cooperation and coordination between the Western Region and the Southwest Region. Western Regional Director Stan Albright and Southwest Regional Director John Cook have continually supported all of the endeavors of the Submerged Cultural Resources Unit (SCRU); the work in Micronesia is the most recent in a long series of Western-Southwest Region cooperative efforts. Doug Scovill, Chief Anthropologist of the National Park Service (NPS) provided funding support and encouragement to undertake this extensive project. The project also received encouragement from the Washington History Division, under the leadership of Ed Bearss and received personnel support from the Washington-based Maritime Initiative's James Delgado and Kevin Foster. The Western Region National Register Program Division, under Margaret Pepin-Donat, assisted with some aspects of funding and documentation. The Pacific Area Office's Bryan Harry provided planning support and coordination with the Pacific parks.

The Guam Department of Parks and Recreation under the direction of Anthony C. Mariano provided funding for documentation of the ARATAMA MARU. David T. Lotz, the Parks Administrator and Richard Davis, Territorial Archaeologist and Deputy SHPO at that department helped shape the project as an underwater archaeological field course that pulled representatives from many preservation programs in Micronesia.

Ralph Reyes, Superintendent of War In the Pacific National Historical Park (WAPA) supported site documentation both within and outside the parks in Guam and Saipan. WAPA also hosted most of the activities of the SCRU. James Miculka, WAPA Chief Ranger, and Ranger Rose S.N. Manibusan each

participated in site documentation and made written contributions. Their stick-to-it attitude finally resulted in the complete mapping of KITSUGAWA, CORMORAN and TOKAI MARU.

Overall administrative coordination in Belau was provided by Moses N. Sam, then Chief of the Ministry of Social Services. His good humor and unflagging support are appreciated. Vicky Kanai, Chief of the Division of Cultural Affairs and Belau Historic Preservation Officer, provided day-to-day administrative support during the three-month Belau project in 1988. She tackled logistics and solved each problem with enthusiasm. Her colleagues, David Orak and Vince Blaiyok, participated in all aspects of the site documentation and planning for that project. They showed us the beauty of their island home and shared the richness of their cultural heritage.

Commander David McCampbell, USN Mobile Diving and Salvage Unit 1, and Commander Otto Orzech, MDSU-1 Reserves, put together the immense Project Sea Mark operation for Belau. Along with the other reserve unit captains and commanders and both active and reserve unit personnel, they worked extremely hard to make the Belau project successful.

The Micronesian Archaeological Survey, covering the former Trust Territories with the exception of Guam, sponsored the research in Kosrae. The personal support and on-site coordination of Historic Preservation Officer Teddy John was invaluable in the successful completion of this project. We are indebted to Chief Kan Isiah and the people of the village of Utwa for their warm hospitality.

The Southwest Cultural Resources Center, first under Dick Sellars and then Rick Smith, provided direct administrative support. Both Dick and Rick have a strong interest in the activities of the Unit. Ronald J. Ice, Chief of the Division of Anthropology, has continued to let us borrow members of his staff for both the field operations and the completion of this publication.

Many volunteer sport divers helped in the documentation of the shipwrecks in Guam, Saipan and Belau and provided written contributions to this report. Without them, the field work could not have been completed. James R. Roybal completed two artist's perspective drawings in Guam and mapping of shipwrecks in Belau. His skill as an artist contributed greatly to both endeavors. Mark Michael helped with video documentation and mapping of the ships in Belau.

Mark Michael, along with his wife Lynne and volunteer Mark Gunderson, gathered the information needed to complete the documentation of the sites in Rota. Mark and Lynne's personal interest in preserving and understanding the sites in Rota made inclusion of those resources in this report possible.

Without the help of Dave and Suzanne Hendricks, William Cooper, Rich Fischer, Larry Walters, Jim and Bonnie Brandt, Yannis Blackenbacker, and the Apra Sport Divers, the mapping of the CORMORAN, KITSUGAWA MARU and TOKAI MARU would not have been completed, nor would the sites in Saipan have been photographed and artist's perspective drawings completed. Writer and photographer Tim Rock has also been a regular volunteer with WAPA. Many of his photographs are included in this report, and he wrote the sections on submerged cave resources in Chapter 10.

Don Boyer's interest in World War II operations in the Pacific brought him to our Santa Fe office several years ago. When the Belau field work was in the conceptual stage, he willingly shared his information and expertise for the background research necessary to prepare for the field work. He followed that up by writing Chapter 6 and contributing to two others in this report.

I first met Marjorie Driver in 1986 at the Micronesian Area Research Center at the University of Guam. At the time, I was researching losses of landing craft off the two World War II invasion beaches and trying to get some understanding of the ships that have been lost in and around Guam. Marjorie, along with Fr. Thomas McGrath, was kind enough to point me in the right direction. When I found myself quickly overwhelmed in the research and writing of this report, Marjorie and Fr. McGrath agreed to contribute chapters. Marjorie contributed to Chapter 4 and Fr. McGrath to Chapter 5.

Archival research is often the most difficult aspect of project: preparation and write-up. Amalin Ferguson, the Regional Librarian, willingly and regularly tracked down books and articles through interlibrary loan and made them available to me. She also was my principal intermediary with the New Mexico State Library. The researchers at the Peabody Museum; the New Bedford Whaling Museum; the Nantucket Historical Association; the Kendall Whaling Museum; and the Judicial, Fiscal and Social Branch of the National Archives all willingly provided their assistance.

The several hundred Japanese ships sunk during World War II presented their own special research problems. Documents are difficult to obtain and even more difficult to have translated from the old Japanese script. By chance I was

fortunate enough to make contact with a researcher in Japan, Dr. Sanae Yamada, who specializes in shipping. He graciously provided photographs, historical background and operational histories on many of the ships in Belau. Taka Inoue, a Japanese student studying maritime archeology, obligingly translated the documents. The efforts of Mr. Paul Lacke of Tokyo Friendship resulted in tracking down Mr. Fujita of Fujita Salvage and obtaining copies of the only surviving documents on the salvage of the ships in Belau.

Jerry Livingston, who has participated in many SCRU projects in the past, contributed his skills to the shipwreck documentation. Jerry also contributed his considerable skills and spent the extra time necessary to put this report into publishable form by overseeing much of the graphic production needed for printing. Ernesto Martinez took on the job of inking the majority of the graphics for this report. His patience and willingness to accept changes to "finished" illustrations is sincerely appreciated. Larry Murphy, archeologist with SCRU, contributed his significant skills at identifying shipwreck materiel culture to many phases of the work in Micronesia. Ken Vrana, Research Diving Technician with SCRU, energetically assisted the 1977 training and research activities.

A special note of thanks goes to Fran Day who has taken the brunt of the secretarial and editorial duties involved in coordinating and formatting the report to achieve final camera-ready copy. She has done a stellar job once again.

In addition to the various authors and contributors, various sections of the report were reviewed by Dan Lenihan, Margaret Pepin-Donat, Rose S.N. Manibusan, Sean Cahill, Marjorie Driver, Fr. Thomas McGrath, Jim and Susan Miculka, Tim Rock, Richard Davis, Pat Parker, Edwin Bearss, David Lotz, Roger Kelly and Bryan Harry and his staff at the Pacific Area Office.

Dan also provided the overall direction to the Micronesia project. His desire to see the ships and other sites in the islands mapped, photographed, videotaped and researched led directly to the many successful projects there. He believes in documenting, preserving and interpreting the full range of submerged cultural resources not just the "old" ones. That philosophy is also the reason that nonshipwreck sites have been included as "other" submerged cultural resources in the work of the Unit.

Any inaccuracies, misrepresentations, or downright errors in this publication are my sole responsibility. It is also my pleasant duty to thank the numerous contributors to the project and this report. Finally, this report is a labor of love. It is offered to the people of Micronesia in the hope that in some small way it will preserve a piece of their rich and varied cultural heritage.

Toni L. Carrell

CHAPTER I. INTRODUCTION

By Toni L. Carrell

Introduction

This assessment report on the submerged archeological sites of Micronesia has been designed within a resources management framework. The project was geared toward generating information that would be useful in submerged cultural resources site interpretation, protection and conservation; in contributing to the historical understanding of the islands and the maritime history of the region; and in answering questions of general archeological and historical interest.

Projects in which funding and time constraints dictate a segmented approach require special attention in the planning phases and the organization of work undertaken. The results of each segment should meet specific management needs and be able to stand alone as individual management documents. Conceptualized as distinct phases or steps, the ideal course of research follows a logical sequence beginning with initial reconnaissance assessment, succeeded by inventory of all known submerged resources in an area, and followed by survey of high probability areas for new sites. Each of these steps is discussed in greater detail elsewhere in this report.

Funding, priorities, and other constraints rarely permit the ideal research sequence to occur. More commonly it is segmented and conducted in response to specific management needs. The Micronesia assessment project falls into this category, i.e., there has never been a programmed or funded survey of submerged cultural resources in Micronesia. A series of unrelated requests for technical assistance resulted, however, in the de facto accomplishment by the National Park Service's Submerged Cultural Resources Unit (SCRU) of many of the requirements for a regional site assessment. Dan Lenihan, Chief of the Submerged Cultural Resources Unit, decided to invest personnel resources in the compilation of this information under one cover with the addition of contextual and support studies. It was felt the information would be more useful in that context than

residing in filing cabinets as specific trip reports and site studies.

There are hundreds of known shipwreck and nonshipwreck submerged sites in the islands of Micronesia. The sites that are reported on in detail in Chapters 9 and 11 are limited to only those sites that were visited by members of SCRU, the submerged-research team of the War in the Pacific National Historical Park, or representatives of Guam's Department of Parks and Recreation (DPR). These sites were evaluated or documented beginning with a brief visit by the SCRU in 1981 and continuing intermittently until 1988. The results of the research provide information on a variety of sites in the present and former Trust Territories. Recommendations for the long-term management, interpretation, protection, and conservation of the cultural resources investigated are offered.

Project Objectives

The goals of the field portions of this project were fourfold: (1) to thoroughly document and describe the remains of a number of specific shipwrecks in Kosrae, Guam and Belau; (2) to evaluate and describe the present condition of other shipwreck sites in Saipan, Rota, Guam and Belau; (3) to examine and document, when possible, the remains of a variety of other nonshipwreck sites in Saipan, Rota, Guam and Belau; and (4) to provide baseline information on the submerged resources of the islands for evaluation of site significance and suitability for nomination to the National Register of Historic Places and the cultural resources registers of the various islands.

Research Design

This research was designed to address questions that fall into five categories: (1) What is the nature of the construction and technology of historic ships sunk in the islands? (2) How have shallow- and deep-water deposition affected site deterioration or preservation and research potential? (3) What social, economic, and environmental conditions extant in Micronesia have affected the nature and potential deposition of ships and other site types, and how do these sites fit into the historical context? (4) What role did the ships and other sites play in the history of Micronesia? and (5) What is the range of potential site types and what documented ship losses occurred in Micronesia?

The primary objectives of the project were site documentation and evaluation. For shipwreck sites, specific questions were posed addressing general ship construction, that is, hull configuration and framing, internal or external strengthening, hatch arrangement, machinery, engines, and armament. These are addressed primarily in Chapter 9. For the other site types, the nature and condition of prehistoric and nonshipwreck historic remains are addressed in Chapter 11.

Chapters 9 and 11 address the impacts of shallow- and deep-water deposition on physical site integrity and research potential. The relationship between the loss of ships and deposition of other sites and the social, economic, and environmental milieu in the region are considered in Chapters 3, 4, 5, 6 and 7. The historical or prehistorical role of the ships is also addressed in those chapters. Finally, the range of potential site types and documented ship losses are reviewed in Chapters 8 and 10.

It is important to note that the historical overviews in this report were designed to provide a context for discussion of the archeological record. For this reason, certain categories of information of equal significance are given more attention than others. The most dramatic example occurs in our coverage of Japanese versus American shipping losses during World War II in Chapter 8. Much more emphasis is given to Japanese losses because we are concerned most with vessels that have been sunk in waters accessible to the diving public and at depths subject to archeological research without use of extraordinary technology. With the exception of Bikini Atoll and Kwajalein, wherein lie many wrecks of US vessels due to atomic testing and which we have covered in a separate report, there are very few World War II related American vessels that meet these criteria.

Funding

SCRU operations during this period were funded by a wide variety of sources including the governments of the islands requesting the work, the NPS archeological assistance program and training and operational funds of the United States (U.S.) Navy. Project SeaMark, which is a cooperative working arrangement between the NPS and the Navy, is a mechanism for achieving historic preservation goals on underwater sites. It was the source for the assistance rendered by the Navy in the projects covered in this report and many subsequent projects in other geographical areas. Additional financial contributions came from the Arizona Memorial Museum Association.

Study Mandate

A number of specific historic preservation laws support study of the resources within the former Trust Territories. Technically, this work partly fulfills the comprehensive inventory task of the U.S. Historic Preservation Program authorized by the National Historic Preservation Act. Assessments such as the one jointly undertaken by the NPS, U.S. Navy and the various island historic preservation programs do more than inventory sites, however. They provide documentation of resources that are receiving increasing visitation and impacts.

The national parks that are located in Saipan and Guam have their own legislative mandate, above and beyond that in place on the islands, that require archeological inventory within the park boundaries.

Saipan

Public Law 94-241, dated March 24, 1977, made available to the Government of the Northern Mariana Islands the 133-acre parcel "...for the public use as an American Memorial Park to honor the American and Marianas people who died in the World War II Marianas Campaign."

On August 18, 1978, the U.S. Congress enacted Public Law 95-348, which established American Memorial Park on the island of Saipan. The NPS was given the responsibility to develop, maintain and administer the park "...for the primary purpose of honoring the dead of the World War II Mariana Islands Campaign."

The NPS was directed to develop the park as a "living memorial" as part of the covenant agreement between the Commonwealth of the Northern Mariana Islands (CNMI) and the U.S. One aspect of that directive was the commitment by the NPS to seek the assistance of appropriate historians to interpret the historical aspects of the park.

As part of the covenant, the CNMI can request the transfer of the administration and all facilities of the park should it so desire. As a result, the NPS does not own nor will own any of the lands and waters on which the park is being developed. Boundaries for the park are not firmly set. The authorizing legislation does not include a boundary description or a reference to a boundary map. There are no clear guidelines as to who is responsible for the offshore

areas of American Memorial Park. In the general management plan, a boundary map places the offshore boundary at 100 meters from the mean high-tide line.

Guam

On August 18, 1978, the U.S. Congress enacted Public Law 95-348, which established the War in the Pacific National Historical Park in the Territory of Guam.

Section 6.(a) of the act that created the park states:

In order to commemorate the bravery and sacrifice of those participating in the campaigns of the Pacific theater of World War II and to conserve and interpret outstanding natural, scenic, and historic values and objects on the Island of Guam for the benefit and enjoyment of present and future generations, the War in the Pacific National Historical Park (hereinafter in this section referred to as the "park") is hereby established.

It is very important to note that the park was established to honor all the people from all nations and that it was not established as a tribute to just one particular country or group of people.

Additional subsections of the act that are relevant to this assessment include the following:

(d) Other points on the Island of Guam relevant to the park may be identified, established, and marked by the Secretary in agreement with the Governor of Guam.

(e) The Secretary shall administer property acquired in accordance with the laws generally applicable to the management of units of the National Park System.

(f) The Secretary is authorized to seek the assistance of appropriate historians to interpret the historical aspects of the park. To the greatest extent possible, interpretive activities will be conducted in the following three

languages: English, Chamorro and Japanese.

Outside the boundaries of the national park system, the NPS, as a part of the Department of the Interior, also has a major responsibility to provide assistance for conservation and preservation of resources in the former island trust territories under U.S. administration.

Project Participants

In addition to the participation of U.S. Navy personnel, both active and reserve, from Mobile Diving and Salvage Unit 1, the field assessment and documentation phase involved many individuals, both in and out of government service.

The documentation of the ship ARATAMA MARU was completed as part of the Underwater Archeology Survey and Training Course hosted by GovGuam. Participants in the field documentation included David T. Lotz, Guam DPR; Kevin Foster, NPS-Washington Office, History Division; Jim J. Brandt, Guam; Mark Michael, Rota; John Salas, Guam DPR; Vic April, Guam DPR; David Orak, Belau Cultural Affairs; Margaret Pepin-Donat, NPS-Western Region; Butch Irish, University of Guam; Mike Fleming, CNMI; Victor H. Torres, Guam DPR; Vince Blaiyok, Belau Cultural Affairs; and Ken Vrana, Toni Carrell, Dan Lenihan and Larry Murphy, SCRU.

James Miculka, WAPA Park Chief Ranger, and Rangers Jimmy Garrido, Kevin Carter, Randy Sablan and Rose S.N. Manibusan participated in site documentation in WAPA and on the KITSUGAWA MARU, CORMORAN and TOKAI MARU in Guam. They also documented the ships and other sites in Saipan. They were joined at various times by Jerry L. Livingston, NPS-Southwest Region Division of Anthropology, and by volunteer divers Suzanne Hendricks, Dave Hendricks, Tim Rock, William Cooper, Larry Walters, Jim Brandt, Bonnie Brandt, Richard Fisher, Dennis Blackenbacker and the Apra Sport Divers.

David Orak and Vince Blaiyok from the Belau Division of Cultural Affairs participated in the documentation of all of the sites reported on in Belau. Joining them were volunteer divers James R. Roybal and Mark Michael. Southwest Region NPS personnel included Jerry L. Livingston and James E. Bradford, Division of Anthropology; and Toni Carrell and Dan Lenihan, SCRU. Kevin Foster from the NPS National Maritime Initiative also participated.

Mark and Lynne Michael, owners of Dive Rota, were assisted by Mark Gunderson in the follow-up documentation of the sites in

Rota. Toni Carrell and Ken Vrana participated in the initial documentation.

The Bikini project participants were Jerry L. Livingston and Larry V. Nordby, Division of Anthropology; James Delgado, Maritime Initiative; and Daniel J. Lenihan and Larry Murphy, SCRUI.

Island Names

For more than 400 years, vessels of nations involved in exploration, colonization, and commerce crossed the Pacific and discovered and claimed the islands they encountered. In the process, they gave the islands many different names. Accurate location and identification were difficult for the early explorers; as a result islands were "discovered" and named several times over. Islands were also purposefully renamed by later colonial administrators. In addition, the native peoples have a multiplicity of names for their islands, often with a bewildering variety of spellings. A veritable flood of names has been bestowed upon the many islands of Micronesia. Finding the current name, or worse yet, trying to match an historic name with a particular island can be extremely frustrating.

When this research project began, confusion added to frustration because of the sheer numbers of islands and the variations on their spelling. Wherever possible, we decided to adhere to the contemporary usage in those chapters that dealt with the maritime historical overview, tempered with the modern spelling of place names. In Chapter 4, for example, the Mariana Islands are referred to as the Ladrones and Belau as the Palaos. If there is any question about the name, that is, if it is not immediately apparent which island is being referred to, the modern spelling follows the historic one. In Chapter 6, dealing with World War II, the spellings of the islands reflect the then current and more commonly recognized usage. In all other chapters, the modern spellings are used, it being incumbent upon the rest of the world to call the islands by the name the citizens prefer. Again, if there is any question about which island is being discussed, the traditional English names follow the modern ones. Appendix A provides an alphabetical index to the place names in Micronesia along with their variants. Names in all capital letters are the standard modern names, those officially approved and recommended for current use. Names that are in lower-case letters with initial capitals are variant spellings or names, which are followed by the current preferred spelling.

CHAPTER 11.
ASSESSMENT AREA BACKGROUND

By Toni L. Carrell¹

Introduction

The Pacific Basin occupies one-third of the Earth's surface and is, thus, the largest single feature on the planet. Within this vast expanse lie approximately 25,000 islands, more than can be found in all of the remainder of the world's oceans. The islands are scattered from the Arctic Circle in the north to the Antarctic in the south and exhibit great variety and extremes in physical-biotic and human environments. Combined, they total more than 1 million square miles of land area (Thomas 1967:1). Yet, the most significant feature of the Pacific is its emptiness.

Despite the basin's limited land mass, nearly all of the islands as well as its Asian and American continental shores were discovered and settled hundreds of years before the Vikings ventured westward or the first Europeans arrived. Dotted with islands whose reefs abounded with fish and *bêche-de-mer*, whose forests contained woods both fragrant and beautiful, and whose streams provided clear sweet water, the western and southern Pacific and its islands were discovered and inhabited by people migrating from Southeast Asia, the Philippines, Indonesia and the islands north of New Guinea. Movement between the island archipelagos further spread and intermixed races and territories. The descendants of these people, while physically distinct, share the obvious traits of seafaring and navigation. Today, they are generally referred to as Polynesians, Melanesians and Micronesians, differentiated by cultural, linguistic and physical differences. There is still much to learn about all of these voyagers, perhaps the earliest maritime explorers; however, Micronesia is the focus of this study.

¹With contributions from James E. Miculka and Rose S.N. Manibusan.

The purpose of this chapter is to introduce the people and islands of Micronesia by discussing their physical differences, location, size, origin, major land form features, climatic types, vegetation and life zones.

Geographic Scope

The Pacific Basin

The immensity of and great distances within the Pacific Basin often make it difficult to conceptualize the basin as a single earth feature (Figure 2.1). The basin is 9,200 statute miles from the Bering Strait to the Antarctic Circle, 10,400 statute miles wide at the equator from Ecuador to Indonesia, and 12,300 miles--almost one-half the circumference of the earth--from Singapore to Panama (Thomas 1967:2). In all, it comprises an area of more than 68 million square miles. The basin is ringed by more than 400 active volcanoes and its oceanic trenches reach closer to the earth's core than does any other place on earth; four of the trenches are more than 6 miles deep. Tectonic activity makes this the most unstable one-third of the planet. The Andes and Rocky Mountains, and their near-shore coastlines, form the eastern barrier of the basin. The Aleutian Islands arc across the Pacific on the north and extend nearly to Kamchatka. Along the Asian continent the Kurils, Japan, the Ryukyus, the Philippines, Indonesia, New Guinea and Australia form the western boundary. Between these islands and their continental mainlands are marginal seas: the Bering, Okhotsk, Japan, Yellow, Philippine, South China, Java, Coral and Tasman.

The larger islands are all located within the western or southern Pacific and generally form convex arcs toward the open northeast. At first glance it appears that they are randomly scattered; however, almost all are between latitude 30° north and 30° south, trending east-southeast from southeast Asia toward Easter Island (refer to Figure 2.1). Most are close enough together to be easily clustered into archipelagos or groups. The notable exceptions, those islands more than 400 statute miles from any other, are Clipperton, Easter, Isla Sala y Gomez, Johnston, Norfolk, Marcus and Parece Vela.

The People

Although it is convenient to group the people of the western and southern Pacific islands into three areas--Melanesia (black islands), Polynesia (many islands) and Micronesia

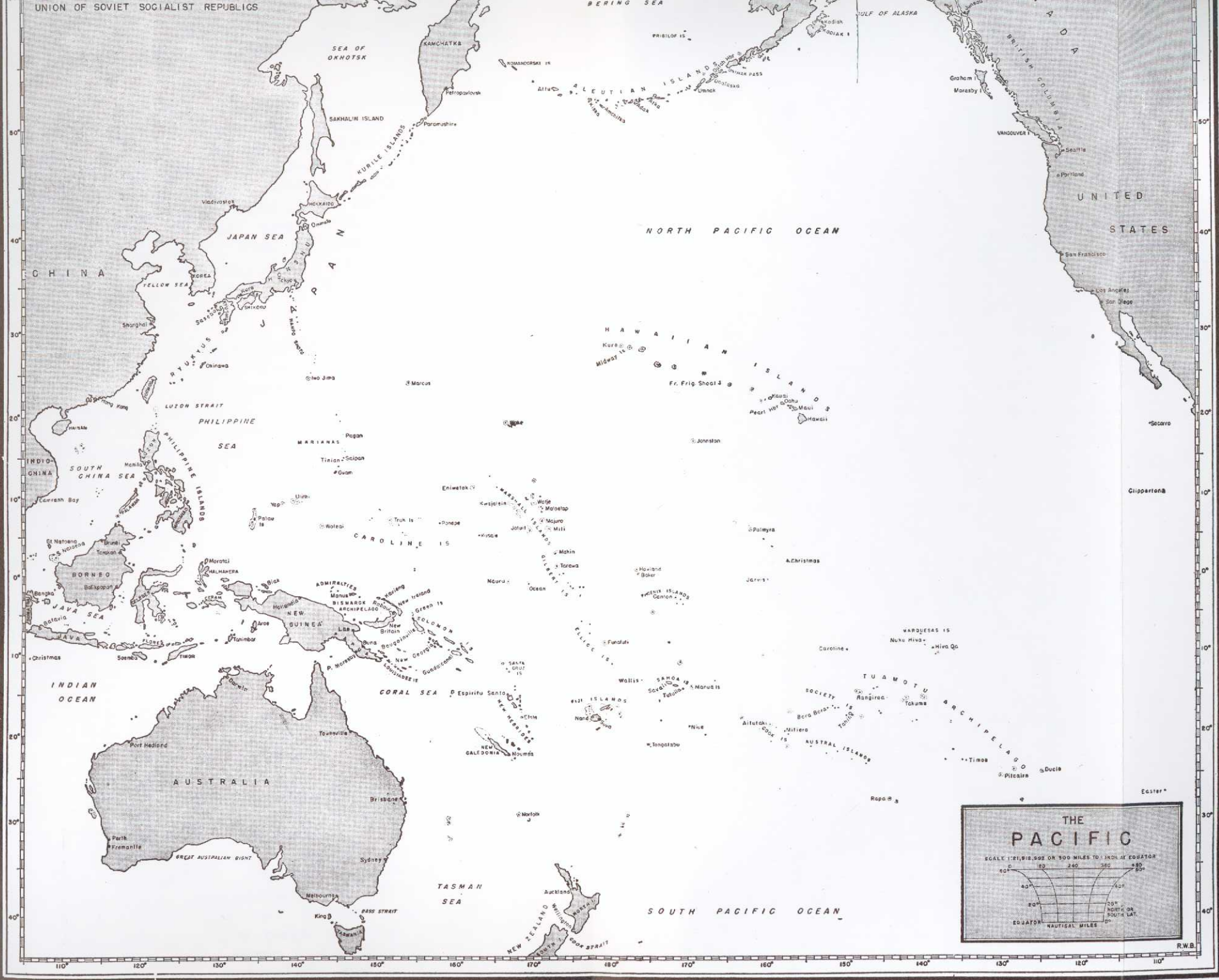


Fig. 2-1 Pacific Basin.

(small islands)--based on linguistic and racial differences, in reality this division is not clear cut. Melanesian traces exist in parts of Polynesia, and there are Polynesian populations in both Melanesia (Nukumanu) and Micronesia (Kapingamarangi). Micronesian populations have also settled in Melanesia.

Melanesia includes all the islands extending eastward from Indonesia, south of the equator, from New Guinea to Fiji. Linguistically, the Melanesians speak related but not mutually understandable languages. Palauan's are often included with the Melanesians, however, their languages are unrelated to the Malayo-Polynesian family. Melanesia is generally considered to be the first area settled in the Pacific, more than 25,000 years ago. The Melanesian people, many still poorly understood culturally, are physically similar, being black or dark brown and, in the case of the Papuans, having frizzly black hair.

The islands of Polynesia form a rough triangle with apexes at the Hawaiian Islands in the north, New Zealand in the south, and Easter Island in the east. The important island groups include the Marquesa, Tuamotu, Society, Austral, Cook, Samoa, Tonga and Ellice islands. These people may be the most culturally and linguistically homogeneous of the three island populations. Their language varies only dialectically from group to group and their cultures are very closely related. The first settlements in Polynesia have been traced to Tonga and Samoa, more than 3,000 years ago. The people have light brown skin and generally straight black hair.

The Mariana, Caroline, Marshall and Gilbert islands constitute what is traditionally known as Micronesia. The islands lie between 19° north, 3° south latitude and between 130° and 180° west longitude. Today, many of the islands have formed republics that are seeking political recognition and independent status (Figure 2.2). The Caroline Islands are now divided into the Republic of Belau and the Federated States of Micronesia. The latter, in turn, is divided into the states of Yap, Truk, Pohnpei and Kosrae. Guam, separated from the remainder of the Mariana Islands, is an unincorporated territory and its inhabitants are United States citizens. Neither the Marianas nor the Marshalls are part of the Trust Territories anymore. One is the Commonwealth of the Northern Marianas and the other is the Republic of the Marshall Islands. Nauru, formerly part of the Gilbert Islands, is now an independent republic. In some cases old island chain names are no longer in use; for example, the Gilbert Islands are now part of the independent state of Kiribati. These changes, from independence prior to the arrival of Europeans, to colonial possessions, and recently back to independence, now again reflect the

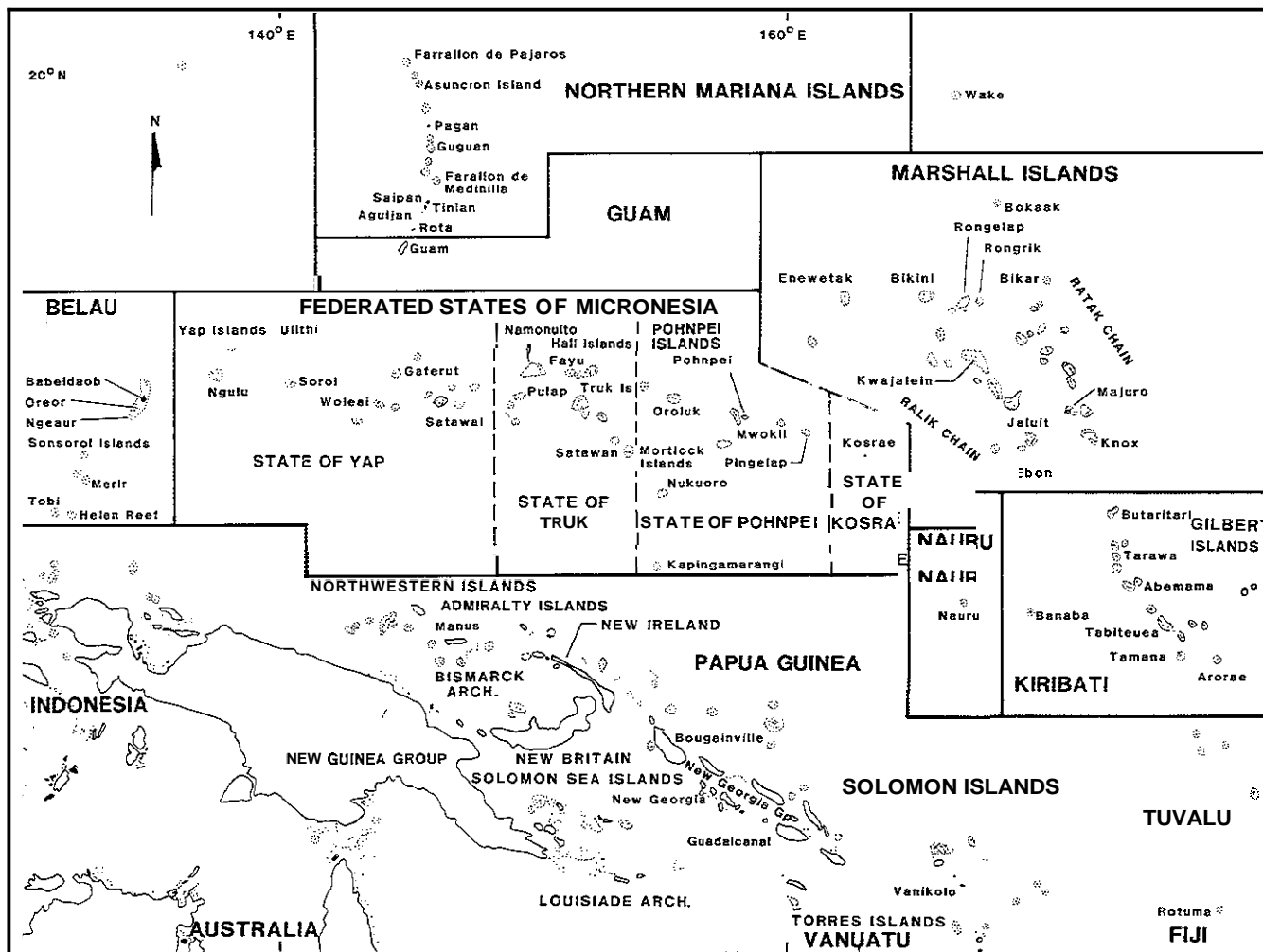


Fig. 2.2. Micronesia base map.

islanders' view of themselves rather than an outsider's arbitrary division of real estate.

Micronesia, not surprisingly, contains traces of both Melanesia and Polynesia. The people range from dark to light brown, have both straight and curly hair, and speak closely related Malayo-Polynesian languages. This region was first settled by voyagers from the Philippines, Indonesia and the islands north of New Guinea between 3,000 and 2,000 B.C.

The Islands

Mariana Islands

The Mariana Islands lie east of the Philippines, north of New Guinea, southwest of the Hawaiian Islands, and south-southeast of Japan (Figure 2.3). They form a chain extending from 13° to $20^{\circ}33'$ north latitude and fall between $144^{\circ}54'$ and $146^{\circ}54'$ east longitude. The four largest islands--Saipan, Tinian, Rota and Guam--are all at the southernmost end. The chain consists of 14 single islands and 1 group of 3 small islands (Maug).

Since the Spanish-American War in 1898, Guam has been administratively separated from the remainder of the Mariana chain. Today the Northern Mariana Islands are a Commonwealth while Guam is an unincorporated U.S. territory. From north to south, the Northern Mariana Islands are Farallon de Pajaros, Maug, Asuncion, Agrihan, Pagan, Alamagan, Guguan, Sarigan, Anatahan, Farallon de Medinilla, Saipan, Tinian, Aguijan and Rota (Figure 2.4). The total land surface of the northern islands is approximately 247 square miles; Saipan, Tinian and Rota occupy two-thirds of this area. These three islands are also the major population centers, not including Guam. Historically, the Mariana Islands as a group were referred to as Los Ladrones.

Saipan

Saipan has been variously called Saepan, Ile de St. Joseph, Saespara, San José, Saypan, Seipan, Saspan, Sepam, Sespan, Supan and Seypan. Located 125 miles northeast of Guam and 1,500 miles southeast of Japan (refer to Figure 2.4), this island was a major administrative and population center during the Japanese administration. The largest of the Northern Mariana chain, it is about 13 miles long, averages 4 miles in width and covers approximately 46 square miles.

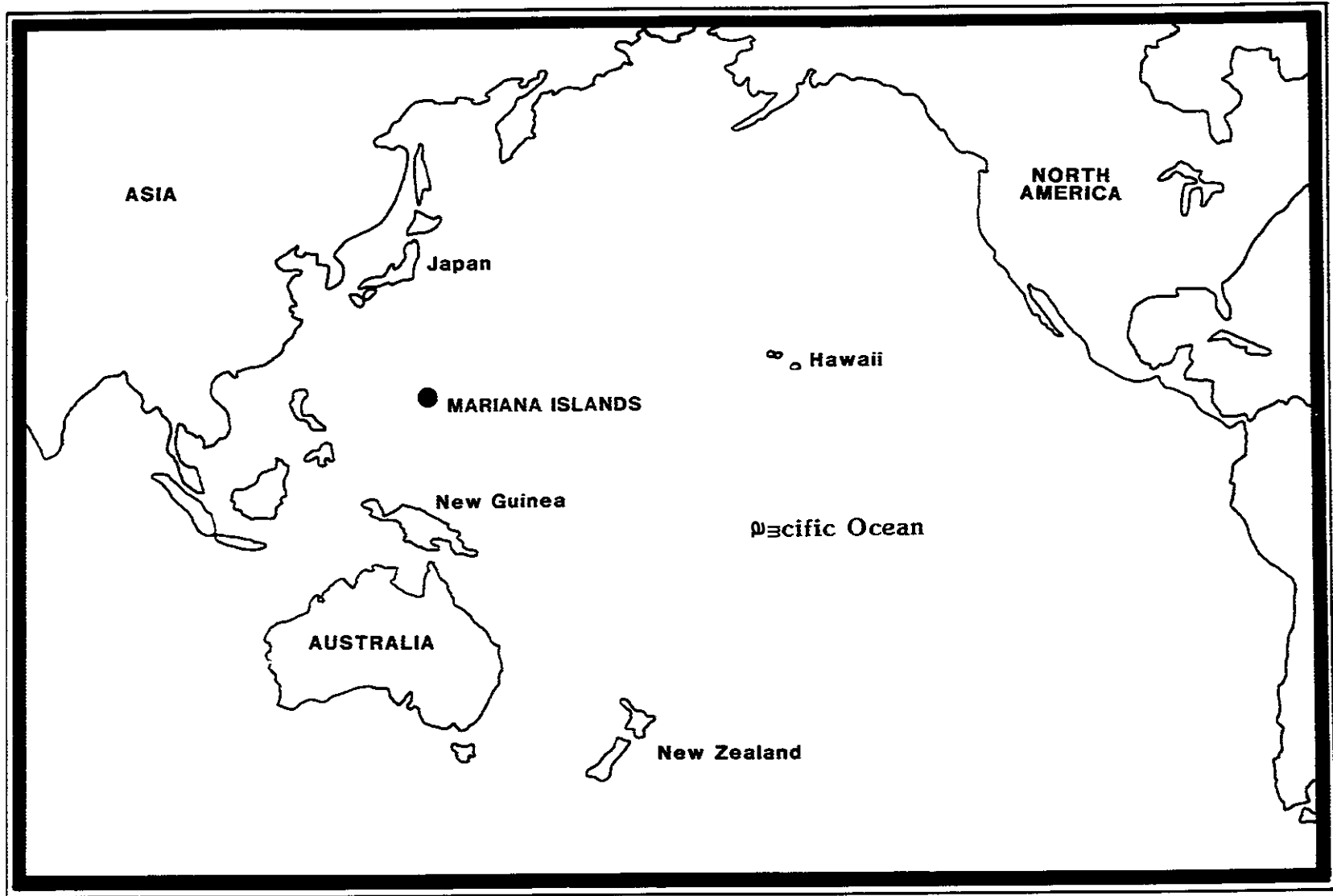


Fig. 2.3. Location of Mariana Islands.

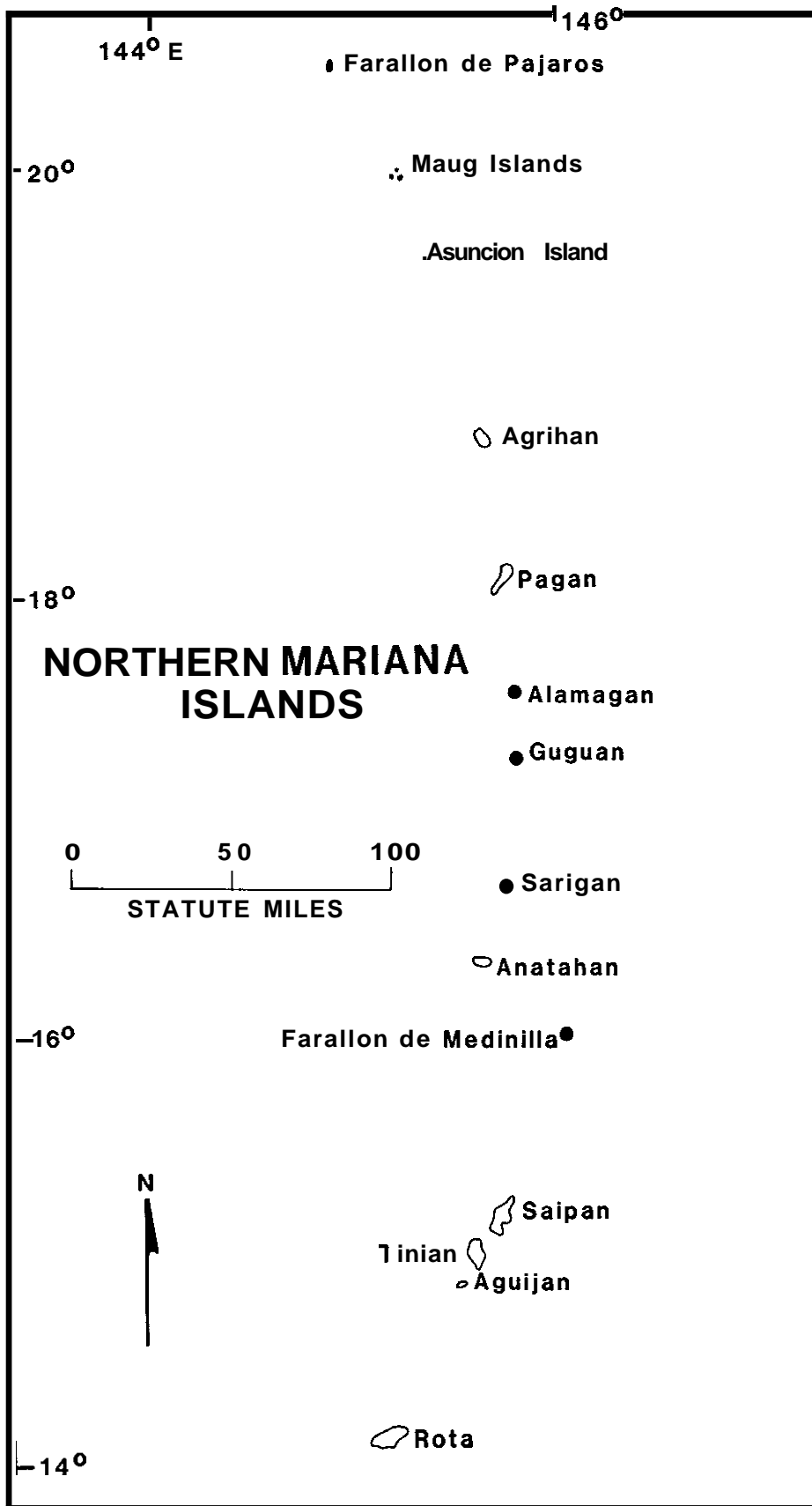


Fig. 2.4. The Northern Mariana Islands.

Tinian

Historically, Tinian has been referred to as Bona Vista, Buenavista, Temean, Tenian, Tiniamou, Tanian, Tinianion and Zinian, among others. This island is located just over two miles southwest of Saipan and five miles northeast of Aguijan (refer to Figure 2.4). Nearly 11 miles long and 4-1/2 miles wide, the island is 32 square miles. Lower and flatter than the others, it is mostly a plateau that was used to advantage as an aircraft base during World War II,

Rota

Rota has been known as Luta, Ile de St. Anne, Santa Ana, Satpana, Suta, Zarpana, Santa Ana, Sapan, Sarpana O'Rota and Botaha, as well as other names. Located 32 miles northeast of Guam (refer to Figure 2.4), from northeast to southwest it is just over 11 miles long and some 4 miles wide and has an area of 28 square miles. In the past, the island was heavily mined for its phosphate ore.

Guam

Encompassing a land area of 210 square miles, Guam is the largest and southernmost of the 15 islands of the Marianas chain (refer to Figure 2.2). It is 32 miles long and 4 to 9 miles wide. The island has been known by many names including Bacim, Bahan, Bam, Goam, Hoan, Guahan, Guajan, Guajanao, Buayan, Omi Jima, San Juan and Iguana.

Guam is a natural focus of activity within Micronesia. It is the largest and most populous island between Hawaii and the Philippines; has an excellent, well equipped port; is a major communication center; and is the major crossroad of air routes. Guam is only a few hours by jet from such major Asian cities as Tokyo, Seoul, Hong Kong, Shanghai, Vladivostok, Manila, Singapore and Bangkok. Also, Guam is only hours away from Sydney and Auckland. In effect, it is the metropolitan center of the western Pacific.

Caroline Islands

Lying east of the Philippines, south of Japan, north of New Guinea and southwest of Hawaii, the Caroline Islands extend from Kosrae in the east to the Belau archipelago in the west. The islands stretch for more than 2,000 miles, forming a broad belt extending from 131° to 166° east longitude and 0° to 14° north latitude (Figure 2.5). The early European explorers called the islands Islas Carolinas, and until recently they were often referred to as the western and eastern Carolines, divided at approximately 148° longitude,

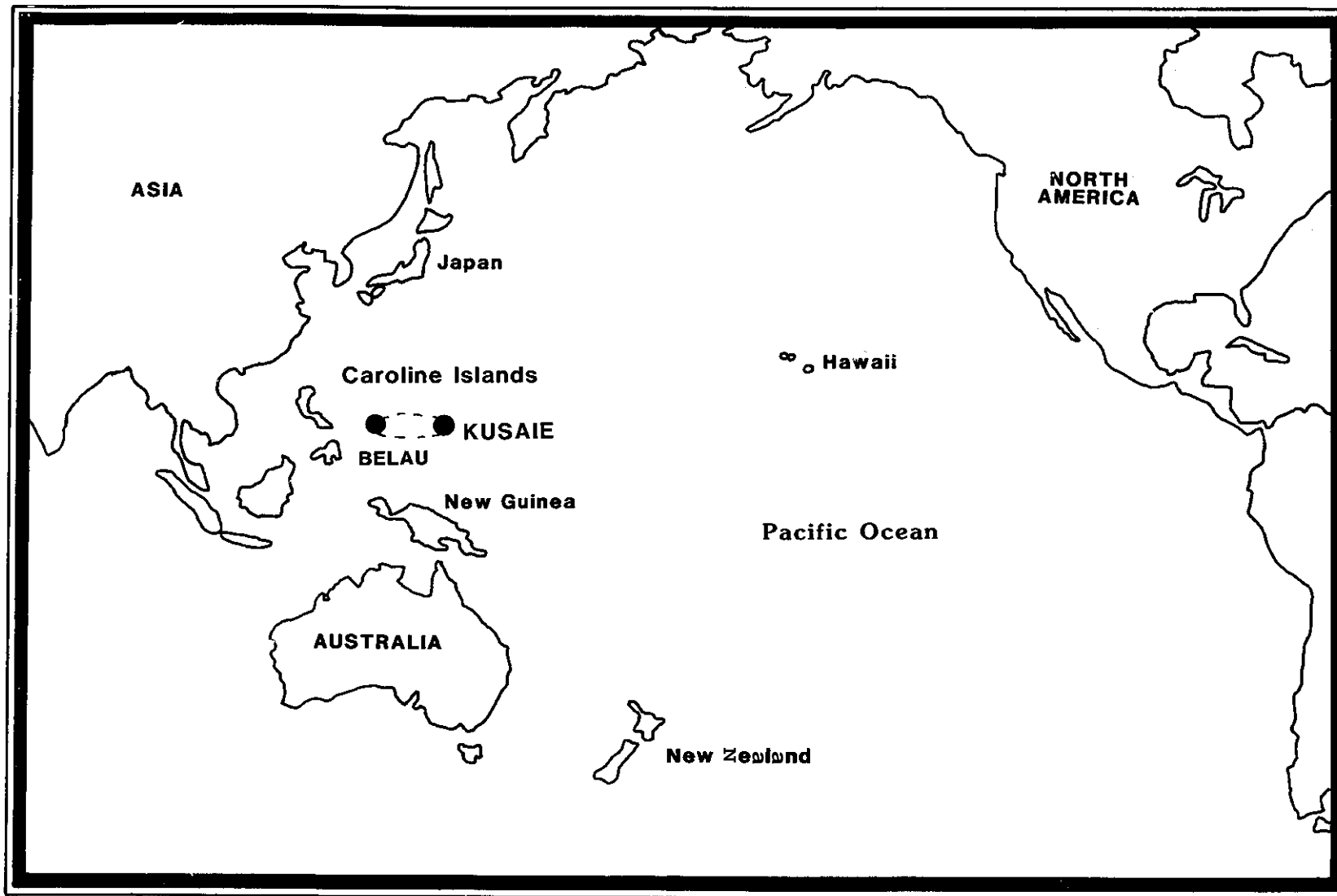


Fig. 2.5. Location of the Caroline Islands.

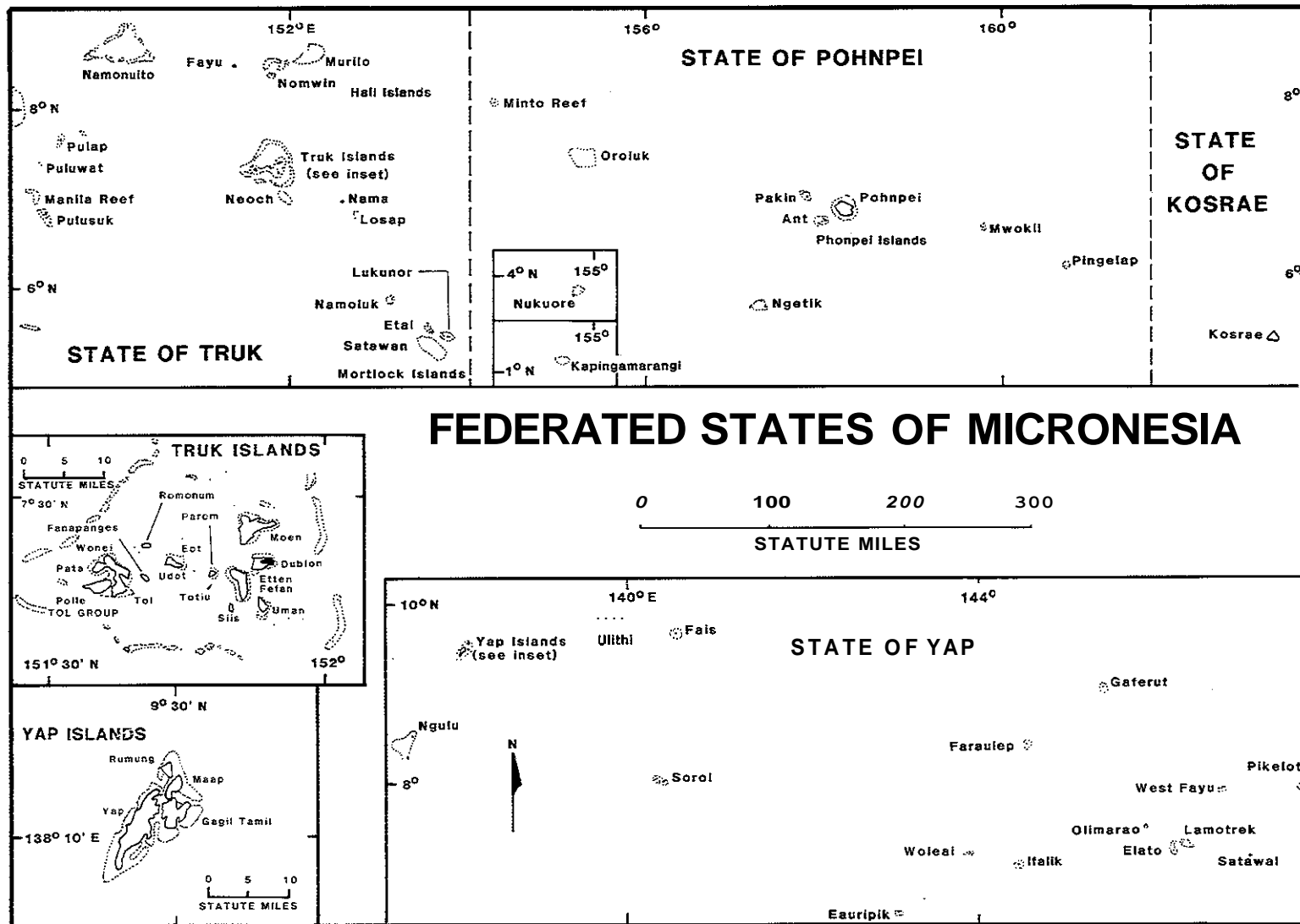


Fig. 2.6. Federated States of Micronesia.

roughly between Pikelot in the State of Yap and Manila Reef in the State of Truk (Figure 2.6).

The western Carolines included the archipelago of Belau, and the islands of Yap, Ulithi, Fais, Ngulu, Sorol, Eauripik, Woleai, Faraulep, Gaferut, Olimarao, Ifalik, Elato, Lamotrek, West Fayu, Satawal and Pikelot. They represent 23 island groups, atolls and isolated islands. The Eastern Carolines included Manila Reef, Pulusuk, Puluwat, Pulap, Namonuito, Necho, Truk Islands, Fayu, Nomwin, Murilo, Nama, Losap, Namoluk, Etal and Satawan, today all part of the State of Truk. The State of Pohnpei contains the remainder of the Eastern Carolines, which comprised Minto Reef, Oroluk, Nukuore, Kapingamarangi, Ngetik, Pakin, Ant, Paking, Pohnpei, Mwokil and Pingelap. Finally, the single island of Kosrae, today a separate state, formed the eastern boundary. Together these islands represent 25 island clusters and isolated islands.

Belau

Belau has been known as Palau, Arrecifos, Palaos, Palau, Pally, Paloc, Pannog, Parao, Pelew, Pelli and Walau. The archipelago is located between $8^{\circ}30'$ and $4^{\circ}30'$ north latitude and $131^{\circ}30'$ and $134^{\circ}30'$ east longitude. The capital of the group is Oreor (Koror), which is located approximately 4,000 miles southwest of Hawaii, 1,730 miles south of Japan and 1,300 miles northeast of New Guinea (Figure 2.7).

The islands stretch 71 miles north-northeast and south-southwest, with a maximum width of 20 miles (Figure 2.8). Ngcheangel (Kayangel) is 2 miles north of the outlying reef to the north and Ngeaur (Anguar) is $5\frac{1}{2}$ miles southwest of the chain. The islands consist of 8 large islands, 18 smaller ones, and numerous islets called Chelbacheb (the Rock Islands). From north to south the major features are Ngeruangel Reef, Ngcheangel, Babeldaob, Oreor, Ngererekesang (Arakabesan), Ngerchaol, Ngemelachel (Malakal), Chelbacheb, Ngemlis, Ngercheu, Ngedbus, Ngerrechong, Ngebad, Beliliou (Peleliu), Ngeaur (Angaur), Fana, Sonsorol, Pulo Anna, Merir, Tobi and Helen Reef.

The total land surface of the archipelago is 171 square miles of which more than two-thirds is Babeldaob (Department of the Navy 1944:11).

Marshall Islands

The Marshall Islands lie between $4^{\circ}30'$ and $14^{\circ}45'$ north latitude and between $160^{\circ}50'$ and $172^{\circ}10'$ east longitude. Jaluit, the administrative center of the islands, is 2,096 statute miles southwest of the Hawaiian Islands and 2,442

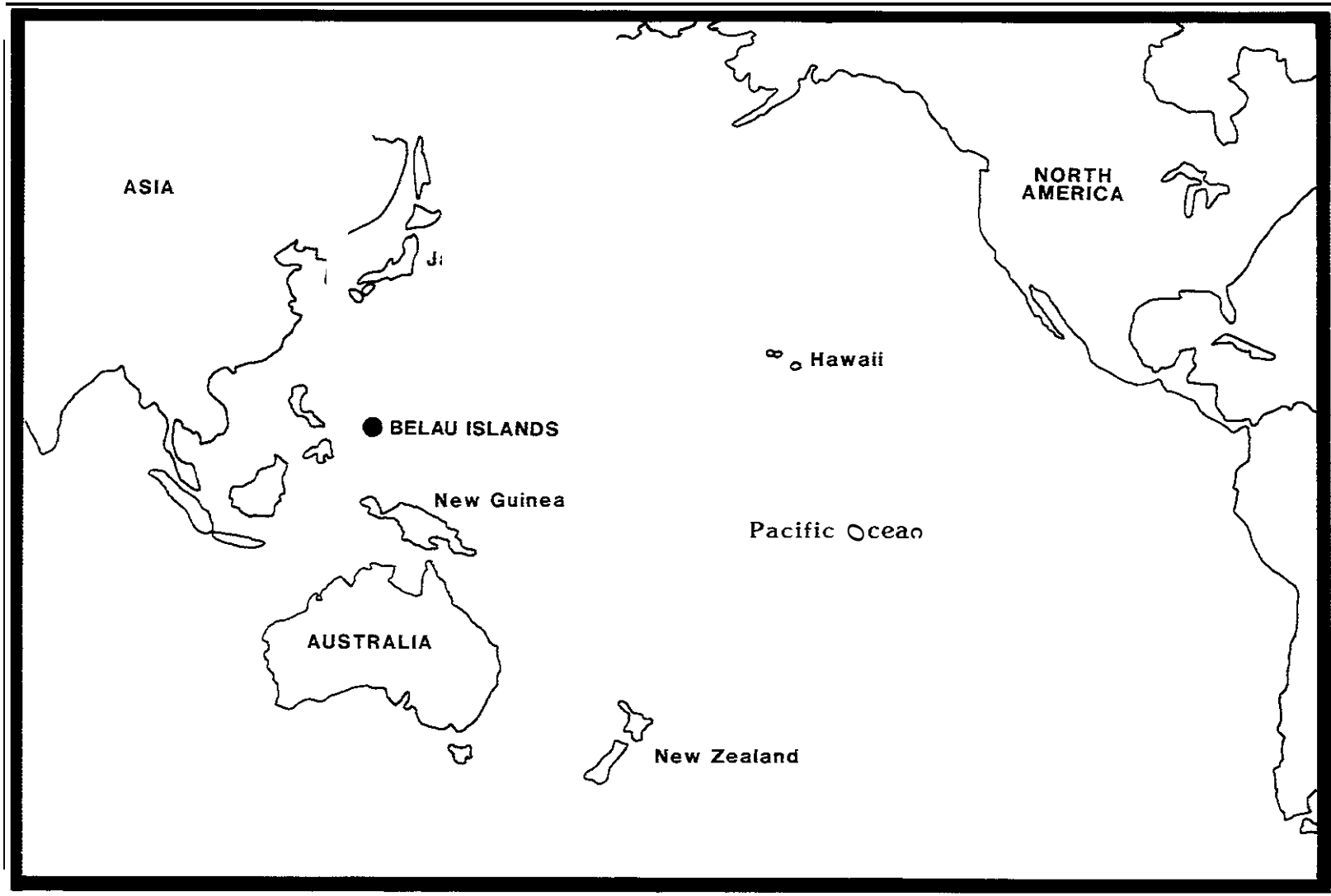


Fig. 2.7. Location of Belau (Palau).

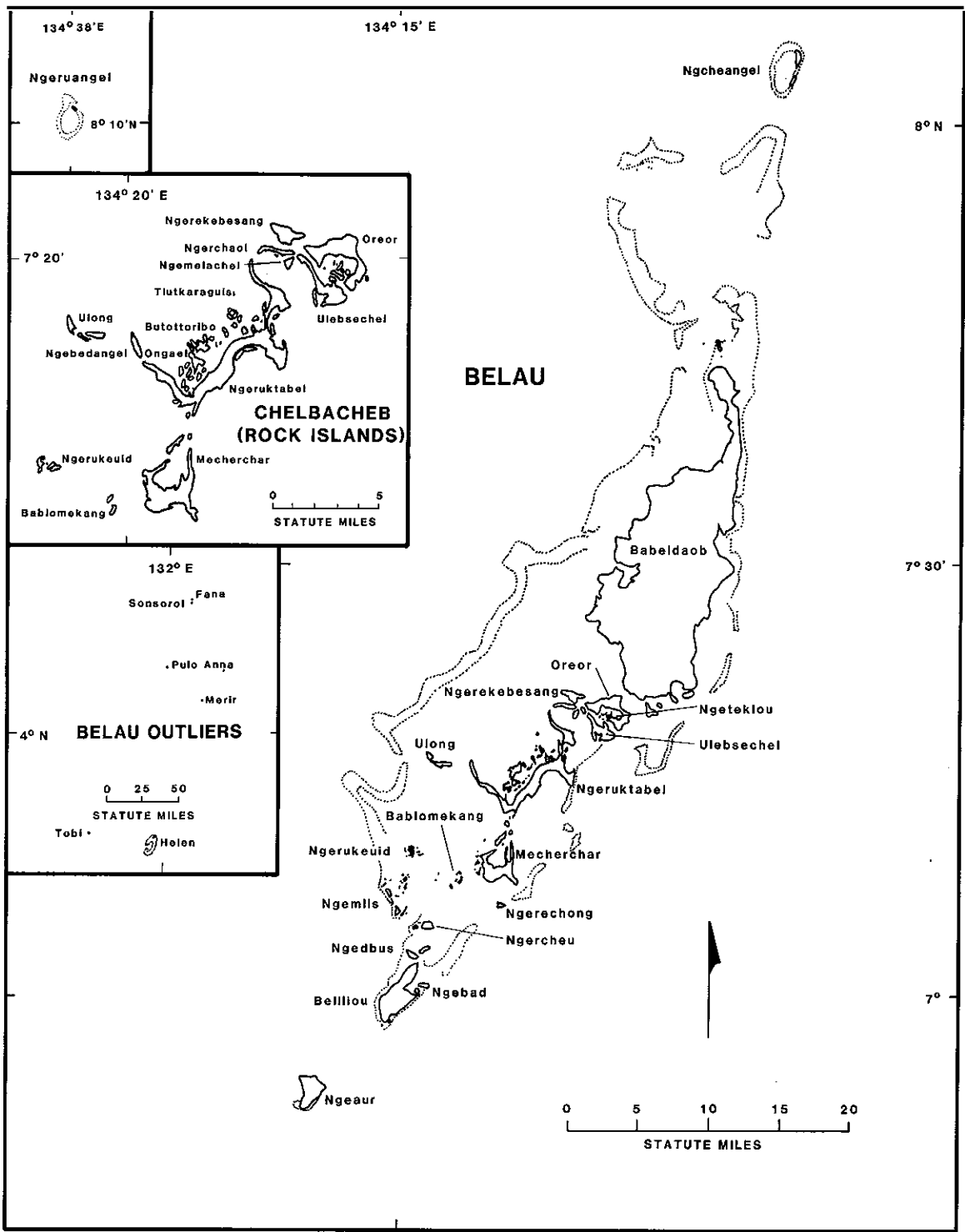


Fig. 2.8. The islands of Belau

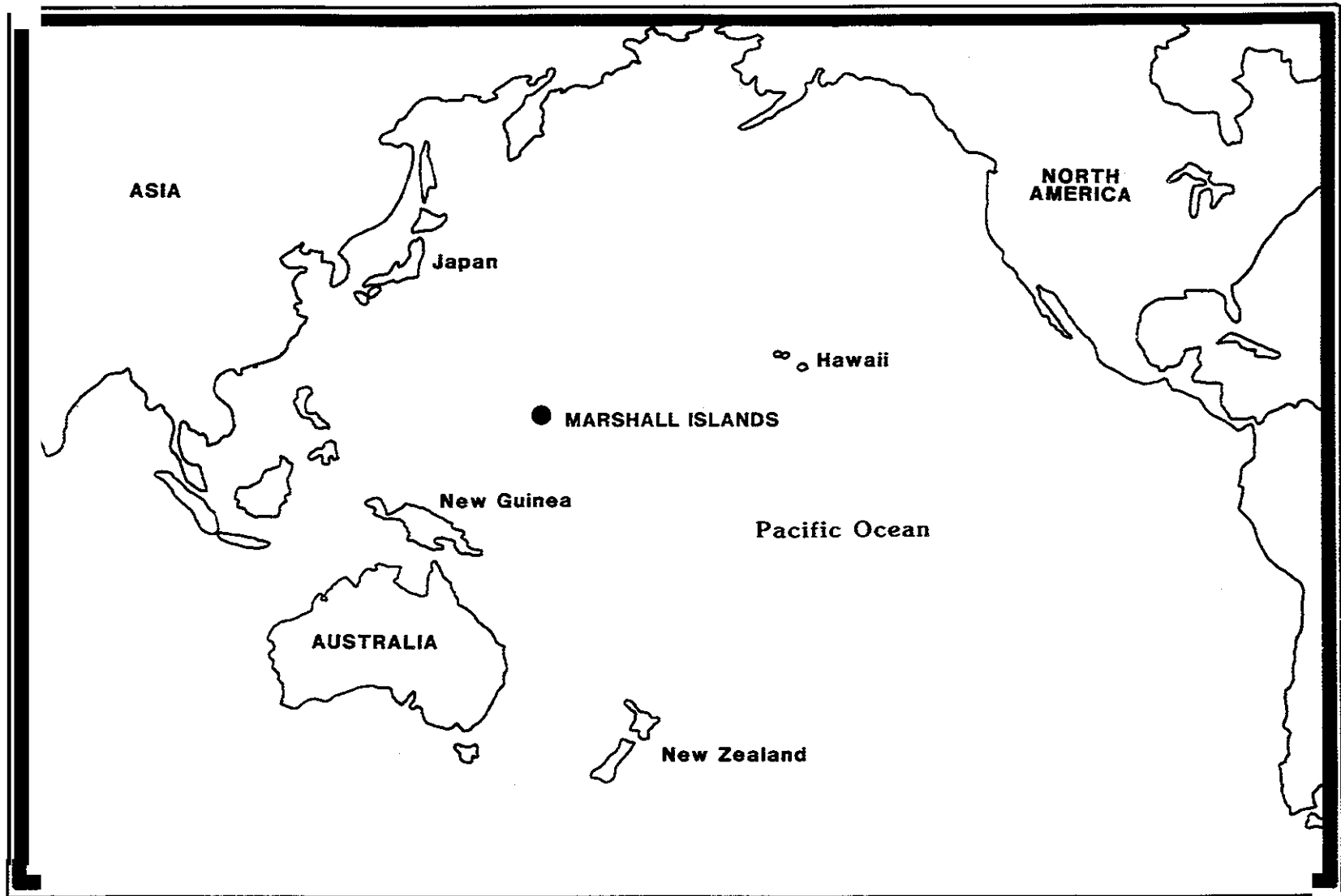


Fig. 2 B Location of the Marshall Islands

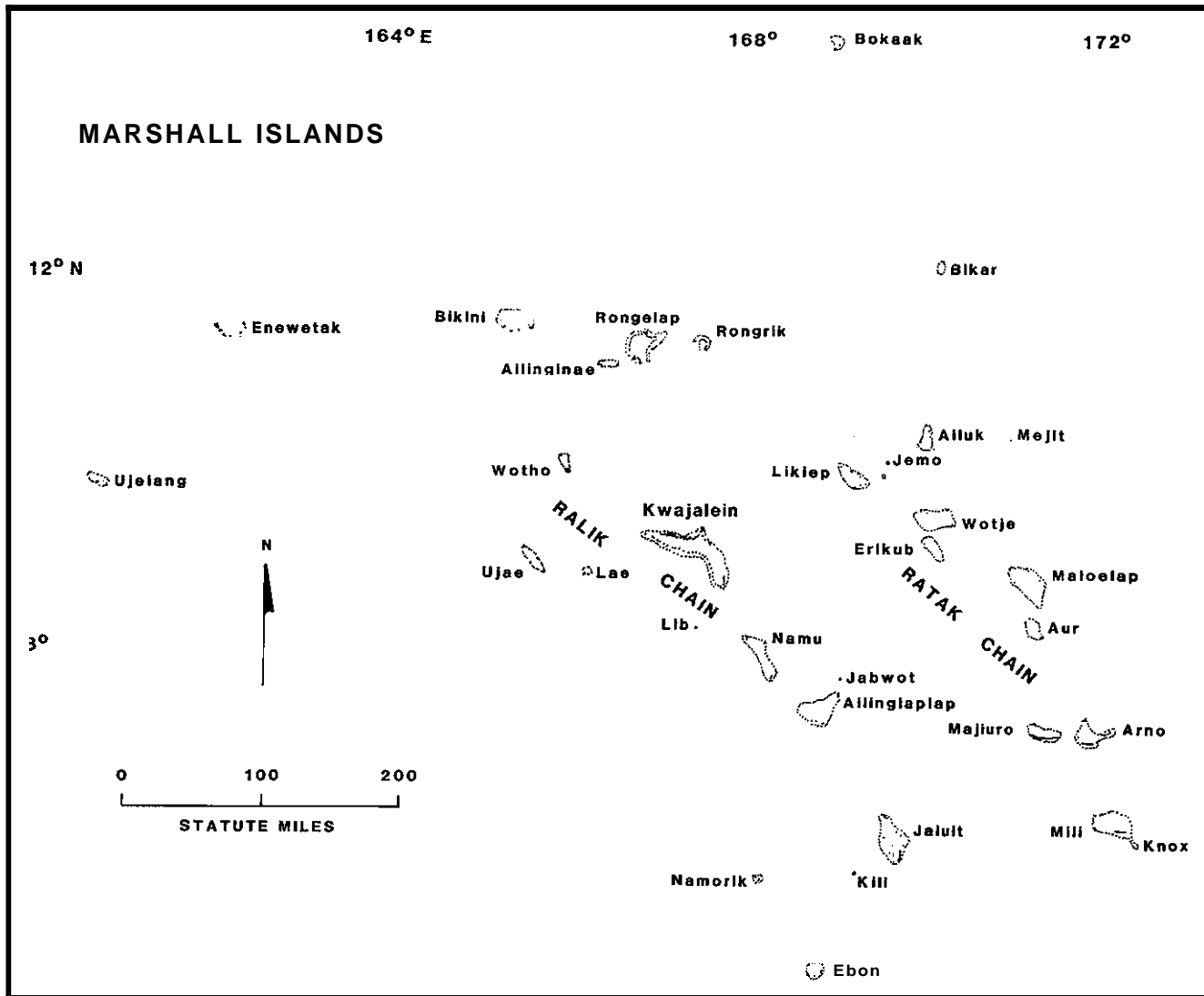


Fig. 2.10. The Marshall Islands.

statute miles southwest of Japan (Figure 2.9). The Marshall Islands are the eastward extension of the Caroline Islands, which reach west almost to the Philippines.

The archipelago consists of 34 low-lying coral atolls and single islands arranged roughly in two parallel rows (Figure 2.10). The Ratak chain, the easternmost in the archipelago, contains 14 atolls and 3 single islands. They are Bokaak, Bikar, Utrik, Taka, Mejit, Ailuk, Jemo, Likiep, Wotje, Erikub, Maloelap, Aur, Arno, Mili and Xnox (Narik). Approximately 130 miles west lies the Ralik chain, consisting of 15 atolls and 3 single islands. From north to south the islands are Enewetak, Bikini, Rongelap, Rongrik, Ailinginae, Ujelang, Wotho, Ujae, Lae, Kwajelein, Lib, Namu, Jabwot, Ailinglaplap, Jaluit, Kili, Namorik and Ebon. The average distance between islands in the same chain is 50 miles. In all, the archipelago occupies an area of 375,000 miles, 1-1/2 times the size of Texas, although the actual surface area of the land is only 74 square miles (Department of the Navy 1943:2). Historically, the islands have been referred to as Los Corrales, Marshall-Gruppe, Marschall Islands, and Marshall's Archipel, among others.

Kiribati (Gilbert Islands)

The Gilbert Islands straddle the Equator and lie between 2°30' north and 2°30' south latitude and between 169° and 178° east longitude. They are southwest of Hawaii, north of Fiji and southeast of the Marshall Islands (Figure 2.11). Today the islands are the western part of the independent republic of Kiribati (pronounced Kiribas). The Gilbert Island chain includes Makin, Butaritari, Marakei, Abaiang, Tarawa, Maiana, Abemama, Kuria, Aranuka, Nonouti, Tabiteuea, Beru, Nikunau, Onotoa, Tamana and Arorae (Figure 2.12). Together these islands represent 17 island clusters and atolls. Formerly known as Tungaru in Micronesian, and later the Kingsmill Islands, they became known as the Gilbert Islands in the 1820s.

Geologic Setting

The islands of the Pacific range in size from the world's second largest, New Guinea, to the smallest of reefs barely visible above the high tide line. In the entire Pacific, between the Hawaiian Islands and the islands from Japan to Indonesia, there are only three islands larger than 100 square miles. All three are within Micronesia: Guam (210 square miles), Babeldaob in Belau (153 square miles) and Pohnpei (127 square miles). The Pacific island land forms are one of four basic types: continental, volcanic, low

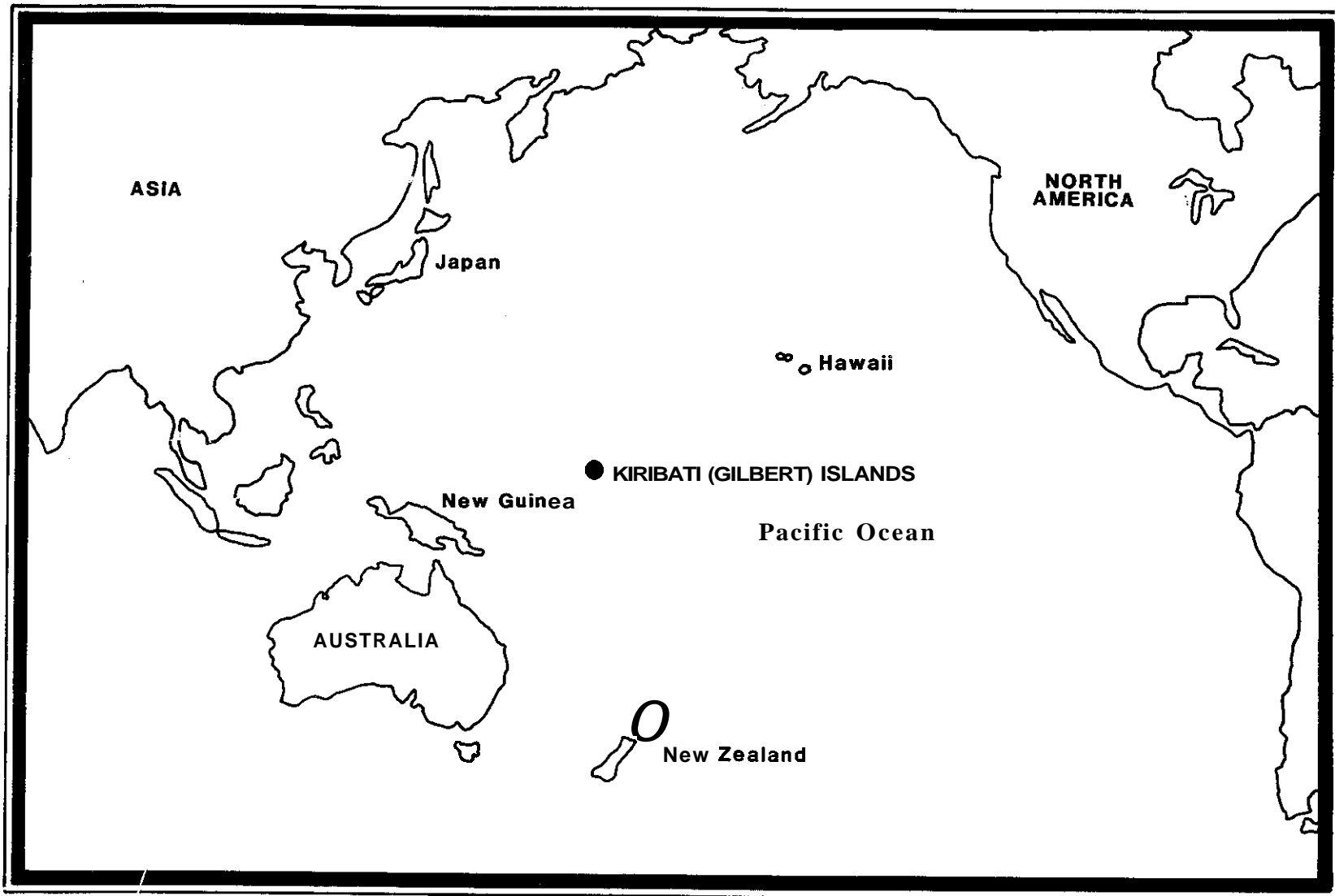


Fig. 2.11. Location of Kiribati (Gilbert) Islands.

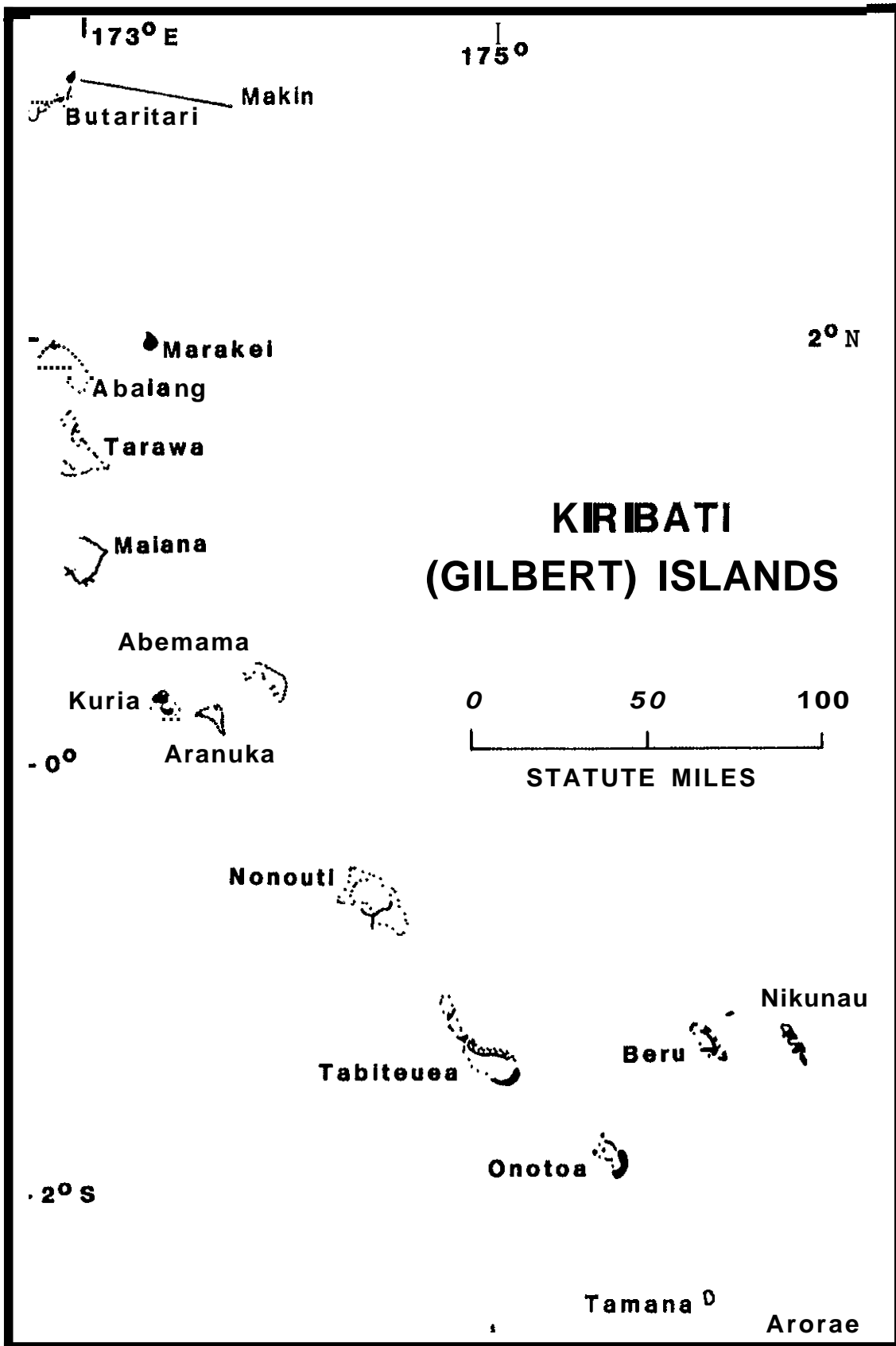


Fig. 2.12. The Gilbert Islands in the State of Kiribati.

coral and raised coral islands. Each of these is represented in Micronesia (Thomas 1967:6-8).

Island Types and Land Forms

The continental islands are the largest in the Pacific and include New Guinea, Fiji and Japan as well as Babeldaob and Yap in the western Carolines. These islands are distinguished by the presence of continental rock formations rather than volcanic or coral. The islands exhibit great topographical variety, such as heavy forests, grasslands and swamps, deep canyons, broadly sloping valleys and flat flood plains. Continental islands can support a larger and more diversified flora and fauna and are capable of supporting large populations.

Some of the best known of the volcanic-type islands are the Hawaiian Islands, still active today. These high islands, scattered throughout the Pacific, are often thousands of feet from ocean floor to peak and contain large deep valleys with precipitous cliffs. The inactive cones form natural amphitheaters that rise from a nearly flat floor or form mountain-enclosed harbors. Erosion has resulted in soils capable of growing a wide variety of foodstuffs including coconut, breadfruit, plantain, taro, sweet potato and numerous fruits. Generally small to intermediate in size, the islands are often ringed by either fringing or barrier reefs.

The volcanic islands in Micronesia were often the most frequently visited by Europeans and were the major population centers because, like continental islands, they could support large populations. Five islands in the Caroline Islands are volcanic in origin: Kosrae, Pohnpei, Truk, Oreor (Koror) and Ngemelachel (Malakal). The 14 Mariana Islands are also volcanic in origin. Truk and Pohnpei consist of more than a single island and each have varying complexity in land form and reef structure.

The most numerous type of land form in the Pacific is the low coral island. Generally very small in area, they are widespread and are typified in Micronesia by many of the Gilbert, Marshall and Caroline islands. Generally classified as atolls, these islets are usually not more than 5 to 10 feet above high tide. Formed of organic limestone and the accumulation of limestone debris on top of an underlying volcanic mountain or cluster of cones, they typically form a ring-like ridge or reef enclosing a shallow lagoon. The only source of fresh water is rainfall and, because the sea can easily inundate the land, these islands are often treeless and uninhabited.

The raised coral island, originally a coral atoll, is distinguished from its low-lying predecessor by its having been raised up by a succession of uplifts or other geologic events. Typical of these islands is a depressed island center, all that remains of the ancient lagoon. Very often the island drops off from steep cliffs with a narrow shelf. Rare in the Pacific, some raised coral islands are rich in ore phosphate. Ngeaur (Anguar) and Fais in the western Carolines, Banaba in Kiribati, and Nauru are examples of raised coral islands in Micronesia (Thomas 1967:1-11; Department of the Navy 1943, 1944).

Climate, Prevailing Winds and Currents

Micronesia has a tropical oceanic climate with comparatively high, uniform temperatures. The annual mean temperature on Saipan in the Mariana Islands is 78°F. The mean on Yap and Oror (Koror) in the western Carolines is 80°F and 81°F, respectively, and on the eastern Caroline Island of Pohnpei the mean is 81°F. The annual mean in the Marshall Islands is 81°F and the southerly Gilbert Islands have a mean of 84°F (Department of the Navy, 1943, 1944; Douglas 1989:288). The comparatively large water area to small land area moderates year-round temperatures and keeps the seasonal variation to no more than 4° or 5°.

All the islands experience high humidity, heavy rainfall, and seasonably high winds. Rainfall varies with the trade winds and the monsoons. The rainy season is July to October or November, although rain does occur throughout the year. Tropical cyclones are regular weather events and average 130 per year (Ward 1966(I):20). They vary greatly from moderate to violent typhoons, normally moving westerly and north or westerly and south until they dissipate.

Prevailing winds, a determining factor in both the discovery of the islands and later in interisland and island-mainland trade, play a controlling role in the climate. Because much of Micronesia lies north of the equator, the trade winds blow predominantly from east to west, which results in wet, cloudy windward coasts on the high islands and cloudless and dry coasts on the leeward side (Thomas 1967:13). Unlike the dependable trade winds that cover nearly the entire Pacific, the monsoons are limited to the area north of New Guinea and Australia to the Asian mainland. They are characterized by seasonal reversals of winds and affect only the westernmost islands in Micronesia.

Near the equator, and affecting mostly the Gilbert Islands, are the doldrums. The temperature variation in this region

is only 2° to 3° annually and rainfall occurs throughout the year. This region is also characterized by high humidity, considerable cloudiness and low wind speeds, which often result in brief, violent squalls and waterspouts (Thomas 1967:13; Ward 1966(I):20). The southeast trade winds are below the equatorial doldrums.

North and south of the easterly trade winds, in the latitudes of 30° to 60°, are the westerlies, the winds that pushed the sail-rigged canoes and ships of early seafarers back across the Pacific to the Americas.

The ocean currents, like the prevailing winds, move from east to west through much of Micronesia. The most powerful are the north and south equatorial currents that match the easterly winds. Moving across thousands of miles of open ocean, these strong currents are forced to turn both north and south once they hit the large land forms of Australia and mainland Asia. Part of the water flows eastward in the narrow belt called the equatorial countercurrent, which is twice as strong during the northern summer (Ward 1966(I):22). It is the combination of east and westerly winds and currents that made migration, exploration and trade possible in the Pacific.

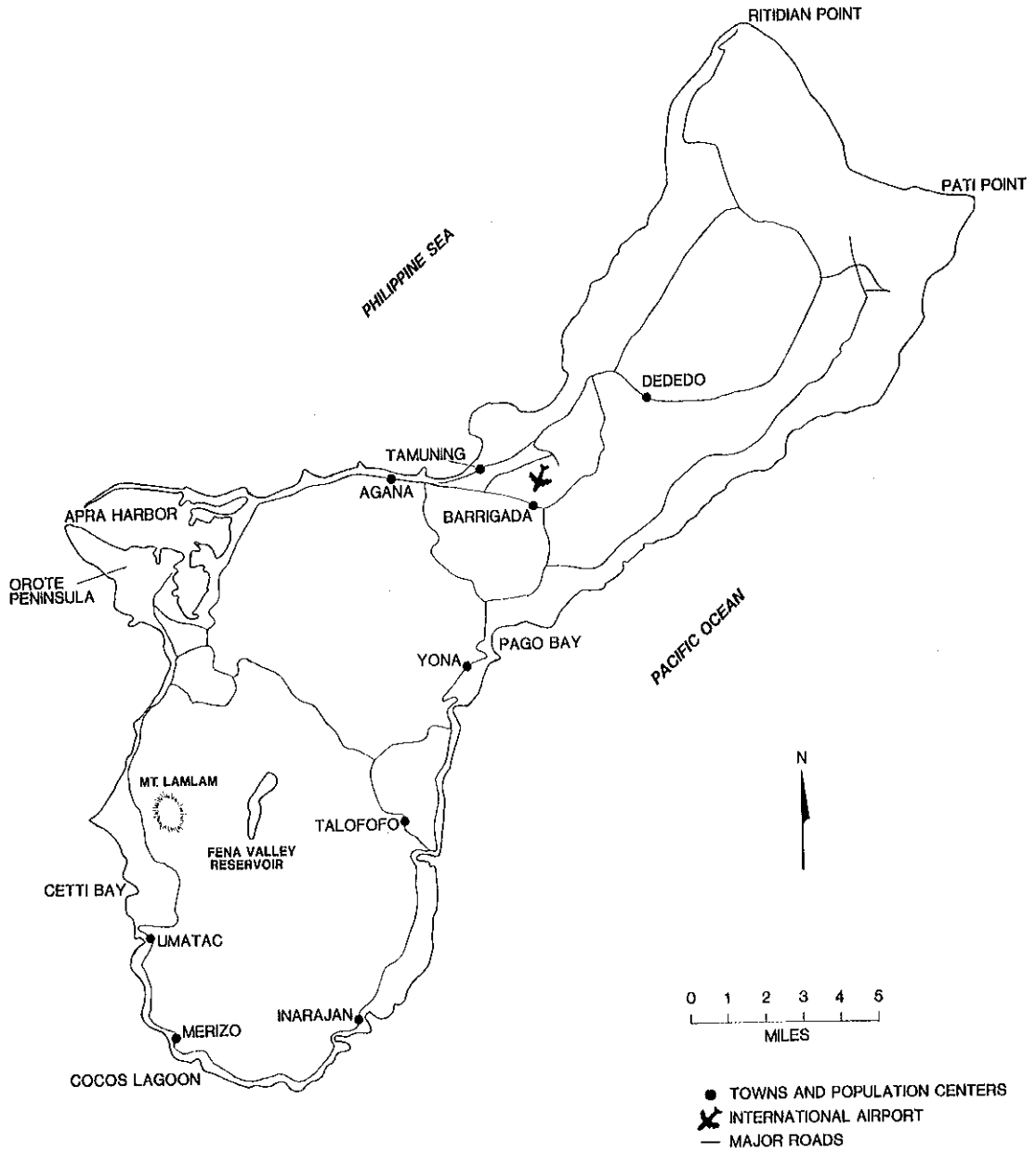
The Study Areas

Although this assessment has made an effort to address the complete range of Micronesia's submerged cultural resources, it was not possible to undertake field research at each island. Only a relative handful of islands had field work completed (refer to Chapter 1). Additional geological information on a few locations where field work was completed is presented below to better orient the reader to their features.

Guam

The northern half of the island is a limestone plateau ringed by cliffs 500 to 600 feet high. The island's southern half is a range of volcanic mountains and hills paralleling the west coast, rising steeply to more than 1,000 feet above sea level and sloping gently toward the east. The coastline varies with location, from pitted, emerged coral limestone to low, swampy lands or sandy beaches. Pillow lavas and dikes are also exposed in many places.

A number of bays and anchorages ring the island (Figure 2.13). Umatac Bay, on the southwest, may have been the location where Magellan made his first landfall in the Pacific. Merizo and Inarajan on the south and Talofofu and



ISLAND OF GUAM

Fig. 2.13. Harbors and bays on Guam.

Pago on the east have been used in the past for shipping or as refuges from adverse conditions.

Guam's major port is Apra Harbor on its west coast (Figure 2.14). Protected on the south by Orote Peninsula and on its north by a manmade breakwater extending from Cabras out across a natural reef, the harbor is 150 feet deep at its maximum. Although several shoals are present, they are confined to the eastern end of the outer harbor. Apra has been modified as a result of the construction of U.S. military facilities and dredging of both the outer and inner harbor to accommodate naval vessels; fortunately, much of the main harbor has been little impacted.

Fringing reefs less than 3,000 feet from the beach surround most of the island. Beyond the reef, the ocean floor drops quickly to great depths; the Marianas Trench, 60 miles off the southern tip of Guam, is recorded as 35,810 feet deep.

War In the Pacific National Historical Park²

War in the Pacific National Historical Park, as now authorized, consists of seven physically separate units lying on the western side of the island. They are between the west end of Agana and the south end of the village of Agat. Of the seven units in the park, only two are associated with offshore areas. These are the Asan Beach Unit and the Agat Unit (Figure 2.15).

Asan Beach Unit: Encompassing 445 acres offshore, this unit includes all lands on the ocean side of Marine Drive between Adelup Point and Asan Point. Except for the limestone promontories of these two points, the land is a flat, coastal plain with a sandy beach, 15 to 30 feet wide, fronting the shoreline. The offshore area encompasses extensive reef formations, up to 1,000 feet wide, paralleling the shoreline. Water inside the reef varies from 1 to 4 feet deep and during low tide many areas of the reef are exposed. There is one small islet, Camel Rock, near Asan Point.

The coral community dominates the Asan Unit waters. Seagrass (Enhalus acoroides) is found in widely scattered patches east of Adelup Point. Corals are widely scattered to abundant in the low-tide moat along the inner reef flat. The densest corals are found immediately west of Adelup Point and seaward

²The section on War in the Pacific National Historical Park was written by James Miculka and Rose S.N. Manibusan.

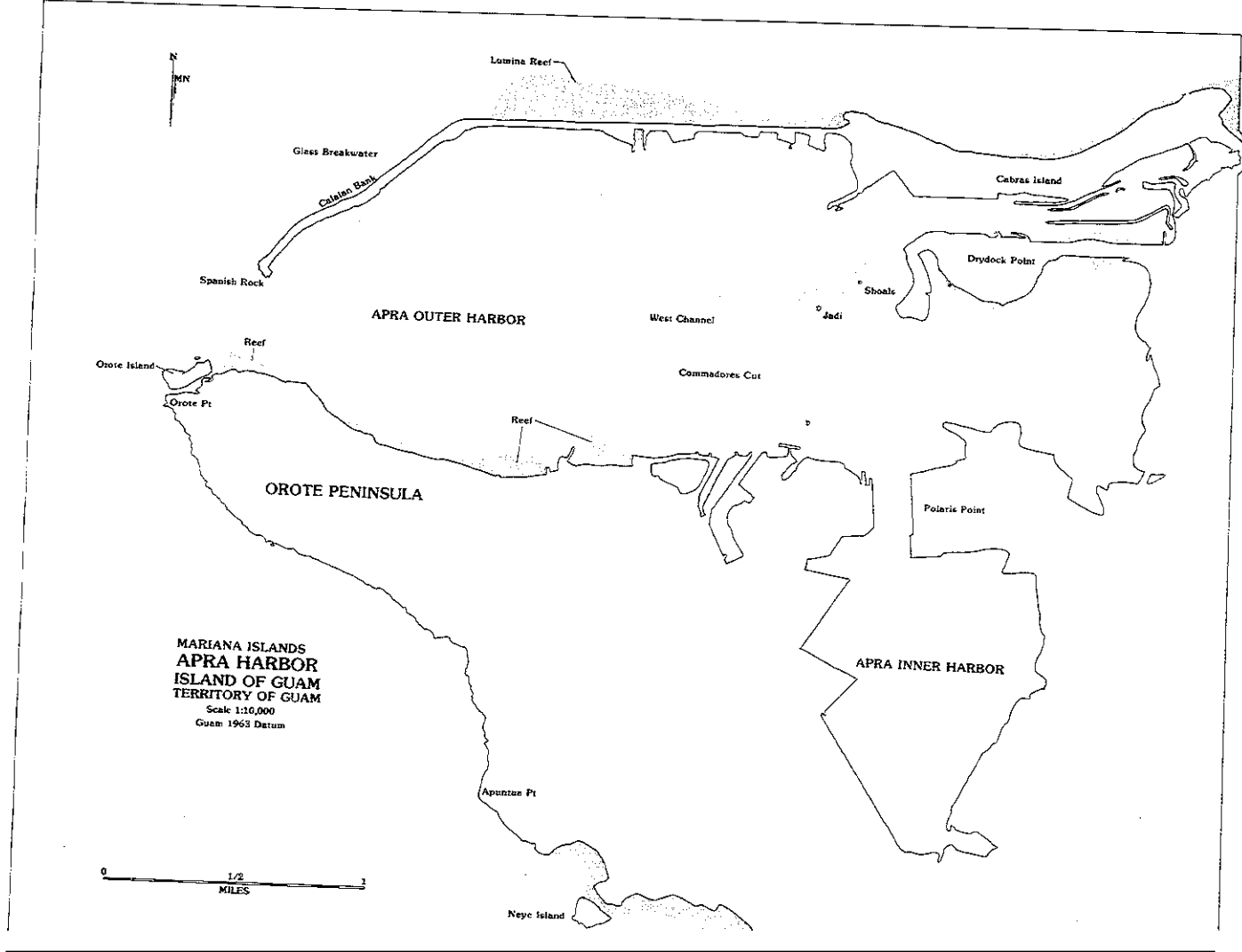


Fig. 2.14. Apra Harbor, Guam.

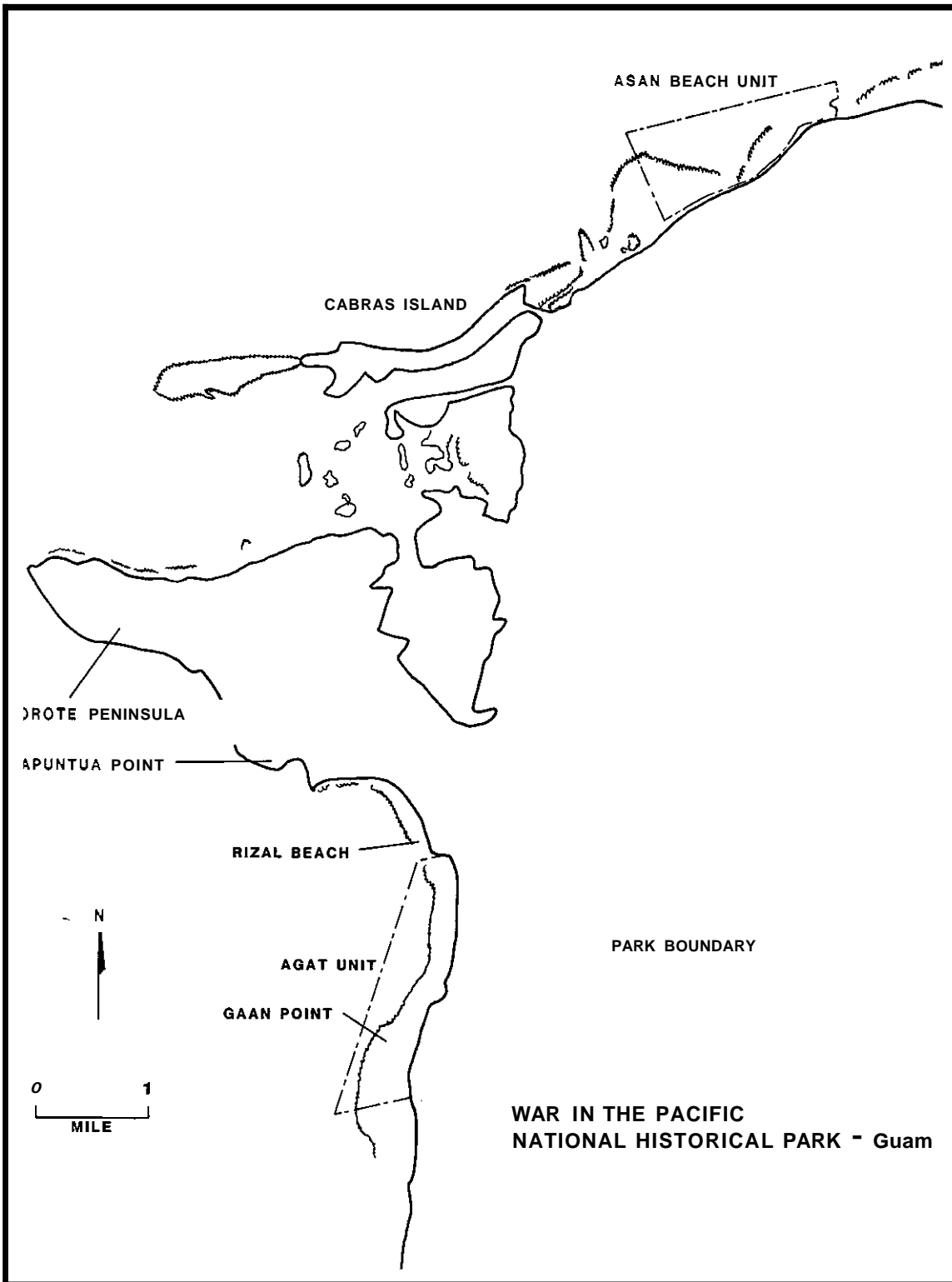


Fig. 2.15. Location of Agat and Asan Units, War in the Pacific National Historical Park, Guam.

of the raised coral headland. Abundant areas of soft corals are found west of Asan Point.

A wide variety of invertebrates has been observed, especially sea cucumbers, sea urchins and sea stars. Fiddler crabs (Ucu) have been collected along the sandy beach at the Asan River mouth.

It was on this shore that the 3rd Marine Division came ashore on July 21, 1944, for the initial assault and was met by troops of the Japanese 320th Independent Infantry Battalion. The invasion was in support of the recapture of Guam.

Agat Unit: This is primarily a water area covering 557 acres offshore. The land is a series of small parcels between the coastal road and shoreline. Terrain is composed generally of coral outcroppings interspersed with low-lying areas. A coral reef parallels the shoreline and extends from 1,000 to 1,500 feet from the beach. Four offshore island groups (Pelagi Islets and Yona, Bangi and Alutom islands) are bordered by low limestone cliffs and sloping shores. Water inside the reef is 1 to 4 feet deep, and during low tide some of the reef formation is exposed.

Extending from north of Rizal Beach to the south of Bangi Island, the intertidal beaches at Rizal Beach, Togcha Beach and Salinas Beach to the south are composed primarily of bioclastic material. Some volcanic detrital debris is especially common near the mouths of the numerous streams that enter along the coast. Low limestone cliffs with sea-level coral boulders border Apaca Point south of Rizal Beach. The sewer outfall peninsula at Gaan Point is the only artificial shoreline in this unit. Sea walls and a slightly altered shoreline also occur at Rizal Beach.

The reef flat widens generally towards the south from a width of 172 feet at Rizal Point to 2,651 feet south of Gaan Point. At the north end of the Agat Unit, an intertidal reef flat with scattered depressions grades to the south into an irregular inner reef flat and low-tide moat south of Apaca Point. The inner reef flat is interrupted at Gaan Point by the manmade peninsula. The outer reef flat is cut by depressed channels at Togcha Beach and south of Gaan Point. Alutom Island lies on the outer reef flat margin to the south.

The reef rock of the inner reef flat is generally veneered with patches of silt, sand, gravel, coral-algal-mollusk rubble and scattered boulders. Scattered boulders are also found on the outer reef flat pavement where depressions contain some sand. An accumulation of coral boulders into a

boulder tract partially divides the inner reef flat just north of the Togcha River area.

The major marine community throughout the Agat Unit is the seagrass (*Enhalus acoroides*) community. Rare at the north end near Rizal Beach, seagrass becomes more abundant in the low-tide moat that begins at Apaca Point. Southward the seagrass increases, especially seaward of the Togcha River and Bangi Point. Corals, widely scattered throughout the Agat Unit, are more abundant in the low-tide moat. Only a few corals are found on outer reef flats except for those in small holes and depressions. A wide assortment of invertebrates and fish is known to inhabit the unit.

The reef flat at Rizal Beach is composed principally of coral rubble. The alga *Padina tenuis* is prominent and sponges (*Cinachvra australiensis*) are scattered. Many gastropods are present as is the sea urchin *Echinometra mathaei*.

South of Pelagi Islets, the reef pavement becomes substrate for animals such as the sea cucumber (*Holothuria atra*), sea urchin (*Echinometra mathaei*), and a few crustaceans. A number of gastropod species have been observed. Farther south the shore is littered with domestic trash, and the ghost crab (*Ocypode ceratophthalmus*) is found. At the north side of the peninsula at Gaan Point, the snail (*Cerithium moras*) is found in great abundance.

The Agat Unit is the site of the southern invasion beach. It was here that the First Provisional Marine Brigade and the 305th Regimental Combat Team of the 77th Army Division came ashore. They were met by the Japanese First Battalion, 38th Infantry.

Rota

A 1,168-foot peak just northeast of Rota village is all that remains of the extinct volcano that formed this island (Figure 2.16). A second peak in the northwest area of the island rises to 1,612 feet then drops off dramatically to a plateau that extends to the northeast end of the island. Terraces are present to the west, south and east of the mountains. An isthmus on the extreme southwest end of the island is capped by a flat-topped plateau called Taipingot. The plateau rises 469 feet and has sheer cliffs and horizontal terraces. Topographically, the interior of the island is a combination of terraces and plateaus bordered by limestone cliffs. Rock formations are basalt, tuffite and coral limestone (Department of the Navy 1944:11).

Despite the limited running water on the island, the interior plateaus and terraces are covered with a thick growth of

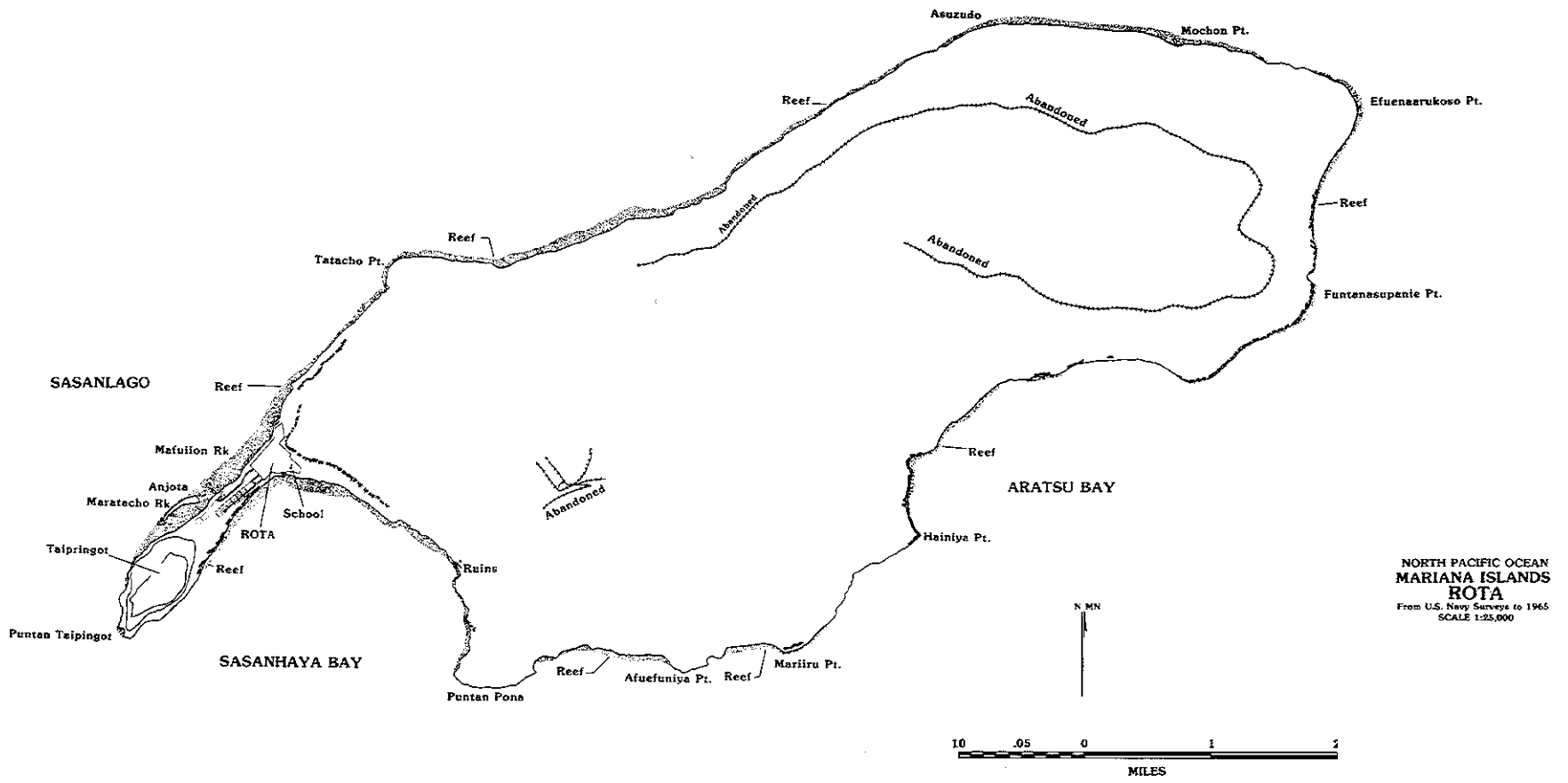


Fig. 2.16. Base map of Rota.

vegetation including coconut palms, breadfruit trees, pandanus and some savanna grasses (Department of the Navy 1944:11).

The coast is steep and inaccessible except for the sandy isthmus connecting Taipingot to the main body of the island. Nearly surrounded by rocks and coral reefs, Rota's major bays are Sasanhaya and Aratsu on the southwest and south sides, respectively, although the most commonly used anchorages are Sasanhaya and Sasanlago on the northwest.

Saipan

The dominant topographic feature is an axial upland area extending through the northern three-fourths of the island (Figure 2.17). The northern, eastern and southern coastlines exhibit moderate to steep slopes and cliffs. Lowlands run parallel to the shore along the western coastline.

Saipan has a combination of barrier and fringing reefs along most of its coast. Major coastal habitats include beaches, rocky shores, salt ponds and lakes, mangroves, coastal strand, limestone forest, volcanic forest, offshore islets, and disturbed and urban areas. A barrier reef runs along nearly 90 percent of the 13.5-mile length of the western shoreline and forms Saipan Lagoon. Several areas have been identified as critical ecological zones that deserve special consideration because of ecological uniqueness, high productivity or stress.

The island is situated within a seismically active zone that is common to the other Mariana Islands. Many earthquakes of low magnitudes occur throughout the year. The earthquake history of Saipan since 1800 indicates that two major tremors occurred during 1849 and 1902; their magnitudes are not known. Based upon historical earthquake data for Guam, earthquakes on the magnitude of 5.0 to 6.0 (Richter Scale) could be expected.

American Memorial Park³

The park is located on Puntan Muchot on the western side of the island: its 133-acre topography is essentially flat (Figure 2.18). The highest elevation is about 10 feet above mean sea level. Along the west, the park is bounded by 2,500 feet of Micro Beach. Snorkeling, windsurfing, wading and

.....

³The section on American Memorial Park was written by James E. Miculka and Rose S.N. Manibusan.

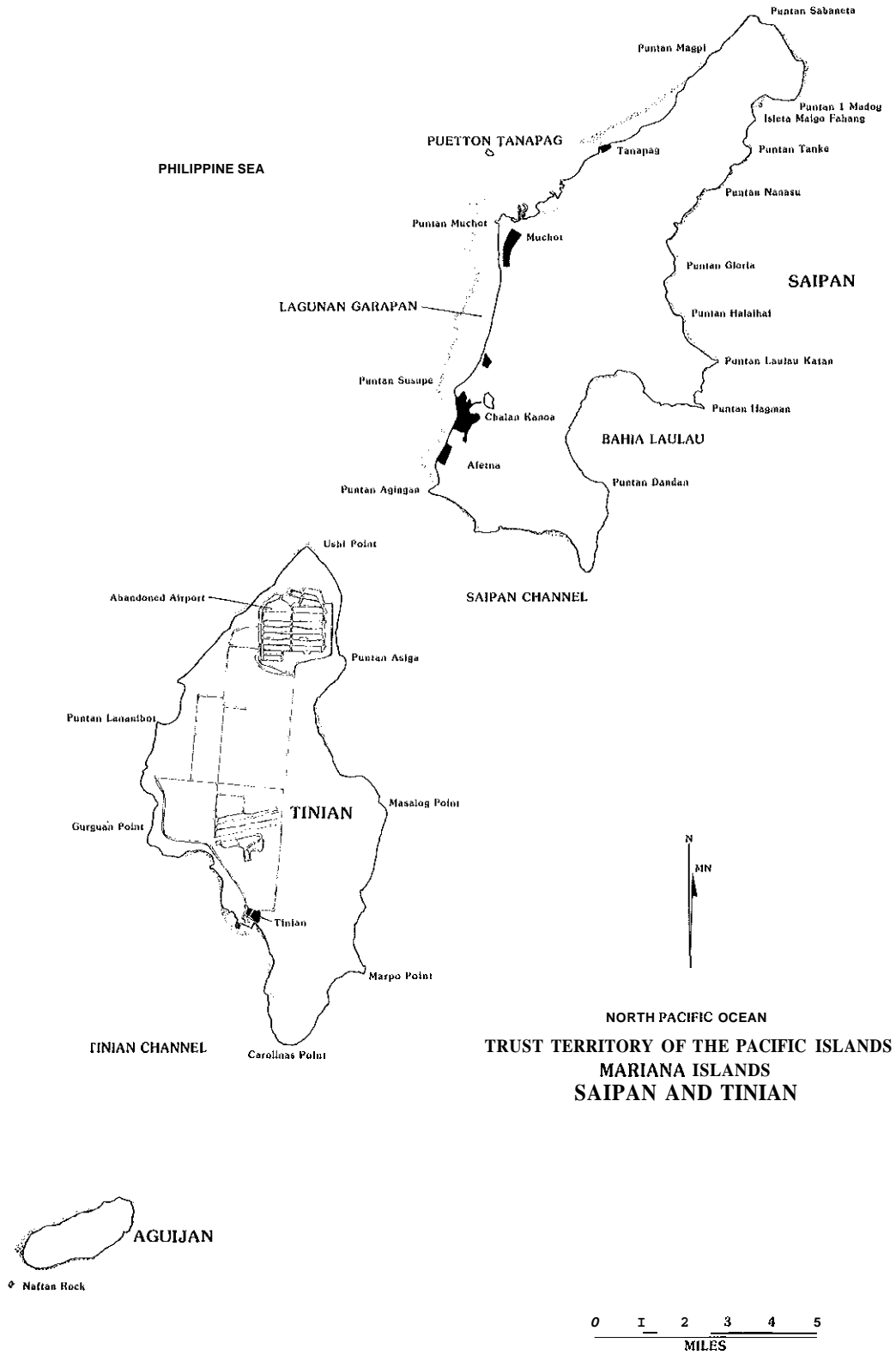


Fig. 2.11. Base map of Tinian and Saipan.

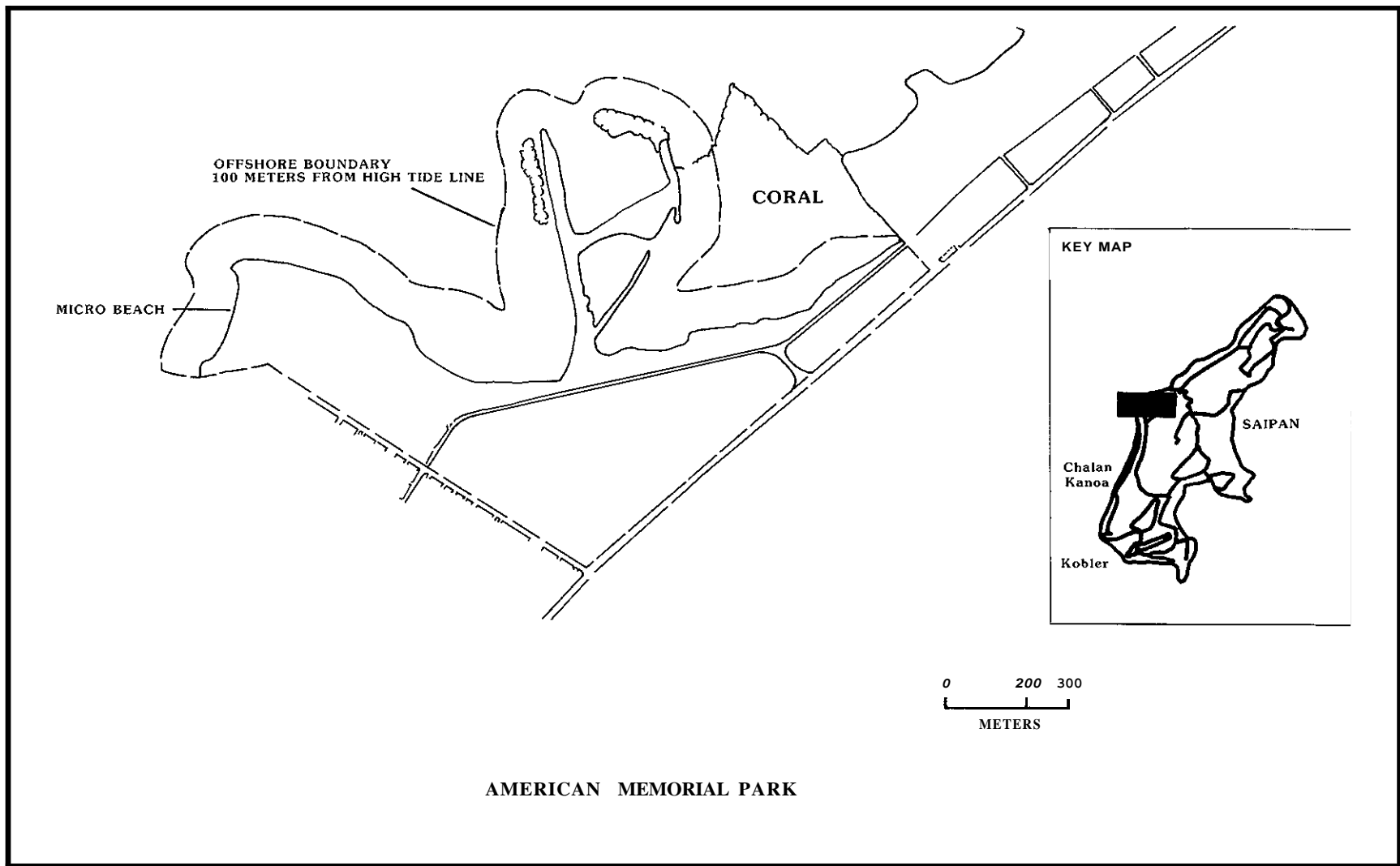


Fig. 2.18. Location of American Memorial Park, Saipan.

fishing are common activities in the wide, shallow lagoon fronting the beach.

Along the north, a boat harbor and dredged access channel, created during the war, provide sheltered moorage for private and commercial boats including glass-bottomed tour boats now operating out of the park. These tours show visitors coral reefs and World War II wreckage on one-day excursions to Managaha Island, a small 15-acre island across the lagoon. This small harbor, protected somewhat by a Y-shaped breakwater, offers the best small-boat protection from typhoons on Saipan.

The east side of the park is a wetland--one of the few native wetland forests on Saipan. Native trees include Bruauiera, Thesperia and Hernandia. The native fern Acrostichum is abundant in the higher areas. The wetland is an excellent habitat for native birds. Elsewhere the park is grassland with scattered "flame" trees, a widely planted ornamental on the island. Grass areas are maintained by mowing to prevent the alien and aggressive shrub, Tanaentanaen, from overrunning all open areas.

Kosrae

This small, picturesque, volcanic island is the easternmost in the Carolines (refer to Figure 2.2). Today a separate state within the Federated States of Micronesia, it covers an area of **42** square miles and is 8 miles in diameter (Figure 2.19). Topographically, it consists of the lofty main island, called Ualan, Lele Island and eight low coral islets.

Lele is dominated by a 354-foot peak in the east and a low western portion that is artificial, that is, manmade. Ualan Island is crossed from east to west by a valley, which separates it into two unequal parts. The smaller northern portion is overlooked by a 1,911-foot peak while the larger southern portion culminates in Mt. Crozer, more than 2,000 feet in elevation. The interior of the island is basalt, typified by steep, rugged topography cut by mountain streams. Densely forested, the area is almost impassable.

The narrow coastline, less than a kilometer wide, is flat and sandy in the north and east and overgrown with mangroves on the south and west. Fields and settlements are located along the coast, on the smaller islands and in the transverse valley. In the past, communication was possible only by small boats that circumnavigated the island in a channel that separates the fringing reef from the shore. The fringing reef almost encircles the islands at distances ranging from a few yards to a mile from shore. Passages through the reef provide access to the island's harbors, the best of which is

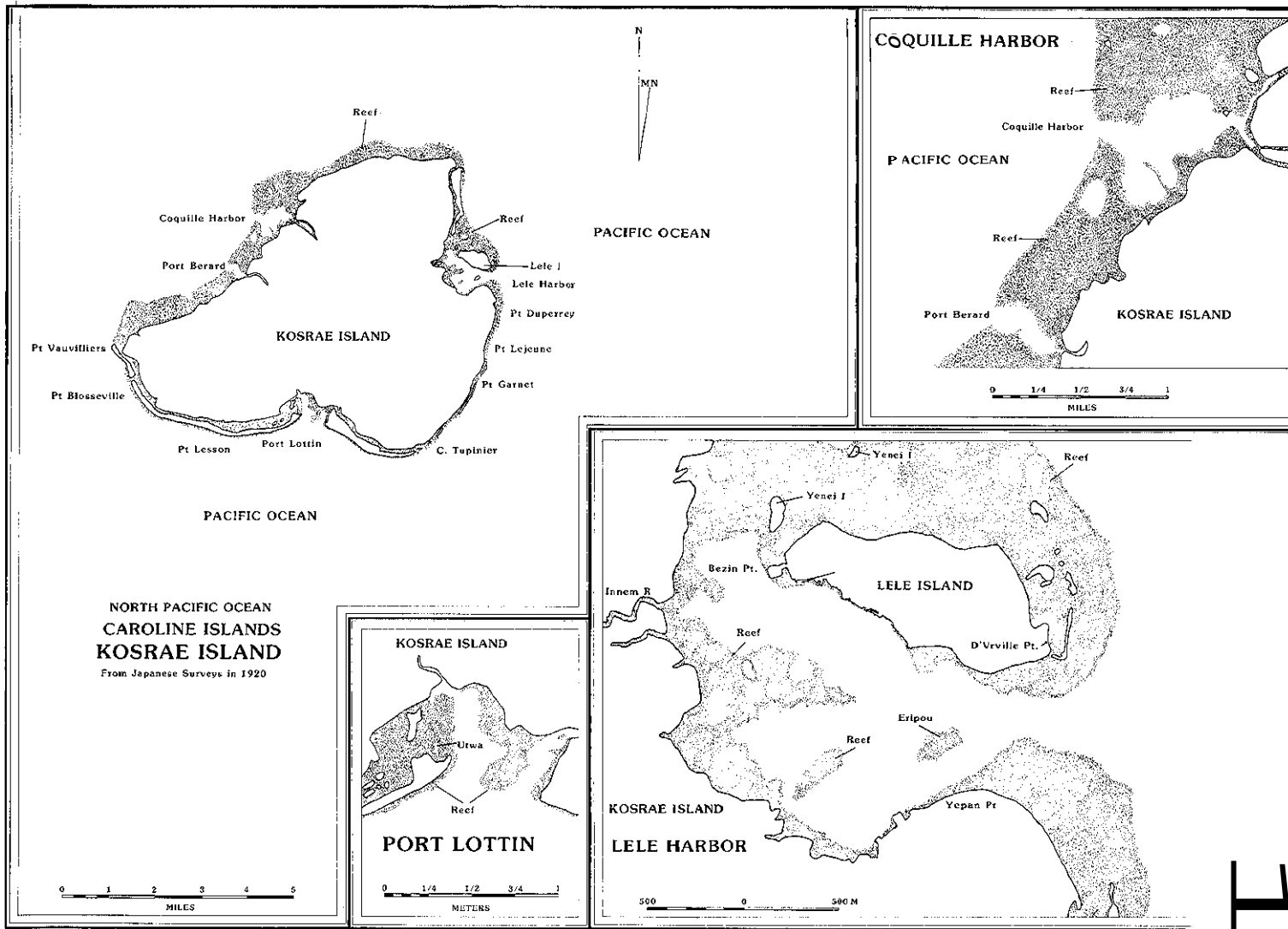


Fig. 2.19. Base map of Kosrae.



Lele on the east. Others are Port Lottin in the south, Port Berard and Coquille Harbor, both on the west (Department of the Navy 1944:8).

Kosrae was a popular stopover during the heyday of the whaling period in the Pacific. Its forest and streams provided the food and supplies badly needed during the whalers' extended voyages. The island has been known by many names, including **Arao**, Armstrong, Experiment, Hope, Quollen, Strong, Teyoa, Ualan, Walang, Kuthiu and Kusae.

Belau

A complex cluster of volcanic islands, fragmented coral atolls and low islets of limestone, this archipelago is encircled by a combination of barrier and fringing reefs (refer to Figure 2.8). Ngerekebesang (Arakabesan), Babeldaob, Oreor (Koror) and Ngemelachel (Malakal) are volcanic while those farther south are all coralline or limestone (Department of the Navy 1944:11). All of the islands are heavily wooded and have long narrow hills with steep slopes to seaward. North of Babeldaob along the archipelago's eastern side, the reef is detached. At Babeldaob, it is more characteristic of a fringing reef. South of Babeldaob it again is detached until it reaches Beliliou where it hugs the east, south and west shores. A barrier reef flanks the entire west side of the chain and encloses an enormous lagoon. Access through the reef is provided by a series of natural cuts and channels.

Within the large western lagoon lie the main harbors for the island: Oreor (Koror), Kobasang, Ngemelachel (Malakal) and Ngeruktable (Urukthapel) Anchorage (Figure 2.20). Depth in the sandy- and silt-bottomed harbors does not exceed 130 feet and the ocean floor is relatively flat. During World War II, the Japanese made extensive use of both Ngemelachel and Ngeruktable harbors to shelter ships in support of their fleet train. As a result of U.S. bombing raids in March 1944, more than 60 ships were damaged or sunk in these areas.

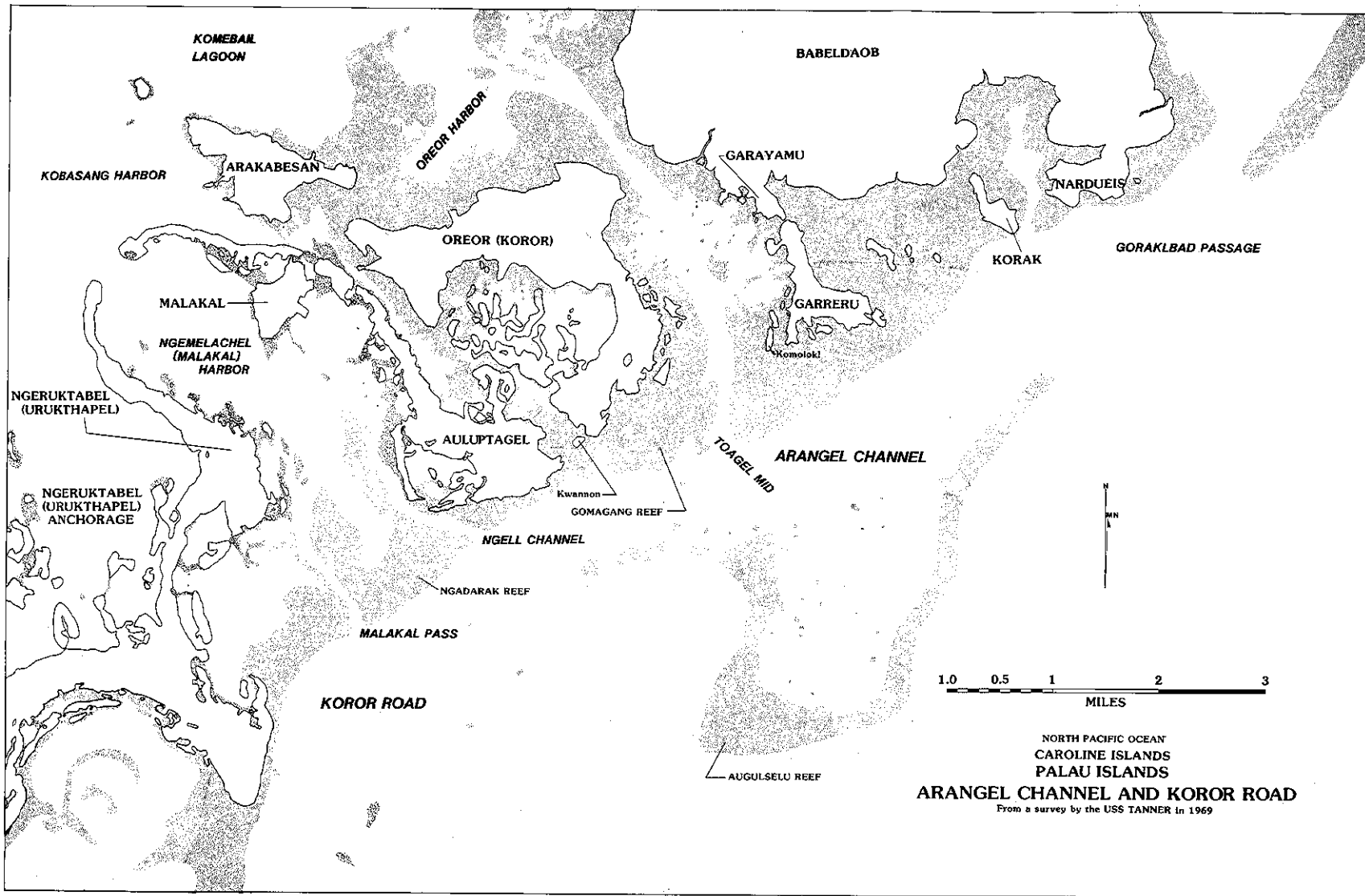


Fig. 2.20. Major harbors and bays on Belau.

CHAPTER 111.
PREHISTORIC MARITIME WATERCRAFT AND SETTLEMENT

by Richard Davis

In all the Micronesian groups of islands, the design of the outrigger canoe reached a higher level of development than in any part of Polynesia, as did also the knowledge of the science of navigation possessed by certain of the islanders. It is difficult to conceive of any possible great improvement upon the sailing canoe design of the Micronesians, for it combines three inventions of the utmost utility in sailing:

1. The flattened lee side of the hull, acting as a lee board to reduce drift to leeward and compensating to some extent for the pull to starboard of the outrigger float on the weather side.
2. The use of a lee platform on the cantilever system, enabling a greater quantity of cargo to be carried.
3. The midships pivoting of the mast, whereby the canoe was able to sail either end forward and so to keep the outrigger on the weather side, whichever course it was on (Haddon and Hornell 1936).

The canoes of the Micronesians have inspired the admiration of practically all knowledgeable sailors and social scientists who have studied them. The designs possess a high degree of both elegance and practical seaworthiness. Early European observers frequently remarked in glowing terms on the capabilities of the craft and of their sailors (Figure 3.1).

In all of the island areas of the Pacific, canoes were a vital and basic tool. The care, attention and prestige given to this technology justly reflect its strategic importance to continued existence of the societies. Especially in Micronesia (the name itself means "tiny islands" when

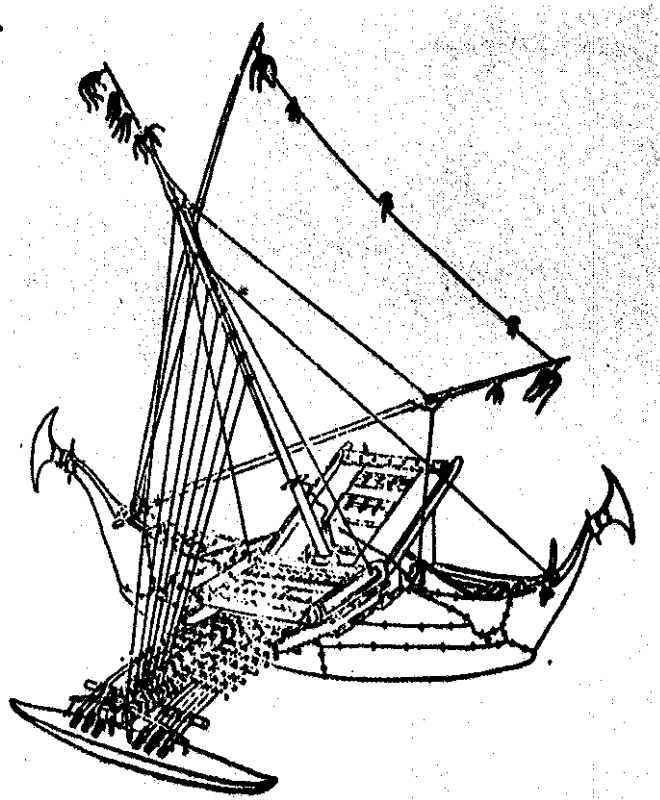


Fig. 3.1. Jaluit sailing canoe, showing all essential features of the design used in the Marshall Islands (after Alexander 1902; Haddon and Hornell 1975).

rendered in English), the dependence on canoes was great. In subsistence, communication, defense and even evacuation in the face of drought or storm devastation, the canoes served crucially important roles for the small island societies.

But outrigger canoes are not unique to Micronesia or even to the Pacific. The technology has its roots in a larger cultural tradition. In a general contemplation of these as potential submerged cultural resources in Micronesia, a brief look at the setting from a larger cultural perspective is helpful.

The native or indigenous languages of Micronesia all belong to one of the most widespread language families on Earth. This language family is now generally called Austronesian ("Of the Southern Islands" if rendered in English). Older references often used "Malayo-Polynesian" to designate the same language family. Languages included in this family are spoken in Madagascar, Formosa, the Philippines, Indonesia, parts of Melanesia, Micronesia and Polynesia. This distribution spans both the Indian Ocean and the Pacific.

This is not to say that all of the languages now classified as Austronesian are closely related or that the societies found speaking them all descend from a single ancestral society. It takes a technically trained linguist to demonstrate some of the connections. Similarly, the average speaker of English would not suspect that Croatian is a related language, though linguists have no difficulty finding that it is so.

The languages spoken in Micronesia in contrast to the Polynesian Islands, do not form a single, closely self-related subunit within the Austronesian language family. This diversity of language may indicate that this area has had a more complex internal cultural history than Polynesia, though as of this writing the cultural history is known only in very broad outline.

Initial settlements in the area today known as Micronesia apparently came in the second millennium B.C., though all dates this early have been disputed for both the Marshall Islands and the Mariana Islands. Traces of the earliest settlements on islands can be quite difficult to find and even more difficult to piece together, because islands can be surprisingly changeable geological entities, and settlements in coastal zones can be affected repeatedly by storms and geological shifts.

The initial settlers also apparently came from other islands in Melanesia and/or insular southeast Asia, though again, no consensus exists as to which islands furnished the sources

for any particular initial settlement or ancestral population for any specific island groups of Micronesia.

Having had a few thousand years in which to grow, change and interact with each other, the later cultures and societies found and described by European explorers, traders and missionaries can be expected to be substantially different from those of the first settlers in those islands. And they are. In several of the larger islands, Europeans found highly organized political systems, under centralized authorities, and relatively dense populations. Yet, what archeological traces remain of the earliest settlements seem to indicate much smaller scales of village sizes and numbers and less-intensive utilization of the resources available.

Certainly, the major island groups did not exist in anything approaching strict cultural isolation in the later prehistoric times. Voyages between islands and island groups were undertaken often enough that routes between island groups were established parts of the navigator's training. At least some of the people in each island group knew in more than general terms what sorts of developments were taking place in other neighboring island groups and probably had indirect knowledge of goings on in even more distant places. Although we know that communications were maintained, we do not know with any certainty the average rates at which contacts were maintained.

It is not known to what extent coordinated communications among islands is also true of the earlier prehistoric societies in Micronesia. It is one of the questions that archeologists will be tackling through close examination of materials for years to come. The question is of no little importance, because many researchers like to use the different island societies as "independent test cases" for theories of culture. Strict "independence", for these purposes requires the assumption that such communications did take place were infrequent and inconsequential enough to have little or no effect on the subsequent developments of a particular culture or society. It is an assumption that may not be true at all.

We can hope that the picture of Micronesian prehistory will begin emerging with much more distinctness in the next few years. More archeological research is now underway in Guam alone than took place in three previous decades in all of Micronesia. This situation is largely due to legal obligations placed on both government-funded capital improvement projects and on large private-development projects. New information on a wide range of questions of prehistory is already emerging. The rapid development is providing funds for the research but is also erasing traces

of the past with alarming speed. Any summary written at this time would be overtaken by new information before it got into print.

But even in all of this rush of new information for prehistory as a whole, new information on canoes from the archeological record cannot be expected in any abundance. Sadly (from an archeologist's point of reference), the materials of prehistoric canoes are not likely to be preserved in the archeological record of either land or sea. The wood and fibers would decay rapidly in most terrestrial sites (assuming a canoe found its way into such deposits). And because the materials were buoyant, very few lost craft are likely to have sunk to the safety of deep waters for preservation before having been thoroughly broken up at the surface. Areas with mud and silt at the margins of the sea and land are the places where abandoned or lost canoes could survive, but these places are rather rare in Micronesia. Still, any find of an intact canoe or portions of a canoe in an archeological context would be extraordinarily significant.

Because the archeological context can be expected to provide so little direct evidence on the development of canoes in Micronesia, we must rely heavily on indirect methods that develop historical sequences back from what is known through the best historical documentation of the later times. The works of Haddon and Hornell (1975) will always provide the foundation for any such attempt. Their compilation of as much documentation on canoes of Oceania as they could from primary sources and from historical sources stands unsurpassed to this day, though of course there have been valuable supplemental studies.

The documentation provided by Haddon and Hornell is voluminous, but so is the subject. Canoes and navigational skills were of central importance to a wide variety of societies in different local circumstances. Attention and prestige were lavished on canoes and the persons in charge of them. And the variations of form and detail of canoes matched the variations that can be seen today in automobiles, which may, in fact, occupy a similarly strategic position for our own culture.

There were war canoes, canoes for cargo, canoes for use in shallow and calm waters, and the sailing canoe for distant trips on the open ocean. Each canoe had design features fitting it for its intended purposes. Each island society used its own resources to best advantage in construction, and each society found a way to impress its own desires for expression on the canoe designs, too. Any attempt at

complete consideration of canoe designs in Micronesia alone would run to hundreds of pages.

In 1981, Dr. Edwin Doran, Jr. published a study on the general seaworthiness of several related canoe designs from the entire area of the Austronesian-speaking people (Doran 1981). Doran is a geographer and presented an interpretation of the distribution of various canoe types in a geographical method that was once a major technique among anthropological studies as well.

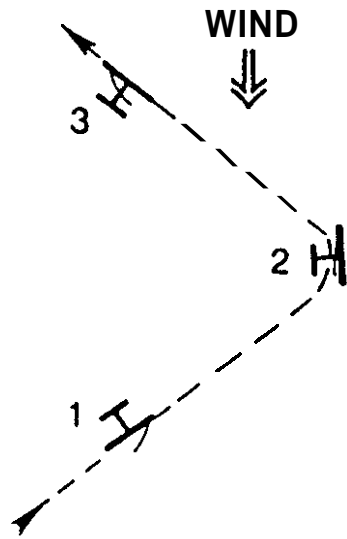
Dr. Doran finds that the age-area method gives a fairly stable picture of relative ages and origins for several of the attributes of sailing canoes among Austronesian-speaking peoples. Briefly stated, the age-area method is based on the assumption that cultural traits spread outward from their centers of origin and that later developments will tend to have spread to a smaller extent than have older ones.

As an illustration of the method, fads that originate in California spread to other places. By the time one such fad has made its way to St. Louis from Los Angeles, an even newer fad will have originated and made its way to Denver but not yet to St. Louis. Mapping the areas in which the fads are practiced gives indirect, but persuasive, indications of both the general places of origin and the relative ages of the fads.

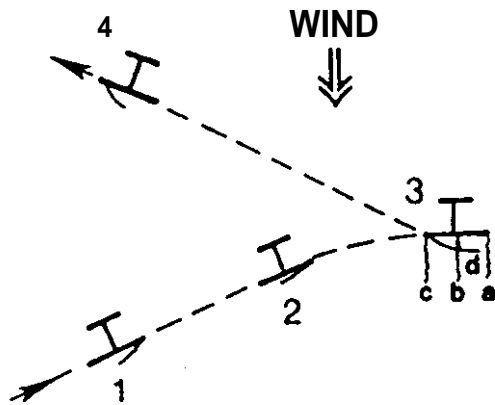
Dr. Doran examined the attributes of hull form, sail type, and the "shunting versus tacking" technique for sailing against the wind, which is the third attribute cited by Haddon and Hornell in the opening quote (Figure 3.2). His conclusions can be briefly summarized as follows.

1. Hull forms were developed in the following sequence:
 - a. double canoes,
 - b. single outriggers using tacking techniques,
 - c. single outriggers using shunting techniques and
 - d. double outriggers.

Several other attributes such as the symmetry of the two hull ends were found to relate to the shunting technique as well (Figure 3.3). Dr. Doran feels that all forms except perhaps the shunting single outriggers were originally from somewhere in Indonesia, particularly with double outriggers replacing single outriggers late in the sequence (Figure 3.4).



A. TACKING



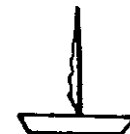
B. SHUNTING



3a



3b



3c



3d,4

Boat and sail profile viewed from lee side.

Fig. 3.2. Techniques of A, tacking, and B, shunting (After Doran 1987).

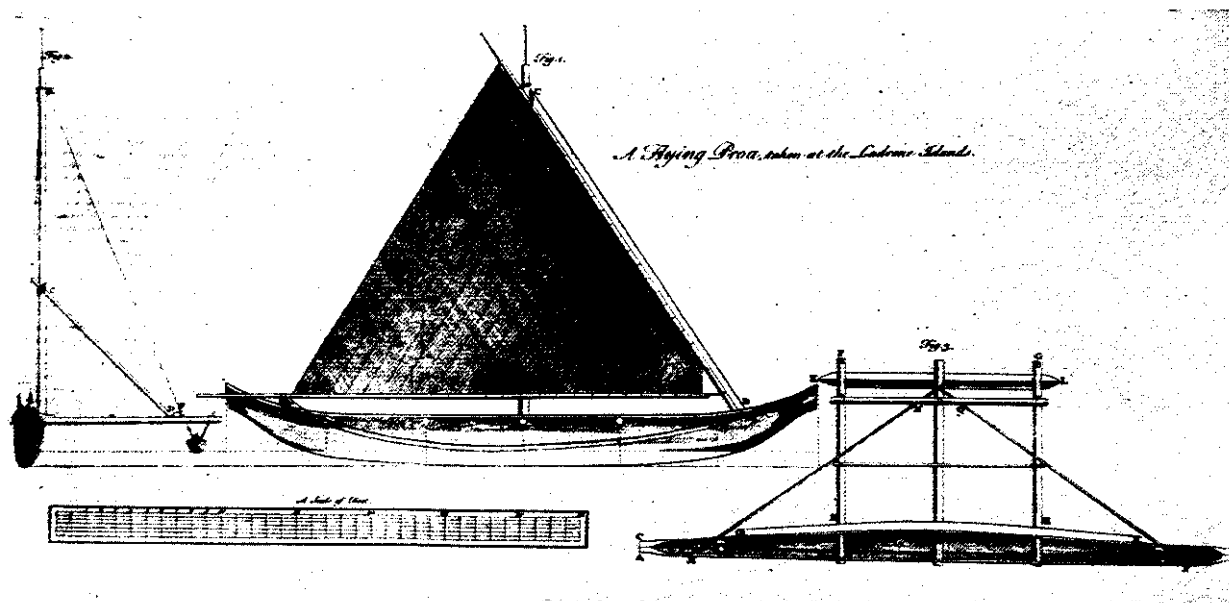


Fig. 3.3. Flying proa of the Mariana Islands (Anson 1748).
(Courtesy of the Huntington Library)

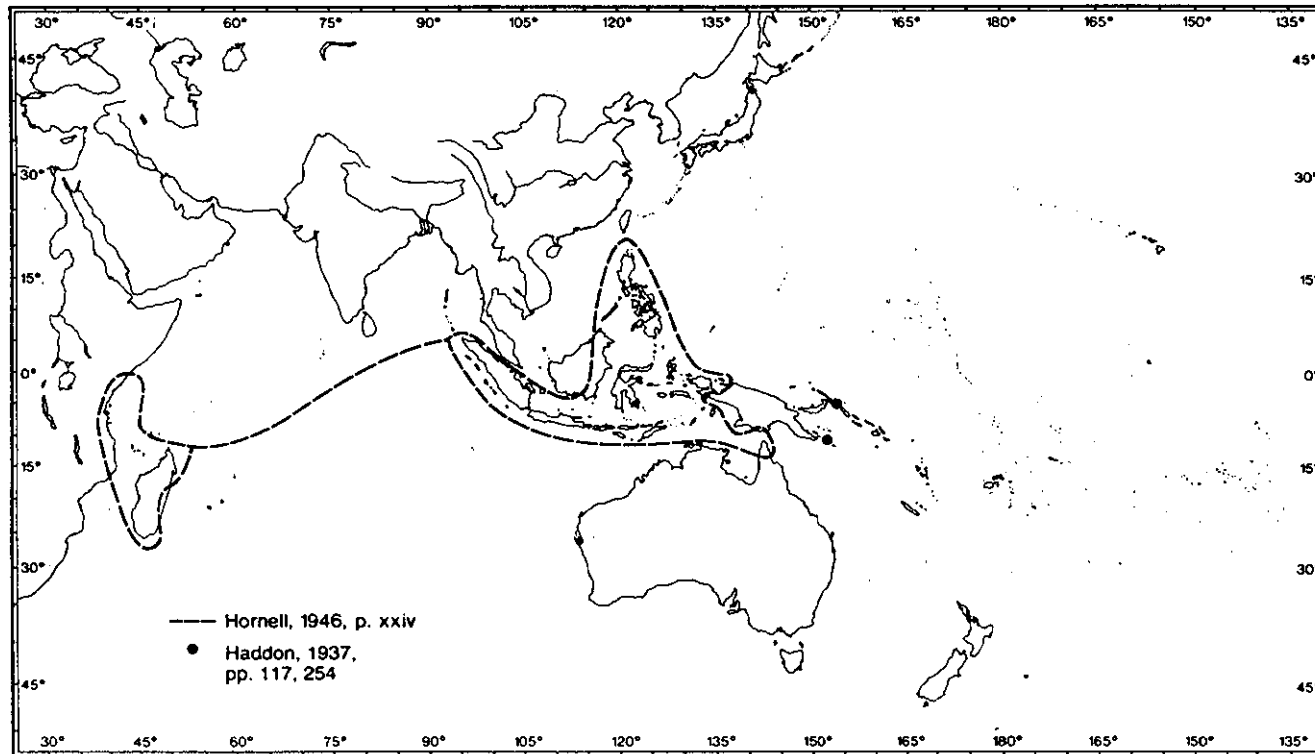


Fig. 3.4 Distribution of double-outrigger canoes (Doran 1981)

2. Sail types were functionally related to the hull types, and are found distributed where the corresponding hull types are, *so* these do not give by themselves any additional historic insights.

3. The Micronesian area was the center of development if not of the original innovation for the shunting technique and the specific design features associated with it. The other major innovations originated in Indonesia and spread from there.

The age-area technique does not by itself give indications as to the earliest origins of Micronesian settlements. It is more important for calling attention to the degree of communications that were maintained over long periods of time. After all, the basic data being compared are the canoe types in these areas at the times historical documentation becomes available. And these data suggest that Micronesia had received imported canoe forms at least twice since its initial settlement and was "exporting" another major improvement in the basic sailing technology at the time of discovery by Europeans.

It is indirect evidence, to be sure, but it also leads to a tentative hypothesis that the canoe technology of the initial settlements was not the same as that documented by the later European explorers. Not the elegant "flying proas," but double canoes or perhaps single outriggers using tacking are likely to have been the craft of the first settlers (Figures 3.5 and 3.6). The seaworthiness of these was sufficient enough that a continuous chain of contacts was maintained with at least the "nearest neighbors," and later techniques for canoe design were acquired by diffusion through those neighbors. Single outriggers using the tacking method may have been the original craft but could have come later, and even the shunting single outrigger may have come from an area closer to Indonesia where double outriggers have since replaced it.

Whether or not the shunting technique originated in Micronesia, the Micronesian refinements of the shunting single outrigger design are not matched elsewhere.

The distributional data used in the age-area method are indirect evidence but perhaps the best that will be available, unless by some fortunate event we find one or more ancient canoes well preserved in datable archeological contexts from the early occupations. We may hope for this event, because it will shed light on what still stands as one of the more thrilling achievements of the human species on this planet, the discovery and settlement of the tiny islets of the Pacific, nearly lost in the expanse of open ocean.

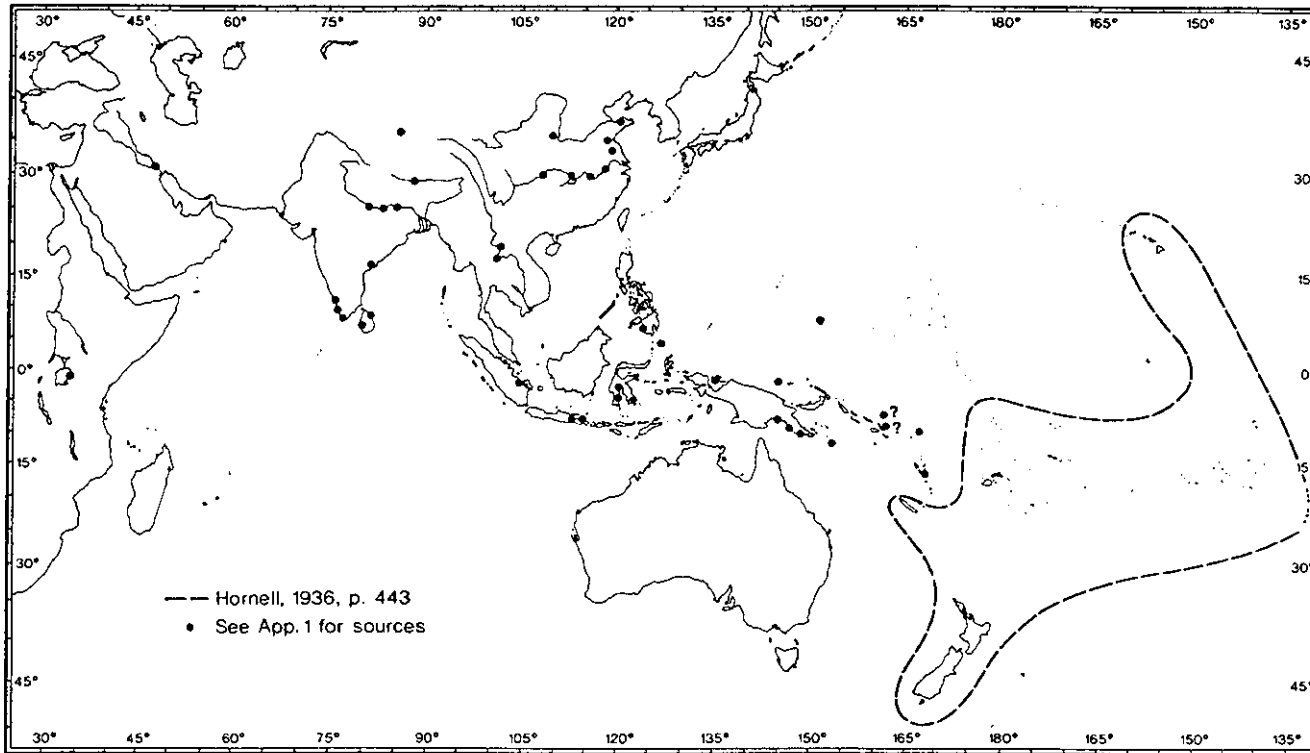


Fig. 3.5. Distribution of double canoes (Doran 1981).

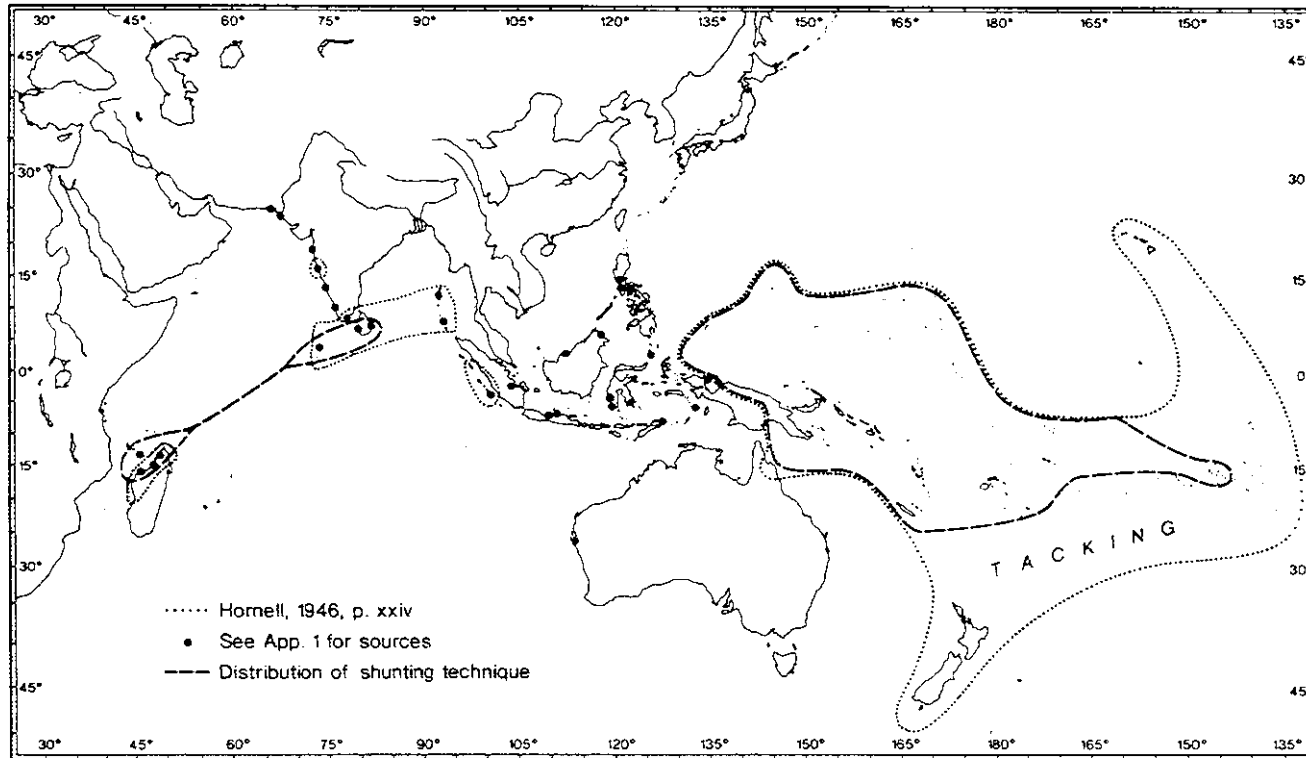


Fig. 3.6. Distribution of techniques (Doran 1981).

canoes and of tacking

CHAPTER IV.
EUROPEAN DISCOVERY, CONTACT AND COLONIZATION

By Toni L. Carrell and Marjorie G. Driver

Introduction

The sixteenth century Spanish discoverers of Micronesia ventured into the region not to satisfy an inner urge for adventure, nor to pit themselves against the elements, but to fulfill two basic motives: to "... discover islands and lands and rich spiceries and other things ... to the benefit of the Kingdom" of the Spanish and holy Roman monarch Charles V (Cushner **1971:12**) and "... to serve God ... to give light to those who were in darkness, and grow rich, as all men desire to do" (Bernal Diaz del Castillo trans. **1908** in Parry **1963:19**). Magellan discovered the Islas de Ladrones (Mariana Islands) while seeking a westward route to the spice-rich Indies. Those Spaniards who quickly followed, explored Micronesia while aspiring to claim a share of the lucrative spice trade by discovering and asserting ownership of unknown islands growing the rare spices. The quest for pepper from India, cinnamon from Ceylon (Sri Lanka), nutmeg and mace from the Celebes (Sulawesi) and the Indies, ginger from China, and cloves from the island of Halmahera, referred to as the Moluccas or Spice Islands, sent the Portuguese and the Spanish on voyages into Micronesia that taxed the men, ships, and treasuries of both countries.

The arrival of Ferdinand Magellan at the southernmost of the Mariana Islands on March 6, **1521**, heralded the end of isolation from European influence and marked the beginning of an era of change and outside dominance in Micronesia that would span more than four centuries before coming full circle back to self-government.

The European maritime world of the late fifteenth and early sixteenth century was poised on the brink of an explosive growth in knowledge of the seas. Passage from ocean to ocean, links to known countries of established commercial importance, were most practically made by ship. For a Europe that was demanding trade with the East, it was taken for granted that:

a reliable ship, competently manned, adequately stored, and equipped with means of finding the way, [could] in time reach any country in the world [that] has a sea coast, and can return whence it came (Parry 1974:xi),

European sailing vessels exploring and exploiting Micronesia reflected the changing requirements of discovery, conquest, commercialization and colonization. Change was also reflected in the indigenous craft of the Micronesians. Archipelagos are by nature maritime communities. The forms of interisland communication they developed reflected a conglomerate of circumstances based on the need for mobility, availability of resources, the forces of nature and circumstances imposed by outside forces. The eventual disappearance of many of the indigenous craft of Micronesia was a direct result of the impacts of European discovery and colonization.

The effects of European discovery rippled throughout Micronesia. Like waves moving away from a storm center, they arrived at the islands at quite different times and appeared in differing forms within the region. Continuous European contact, under the influence and control of the Spanish, began in 1565 in the Mariana Islands. However, the Caroline, Marshall and Gilbert islands were nearly forgotten after some initial discoveries and were not irrevocably swept into the Dutch, and English spheres of influence until 1696, almost a century after the Spanish had settled in the Mariana Islands. The obvious cultural and commercial differences between the Spanish, the Dutch and the English, lead to distinctly different precolonial experiences between these island groups. These dramatic differences are reflected in the discussions that follow.

Discovery and Exploration

During the late fifteenth century, the Portuguese steadily worked their way down the west coast of Africa and established a chain of bases along the way. The Bull of Pope Alexander VI in 1493 and the Treaty of Tordesillas in 1494 gave the Portuguese exclusive rights to colonize and explore all areas east of an imaginary line of demarcation established well out into the Atlantic. As a result of Vasco de Gama's voyage in 1497 around the Cape of Good Hope to India, the Portuguese established a monopoly over the only known sea route to the Orient.

By 1518 the shipping route down the African coast and across the Indian Ocean to India and the strategic Malaccan Straits was the exclusive estate of John III of Portugal. The Portuguese had succeeded in creating a highly profitable commercial empire in the East, while the Spanish could do little but stand by and watch with covetous eyes (Hezel 1983:8).

As a consequence, the Spanish were forced to look for a westward route to the Indies.

Columbus' voyages to the West Indies, under the auspices of the Spanish Crown, were part of this westward thrust. Exploration of the Caribbean basin by Columbus (1492-1498); the Gulf of Mexico by Pineda, Grijalva and Cordoba (1515-1520); and the east coast of South America by Hojeda, de la Cosa, Vespucci, Pinzón, Mendoza and Solis (1499-1515), among others, were supported by Spain in an effort to find an alternate route to the East (Keith 1987:14-26). It was not until 1518, when Magellan was able to convince the Spanish Crown that rounding the tip of South America would bring him to the Spice Islands, that significant progress toward another route to the Indies was made. When TRINIDAD and its companion ships sailed into a small harbor on the southern coast of Guam in 1521, Magellan's hopes of a westward route became a reality. Although only 18 men and one small ship, VICTORIA, eventually survived the rigorous expedition to the Indies and returned to Seville, Spain had achieved success. Its long-sought avenue to the Spice Islands was established and exploration of Micronesia had begun (Figure 4.1).

On May 6, 1522, during the return voyage, the crew on TRINIDAD, commanded by Gonzalo Gomez de Espinosa after Magellan's death, glimpsed tiny Sonsorol (refer to Figure 4.1). This was the first recorded sighting of an island in the Caroline Islands by Europeans (Stanley 1874:25-29). However, it was the Portuguese, not the Spanish, who made the first forays into the Carolines.¹ Stirred into action by the Spanish discovery of a western route to the Spice Islands, the captain of the Moluccas was ordered to initiate exploration of the surrounding waters and lay claim to them, particularly those to the north--the unfamiliar Philippines.

¹The following overview of the European discovery and exploration of the Caroline and Marshall Islands draws heavily from the work of Fr. Francis X. Hezel, The First Taint of Civilization (1983), except where otherwise noted.

The islands were reported to contain spices, gold, silver and other precious metals all just waiting to be claimed, preferably by the Portuguese, not their bitter rivals the Spanish.

In 1525, Dioga da Rocha was dispatched from the Moluccas to explore and lay claim to the lands to the north (refer to Figure 4.1). Caught in a severe storm in October of that year and driven between 800 and 1,200 miles to the northeast, the embattled crew finally sighted a small island group. Rocha named the islands Islas de Sequeira, after the ship's pilot. The captain and his crew remained on one of the islands, probably Ulithi in the western Carolines, for four months making repairs and waiting for favorable winds. During their stay, the Portuguese learned that there were no metals on these islands, although gold could be obtained from high mountains to the west, possibly in the southern Philippines. On January 20, 1526, Rocha sailed out of Ulithi and the island was forgotten.

A second expedition to the Pacific also began during the summer of 1525. A fleet of seven vessels commanded by Juan Garcia Jofre de Loaysa set out with the sole purpose of taking possession of the Spice Islands for Spain, by whatever means possible. Nearly a year after departing Seville, the fleet finally arrived in the Pacific--with only two ships remaining. When the fleet was forced to put in at Mexico for repairs, only one ship, SANTA MARIA DE LA VICTORIA, was capable of continuing the journey. Shortly after VICTORIA's departure, Loaysa died. Within a week the second in command, Sebastian del Cano, was also dead. Alonso de Salazar assumed command, continuing northward in a desperate search for provisions and water. When the crew finally spotted a small island, they named it San Bartolomé in honor of the saint's feast day. San Bartolomé was most probably the island of Taongi, now called Bokaak, the first European discovery in the Marshall Islands (refer to Figure 4.1). Unfortunately, VICTORIA's crew was unable to find a suitable anchorage and were forced to sail on, eventually arriving at Guam.

After a brief layover in Guam for reprovisioning, Salazar, his less-than-full-force crew and several native Guamanian islanders who were impressed into service, departed for the Philippines. Also among the crew was the sole survivor of three men who deserted Magellan's TRINIDAD four years earlier, Gonzalo de Vigo (Noone 1986:103). Following a brief stay in the Philippines, Salazar continued to the Moluccas where he was met by a substantial Portuguese force that was able to quickly rout the Spanish by compelling them to abandon their ship and take refuge in the hills.

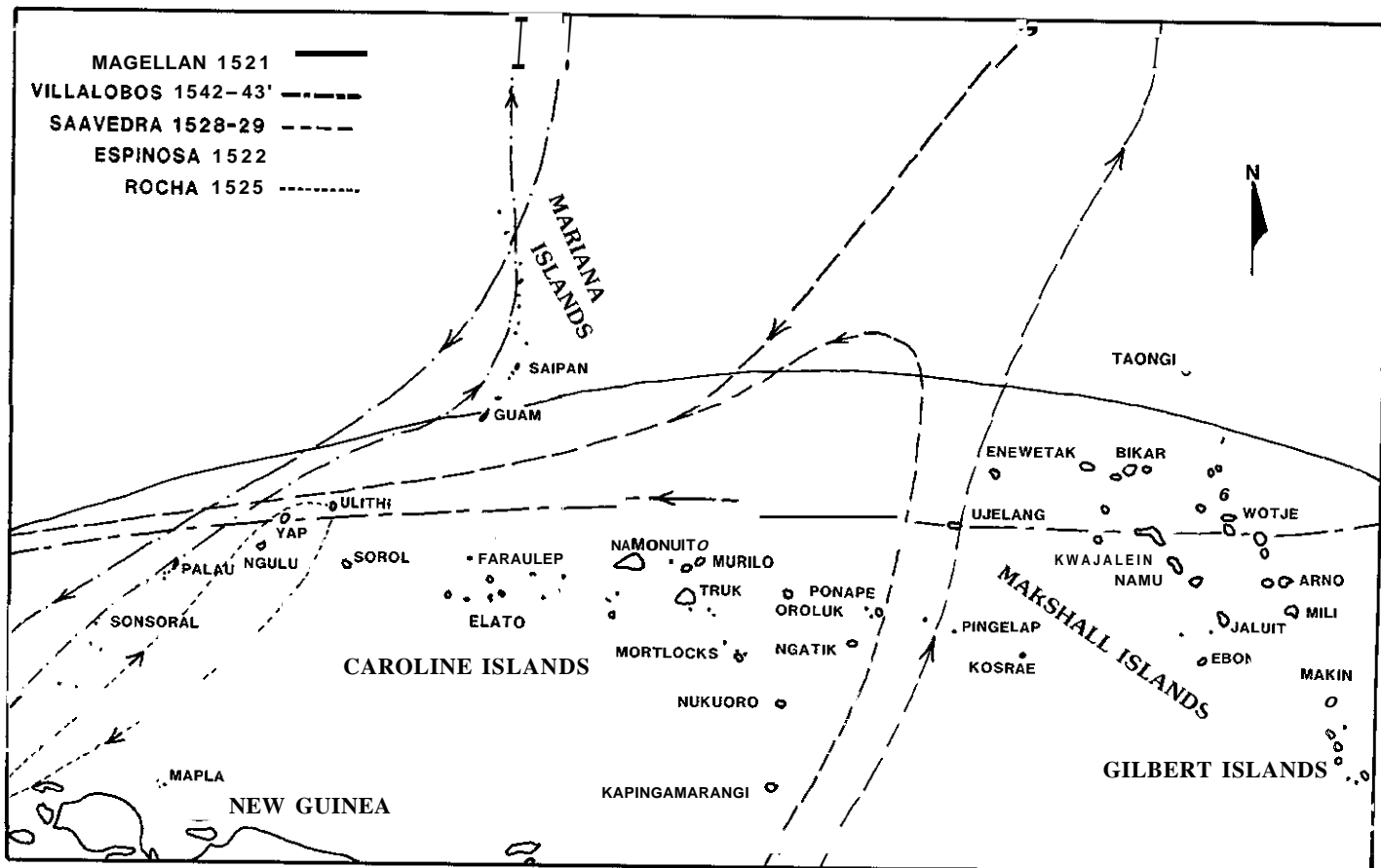


Fig. 4.1. Sixteenth-century voyages of exploration and discovery, 1521-1543.

In October 1527, Charles V sent another fleet from New Spain (Mexico) under the command of Alvaro de Saavedra Ceron to provide assistance to the Loaysa-Salazar expeditionary force. In December, during Saavedra's crossing of the Pacific, he sighted the Ladrones but did not put into port (Coello 1885:42). On January 1, 1528, two small islands in the western Carolines were discovered; the Spaniards named the group Islas de los Reyes. The two islands were most likely Fais and Yap.

Upon reaching the Philippines a few weeks later, Saavedra finally heard news of the Loaysa-Salazar survivors. Although Saavedra realized he could not hope to rescue Salazar and his crew, he continued to the Moluccas where he picked up a cargo of valuable spices before departing the Indies. Hoping to find a return route back across the Pacific to New Spain, Saavedra ran along the northern coast of New Guinea and eventually turned northeast. En route he reached an island he called Barbudos because of the beards worn by the natives. The island was recorded as being at 7° north latitude and was probably Pohnpei (Ponape) or one of its outliers. After six months of frustration, and with the winds still against him, Saavedra was finally forced to turn back to the Moluccas.

In May 1529, Saavedra again attempted to cross the Pacific (refer to Figure 4.1). He retraced the route of his voyage the year before in FLORIDA, again sighting islands in the vicinity of Barbudos. Continuing northeasterly into the area of the Marshall Islands, in late September Saavedra reached what is probably today the atoll of Ujelang. Impressed by the tattooed natives, he named the islands Los Pintados. On October 1, another group of islands was discovered to the northeast. This group, distinguished by its lush vegetation, was named Los Jardines. It is suspected that Los Jardines are the atolls of Bikini and Enewetak. After a brief stay and some limited reprovisioning, Saavedra and his crew in FLORIDA continued northeastward. Within a short time, however, Saavedra and his successor were both dead, although the ship had reached the northern latitudes and the winds that would have eventually taken them back to New Spain had they persevered. Returning to Tidore, in the Moluccas, FLORIDA's crew joined the Loaysa survivors in the hills.

While Saavedra was battling the winds in his effort to cross the Pacific, the representatives of the Spanish and Portuguese Crowns were working on a treaty. Although explorers under the auspices of the Spanish Crown had succeeded in discovering a westward route to the Indies, no ship had been able to recross the Pacific and return to New Spain. Of 15 ships sent out by Spain, only Magellan's VICTORIA had returned; the loss of life among the crews

paralleled the ship losses. Needless to say, the commercial success of the voyages was less than spectacular. The Treaty of Zaragoza, signed in 1529, stipulated that in exchange for 350,000 ducats, Spain would give up its tenuous rights to the Spice Islands to Portugal (Cushman 1971:29). Under the circumstances, it was probably reasonable recompense for the Spanish.

It was not until November 1542, 13 years after the Treaty of Zaragoza, that the Spanish once again attempted an expedition into the Pacific. Ruy Lopez de Villalobos, captain of a fleet of six vessels, set out from Mexico with orders to seek out the Islas del Poniente (Isles of the West), the Philippines (refer to Figure 4.1). Although access to the Moluccas was denied, there was nothing to stop Spain from exploring, conquering and colonizing the Philippines, reputedly rich in cinnamon and gold. On December 25, 1542, the fleet made a landfall somewhere in the Marshall Islands and Villalobos named the islands Los Corales. Shortly thereafter, they arrived at another atoll suspected of being Saavedra's Los Jardines. The Ladrones were also sighted but no stop was made (Colin 1900(I):149). In the Carolines, Villalobos rediscovered Fais and Yap. There the explorers were greeted in Spanish that must have been learned from the members of the Loaysa-Salazar expedition 14 years earlier. Accompanying Villalobos was the chronicler Antonio de Herrera. Herrera eventually published one of the earliest and best maps of the northern Pacific, which depicted all the islands discovered by the Spanish (Historia General, Madrid, 1601).

Villalobos reached the Islas del Poniente in early February 1543 and immediately set out to conquer the local inhabitants on the island of Mindanao. Ultimately, the expedition proved unsuccessful, and after finding out that the Philippines had been claimed by Portugal five years earlier, Villalobos abandoned Mindanao and set out for the Moluccas. Severe food shortages and loss of life forced him to surrender to the Portuguese, who eventually provided the survivors passage back to Spain.

In 1552, the caravel SANTA MARGARITA, commanded by Pedro de Acuña, on a trading and exploring venture, is believed to have wrecked somewhere in the Ladrones (Potter 1972:414). It may be that other vessels visited the islands during this period; if so, they are not generally known.

It was not until 1564 that the Spanish again attempted colonization of the Philippines. Despite evidence that the Philippines lay beyond the Spanish zone, as set forth in the Treaty of Tordesillas, Phillip II decided that an outpost in the Philippines would be established. Miguel de Legazpi was

dispatched from Mexico with orders to make for the Philippines to discover which of the islands grew spices, obtain samples of those and the other riches available there and establish a colony. A few days out of port, one of the ships in the fleet, SAN LUCAS, deserted the flotilla. Capt. Alonso de Arellano and the crew of SAN LUCAS intended to become pirates, preying on rich merchant vessels in the Indies.

Piloted by Lope Martin and purposefully avoiding Legazpi, SAN LUCAS slipped away and ran a few degrees south of the usual track to the Ladrones. Within a month it had made its first landfall at a group of low islets that compose Likiep Atoll in the Marshall Islands. The following day, January 7, 1565, two more islands--Dos Vecinos--were discovered (Figure 4.2). Dos Vecinos, two neighbors, were probably Kwajalein. On January 8, another island approximately 20 miles south of Kwajalein was discovered. This was, perhaps, Lib Island, also called Nadadores by Arellano as a result of the hostile welcome received by the Spanish. On January 17, several high islands ringed by a barrier reef were seen--the Truk Islands. Once again, the well-armed natives, hostile and bent on capturing the ship, pursued SAN LUCAS in their canoes. On January 18, another small group of islets was discovered, the atoll of Pulap. Unlike the Trukese, the people of Pulap offered to provide water and wood to the crew. Although apprehensive, several men went ashore with the islanders. Unfortunately, their fears were well grounded, and before it was all over two sailors were killed and a third barely escaped. Arellano named the islands Los Martires, the martyrs. A few days later the natives of Sorol Atoll, in the western Carolines, repeated the hostile greeting offered by the Lib, Truk and Pulap islanders. This time the Spanish were prepared. They fired on the armed natives and seized their canoes and weapons for wood. Once beyond Sorol, the remainder of SAN LUCAS' voyage to the Philippines was uneventful.

About the same time SAN LUCAS reached its first landfall, Legazpi in SAN PEDRO reached another island in the Marshalls. He disembarked, claimed it for the King of Spain and named it Isla de los Barbudos on January 11, 1565 (CDI 1887:76-79). Subsequently, Legazpi discovered four more uninhabited island groups during the voyage through the Marshall Islands (refer to Figure 4.2).

The flotilla finally reached Guam on January 22, 1565. Forty-four years after Magellan's initial visit to the Ladrones, Miguel López de Legazpi arrived with three ships to officially claim the islands for the Spanish Crown. Symbolic of the claim, and in accord with the customs of the times, Mass was said in a large boathouse (Doc. Ined. 1967, Doc. 27,

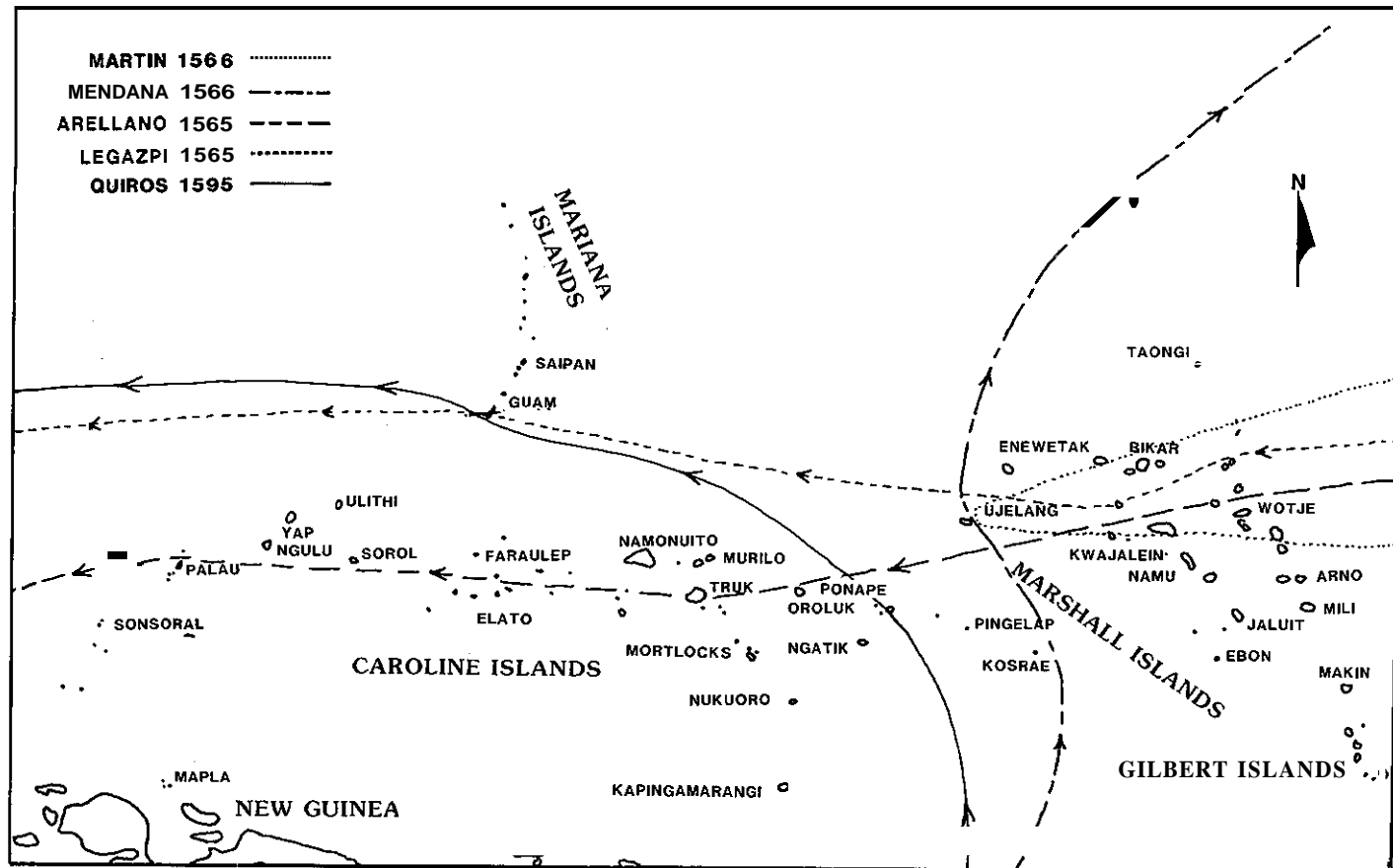


Fig. 4.2. Sixteenth-century voyages of exploration and discovery, 1566-1595.

1565:251) near the shore of a bay on the southwest coast of Guam (Noone 1986:n.543). Legazpi used his sword to cut branches from the trees, pulled grass, threw stones and had crosses carved in coconut palms near the shore (Doc. Ined., Doc. 38, 1565:80). Following the ceremony, the flotilla set about reprovisioning. The Chamurres--the natives of Guam--living up to their 50-year-old reputation for simply taking items that interested them, swarmed over the ships collecting whatever they could. Tensions mounted between the Spanish and the natives following a report that a group of sailors had been stoned while ashore seeking water. The death of a young seaman brought matters to a head. As a result, an armed party from the flotilla torched a village and all of the canoes readily available. The reprisals ended with Legazpi hanging four Chamurres and departing.

Arriving in the Philippines in mid-February 1565, Legazpi spent the next two months exploring Samar in the eastern Philippines before arriving off the coast of Cebu in late April. Although he was greeted by a large, well-armed force of natives, they were quickly dispersed by the ship's artillery. Legazpi took possession of the islands in the name of the Spanish king, Philip II and formally initiated an era of colonial rule that would span more than 300 years (Cushner 1971:53-54).

In the interim, however, Arellano arrived in the Philippines before Legazpi and decided to wait for the fleet in the Davao Gulf. After a brief but unsuccessful search for the rest of the fleet in that area, Arellano departed the Philippines on April 21, 1565. Still piloted by Lope Martin, SAN LUCAS tracked northeast, then east in the hope of finding a sailing route back to Mexico. When SAN LUCAS reached 40 degrees north, the westerly winds quickly carried the ship across the Pacific to North America. Two months later Legazpi also left the Philippines and sailed northeast along a course similar to that taken by SAN LUCAS. The successful second west-east crossing of the Pacific by Legazpi, in SAN PEDRO, established once and for all the return route that would be followed by the Manila galleons for more than 250 years.

Upon the arrival of SAN LUCAS in Acapulco, Spanish authorities had the ship SAN JERONIMO quickly outfitted to bring additional supplies and reinforcements to Legazpi, still believed to be in the Philippines. Lope Martin was again selected to pilot the ship back across the Pacific. Not long after departing Mexico, Martin convinced SAN JERONIMO's crew to mutiny and eventually took control personally. Continuing in a westerly course through the Marshall Islands, SAN JERONIMO sighted several small islands and arrived at Ujelang on July 6, 1565 (refer to Figure 4.2). During their brief stay on the island, some of the

mutineers slipped back to the ship, retook it and ultimately left Martin and 26 others marooned.

The successful establishment of an outpost in the Philippines by Legazpi opened the doors of the Orient to Spain. With the beginning of Spanish rule, trade between the Chinese and the Spanish community at Manila grew rapidly. Chinese entrepreneurs brought silks, teas, porcelain, spices and gems to the Spanish traders who, in turn, purchased these goods with silver mined in Peru and Mexico. The first of the Manila "galleons" to traverse the Pacific were SAN JUAN in 1567, under the command of Juan de la Isla, and two unidentified ships, under the command of Felipe de Salcedo. SAN JUAN sailed from the Philippines in July and arrived at Acapulco in November, while Salcedo departed Acapulco in April, stopped in Guam to reprovision, and arrived in Manila in August. On a return voyage, SAN PABLO, also under the command of Salcedo, was lost in the Ladrones after departing Manila on July 1, 1568. SAN PABLO has the distinction of being the first Manila galleon lost in the trans-Pacific crossing. One hundred thirty-two survivors eventually made it back from the Ladrones to the Philippines in a small bark they constructed from a ship's boat (Dalgren 1917:48).

The rich Manila galleons quickly brought English privateers into the region. Quite naturally they concentrated their activities in the Mariana Islands, close to the galleon route. However, Drake did stop at an island well off the Manila track in the western Carolines in 1579 and, after being visited by sticky-fingered natives, referred to it as the "Island of Theeves" (Hezel 1983:32; Lessa 1975:253). The island Drake is suspected of visiting is present-day Belau (Palau).

The last exploratory encounter into Micronesia in the sixteenth century occurred when Alvaro de Mendaña led two expeditions (1568, 1595) to search for the phantom land of Ophir, the source of Solomon's gold (refer to Figure 4.2). On his disastrous second voyage, Mendaña died and his command was assumed by Pedro Ferdinand de Quiros. On December 23, 1595, while attempting to reach the Philippines after the small band had been decimated by raids on their camp, Quiros nearly ran aground on an offshore reef that was most probably at Pohnpei in the eastern Caroline Islands. Quiros is also credited in 1606 with being the first European to sight the island of Butaritari in the Gilbert Islands, which he named Buen Viaje. However, it was Quiros' near disaster at Ponape that marked the end of the first wave of exploration into the region.

Because the island chains that make up the Gilbert, Marshall and Caroline archipelagos of Micronesia had no riches or

precious metals, and the Manila-Acapulco route ran well north and touched only the Marianas, there was little reason for further Spanish exploration of those islands. The discoveries were recorded in various journals and logs, and the general locations of the islands were noted; however, they were quickly forgotten and allowed to fade into obscurity by the Spanish. As a result of their geographic location, the fate of the islanders in the Gilberts, Marshalls and Carolines would be dramatically different from that of the Mariana Islanders who would feel the full impact of Spanish domination. This led to significant differences in the subsequent history of the Mariana Islands and a cultural break with other people in the region. In the Mariana Islands, these differences began in the mid-1560s.

Contact, Conquest and Colonization²

Mariana Islands

Following initial discovery, European influence in the Mariana Islands may be divided broadly into three time periods: contact (1565-1668, Legazpi to Sanvitores), conquest (1668-1700, Sanvitores to Madrazo) and colonization (1700-1898). The Spanish colonial period, in terms of the evolution of maritime activities, may be divided into three general categories: early colonial period (1700-1765), mid-colonial period (1765-1825) and late colonial period (1825-1898).

When Miguel López de Legazpi's flagship, SAN PEDRO--captained by his 17-year-old grandson, Felipe de Salcedo, with Father Andrés de Urdaneta as navigator--discovered the return route from the Philippines across the Pacific to Mexico, the Chamurre people, unknowingly, entered a new age; an age during which their customs and lifestyle changed and disappeared and that heralded the end of their magnificent ocean-going flying proas.

Contact 1565-1668--Flying Proas, Acapulco Galleons and Privateers

The Age of Contact may be considered to be the 103 years between the arrival of Legazpi's expedition at Umatac and the

'This section, Contact, Conquest and Colonization in the Mariana Islands 1565-1898 was written by Marjorie G. Driver.

establishment of the Jesuit mission in the Marianas by Father Diego Luis de Sanvitores.

From the archipelagos of Micronesia have evolved some of the world's most unusual sailing crafts and some of its most skilled mariners. Western navigators venturing into the Pacific Ocean in the 1500s came upon a chain of islands inhabited by people known to them initially as Chamurres. The Europeans marveled at the speed and versatility of the Chamurre sailing vessels, which they described as "flying proas" (Navarrete 1971(17):644), speedy outrigger canoes whose bow became the stern and vice versa by a simple maneuver of the sail (refer to Figure 3.3). So numerous were the small craft that when Ferdinand Magellan first saw them in 1521, he named the islands *Islas de las Velas Latinas*, the Islands of the Lateen Sails. When he stopped to provision at one of the islands, a misunderstanding over property rights caused him to refer to it and its inhabitants as the island of the thieves (*Isla de los Ladrones*). For centuries this pluralized epithet remained on charts and maps to identify the entire island chain to the western world (Driver 1983:198).

Whenever the strange, large, European vessels came in sight of the islands, usually between Rota and Guam, the two southernmost in the chain, swarms of native craft sped out to meet them. Abuses and misunderstandings between the foreign sailors and the Chamurres soon made the islanders wary in their dealings with the visitors; nevertheless, they eagerly traded water and provisions for bits and pieces of highly valued iron (*hierro*).

With the discovery of the return route across the Pacific from the Philippines, the so-called "galleon trade" was initiated--a continual movement of men and goods between Spain's colonies in the New World and in the Far East. For 250 years great merchant vessels regularly plied the Pacific and served as an indispensable link between Manila and Acapulco, thereby connecting Spain's colony in the Far East to her viceroyalty in New Spain and, by extension, to the mother country itself (Figure 4.3). In addition to the layover at Acapulco, the only other anticipated stop on the year-long voyage was made on the trek to Manila when the galleons usually paused for water and provisions at the southernmost of the *Ladrones*. This north-south chain of islands straddled the galleons' designated track, and as soon as the vigilant natives sighted their sails--for they soon must have become aware of the seasonal regularity of the ships' arrival--they put far out to sea in canoes to meet them, eager to trade water and produce for highly prized pieces of iron (Driver 1983:199).

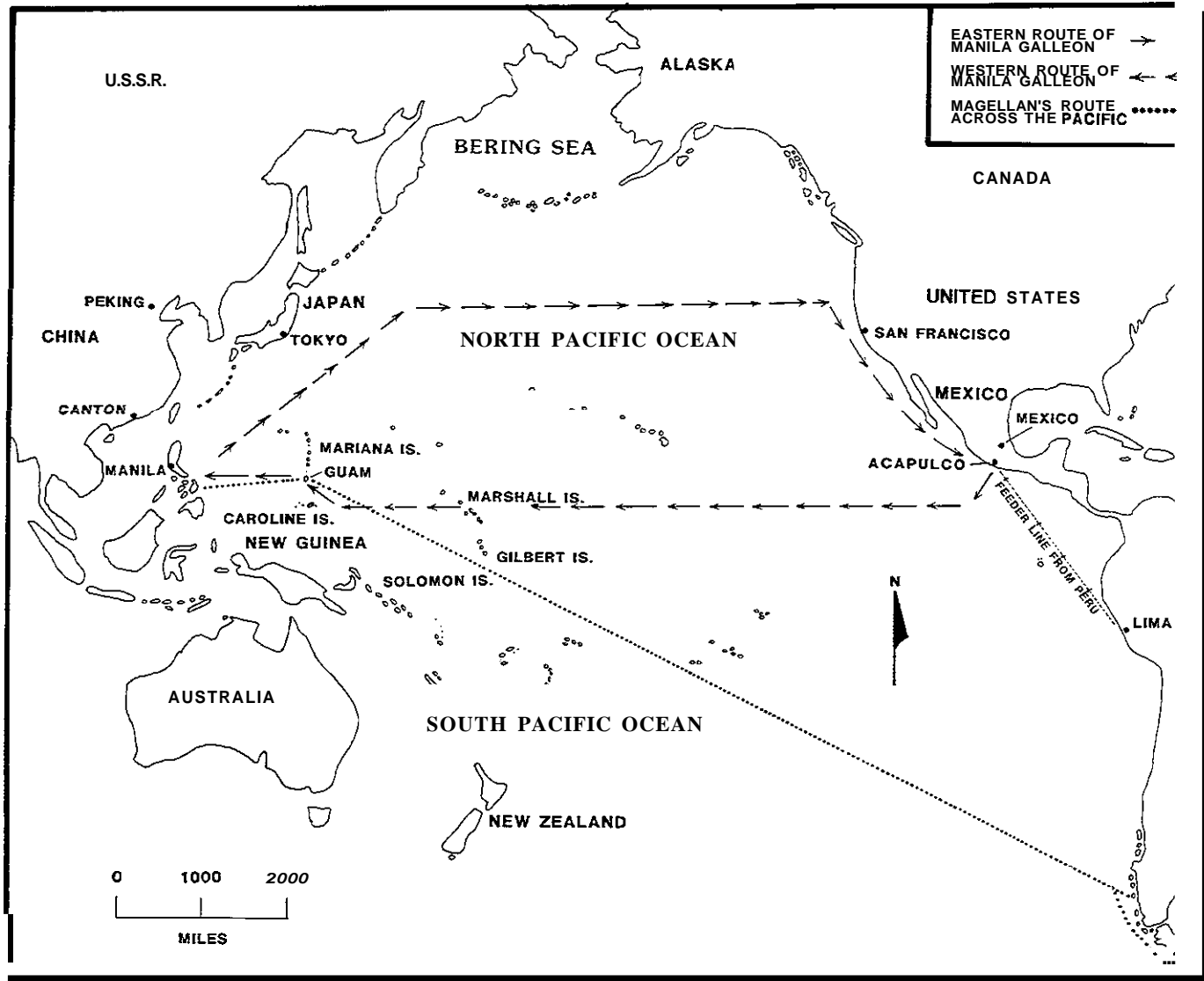


Fig. 4.3. Galleon route across the Pacific

The islands of the Chamurres became important to the galleons for two reasons. First, they served as navigational points from which the final leg of the journey, the run to the San Bernardino Straits, could be charted. The straits were the easternmost entrance to the Philippine archipelago through which the ships passed and threaded their way among the islands to the west coast of Luzon and Manila's port of Cavite. Second, after the ships had sailed 60 or 70 days out of Mexico, the islanders could be depended upon to provide water and provisions, a circumstance that freed valuable cargo space at Acapulco to load additional goods and personnel.

After the Guam visit of Miguel López de Legazpi in early 1565, and the discovery of the return route to Mexico several months later, the natives became accustomed to the yearly arrival of the galleons as the ships passed through their islands on the leg from Acapulco to the Philippines. More than 100 ships passed through the islands during the period 1565-1668, most in convoys of two or more vessels, which carried several hundred people and, although the great majority were Spanish ships sailing on the regular run from Acapulco to Cavite, some were English and Dutch privateers out to capture and plunder the silver-laden galleons. Among the privateers were Thomas Cavendish, who was in the islands briefly in 1588 (BR 1903(10):261) and Oliver Van Noort in 1600 (Burney 1967(II):190).

Shortly after the newly-appointed Governor General of the Philippines] Gómez Pérez Dasmariñas, passed through the Ladrones on the way to his new assignment, he wrote to the king to suggest that a presidio, or garrison, be established in those islands (Colin 1900(I):178n). A few years later, in 1566, his successor, Francisco Tello de Guzmán, requested permission to leave missionaries there with soldiers for protection (BR 1903(9):226). The king did not see fit to recommend either action and it was not until many years later, in 1668, that the establishment of a small Jesuit mission with a few soldiers for protection was authorized on Guam.

In early January 1566, the galleon SAN GERONIMO, under the command of Alvaro de Mendaña's widow, Isabel Barreto, and piloted by Pedro Fernández de Quiros, passed between Guam and Zarpana, or Rota (Coello 1885:54). The crew were unable to anchor because they had no cable for lowering and hauling up their boat. Mendaña had sailed from Peru with an expedition that intended to establish a settlement at Santa Cruz in the South Pacific. Extreme hardship and many deaths among the settlers forced the decision to abandon the settlement and sail for Manila by way of the Ladrones.

During the next 100 years, three shipwrecks took place in the Marianas that presaged the handling of similar mishaps in years to come. The ships were all sailing eastward from Cavite to Acapulco when they were overtaken by devastating typhoons.

In 1568, three years after Legazpi claimed the Ladrones for Spain, one of his ships, SAN PABLO--also captained by his grandson Felipe Salcedo--was making the return trip from Cebu to New Spain and carrying a large shipment of cinnamon, as well as pieces of gold, porcelains and other trade articles (BR 1903(29):34). Salcedo had orders from the governor, his grandfather, to stop at Guam to determine whether or not there were cloves or pepper in the islands. SAN PABLO, with 132 people aboard, reached Guam and took port on August 15. Salcedo and most of those aboard were ashore searching for spices when a typhoon struck and drove the ship ashore. Although the ship broke up before any cargo could be salvaged, the captain managed to save the packet of letters addressed to the king. The people who had remained aboard were saved thanks to the assistance of those who had gone ashore and commandeered a number of proas to effect a rescue.

The survivors remained on Guam three months. During that time, they built a bark by using timbers and planks from the wrecked ship and mounting them on the hull of their skiff. In spite of troublesome encounters with the islanders, Felipe Salcedo's wisdom and good humor prevailed; the boat was soon finished and all the people returned safely to Cebu (San Agustin 1975:298).

SANTA MARGARITA and its consort sailed from Cavite in July 1600, both heading for disaster. Heavily laden with Oriental goods, MARGARITA struggled and floundered for eight months through a series of typhoons in the northwestern Pacific until, with the ship dismasted and badly damaged, the crew managed to sail to the southern Marianas toward the known track of the incoming Acapulco galleons. Sailing past Tinian, they reached the northwest coast of Rota, or Zarpana as the island was then known to the Spanish. Although 260 of more than 300 persons aboard had perished, including the general of the fleet, somehow the crew brought the ship in close to shore and attached moorings. On the sixth day, however, the rotted lines parted and the ship ran up on the reef (Juan Pobre ms. 1598-1603, ch. 69, fol. 281). Most of the few surviving Spaniards were picked up later by passing Manila-bound galleons, but several black service personnel and women refused to leave the islands.

In 1638, NUESTRA SENORA DE LA CONCEPCION, reportedly the largest vessel of the time and the richest that had ever been seen on the route, sailed from Cavite on August 10, captained

by the Governor's young nephew, Juan Francisco de Corcuera. Dismasted and damaged in a typhoon, it was driven onto the shores of Saipan's Point Aguingan, where it sank. Six survivors made their way to Guam and were taken in a native boat--surely an ocean-going canoe, or flying proa--to the Philippines; others were picked up later by passing ships; still others remained in the islands for the rest of their lives.

During this period, a substantial number of people from the ships are known to have remained for fairly lengthy stays among the Chamorros, the name by which the islanders eventually became known. Most were the survivors of shipwrecks, though the first was the Spaniard Gonzalo de Vigo, originally with Magellan's expedition and the sole survivor of three who deserted from Espinosa's TRINIDAD. He lived in the islands four years, from 1522 to 1526, and was picked up between Rota and Guam by SANTA MARIA DE LA VICTORIA of the Loayisa expedition.

When the galleons passed in 1596, one of the Franciscan missionaries aboard SAN PABLO, Fray Antonio de los Angeles, decided, possibly on impulse, to jump ship in order to bring Christianity to the islanders. The two soldiers who jumped after him in an attempt to persuade him to return to the ship were also carried off by the Chamorros. The three remained in the islands and survived unharmed until they were picked up by the passing galleon the following year (Driver 1977:19).

Another shipwrecked survivor was a Chinese named Choco. He had been aboard one of the King's champans, sailing from Manila to Terrenate, when it was blown off course and wrecked at Saipan (Figure 4.4). At the time of Father Sanvitores' arrival at Guam in 1668, Choco and a few survivors from the 1638 wreck of CONCEPCION were living in the islands.

Conquest 1668-1700: Chamorro (Islands), Acapulco: Galleons and Cavite Supply

By the time Father Diego Luis de Sanvitores established the Jesuit mission in the renamed Mariana Islands in 1668, at least 135 ships had touched at the Ladrones. These had been mostly Spanish ships travelling between Acapulco and Manila, but some were English and Dutch vessels preying on the returning silver-laden galleons.

During the period 1668-1700, the efforts directed toward the Christianization of the people resulted in the conquest of the islands and the subjugation of the people to the Crown of Spain. Traditionally, the Chamorros had kept maritime contacts with the inhabitants of neighboring archipelagos by

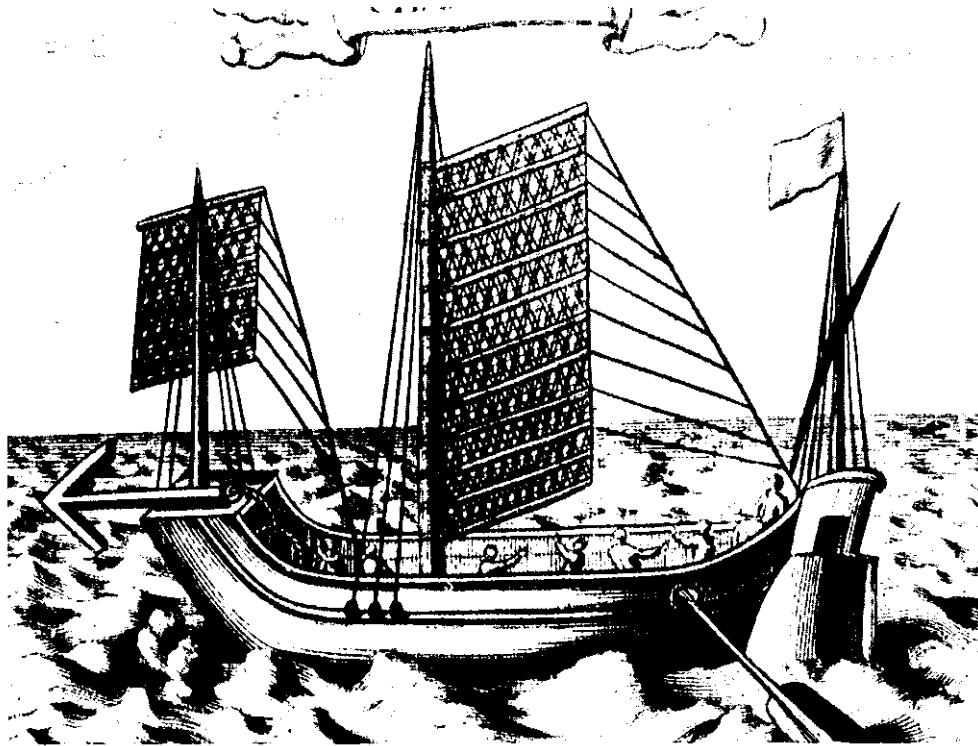


Fig. 4.4. This type of ship, a champan, was used by the Chinese Choco, shipwrecked at Tinian around 1648. (Courtesy of Micronesian Area Research Center Collection)

means of their flying proas, ocean-going canoes. These contacts, like other lifestyle patterns, were weakened or eventually destroyed by the Spanish "reducción," the Christianization effort that demanded resettlement into church-centered villages.

Between 1668 and 1700, at least 45 ships (including several English) touched at the Marianas (Figure 4.5). Most left men, supplies and silver for the garrison's payroll, but some carried diseases instrumental in the rapid decimation of the islands' population.

By the beginning of the 1700s, the colonial development in the Marianas and on Guam required more direct contact with Manila than could be provided by the yearly Acapulco ships. Soon supply ships from Cavite, propelled by the short-lived southwest monsoon, put in at Umatac (Figures 4.6 and 4.7). During this period, several boats constructed in the Marianas made their way to the Philippines. Of these, one was constructed from the wreckage of the Cavite supply ship wrecked by a typhoon at Umatac in 1683 (AGI F11:65). Another was a small frigate constructed from the wreckage of NUESTRA SENORA DEL PILAR DE ZARAGOZA, wrecked on a reef at Cocos Island in 1690 (AGI F562 v.2).

During these years of conquest and early colonization, several factors interacted to bring about the near extermination of the ocean-going canoes, the so-called flying proas, in the Marianas. In order to continue the work of Christianization and colonization, Governor José Madrazo (1696-1700 administration) occupied himself with the removal of the Chamorros from the eight inhabited islands north of Saipan, known collectively as Gani, an exodus accomplished with the use of Chamorro seagoing canoes. This left only the islands of Saipan, Rota and Guam inhabited (Murillo Velarde 1749(4):373; Corte 1875:32). The forced resettlement of the population was accomplished before 1700 and, in order to prevent the islanders from escaping and returning to the northern islands, the Spaniards destroyed many of their canoes. The population itself decreased significantly as Chamorros died resisting the conquest and from a series of epidemics. The forced removal resulted in the death of more than 3,000 islanders, many of whom perished at sea; others died because of the effects of having to move to unfamiliar surroundings and a warmer climate (AGI U561 v.2:216). With the decrease in population and the forced changes in living patterns, there also came a decrease in traditional shipbuilding skills.



Fig. 4.6. Guam from a 1671 map by Father Alonzo Lopez.
(Courtesy of Micronesian Area Research Center Collection)

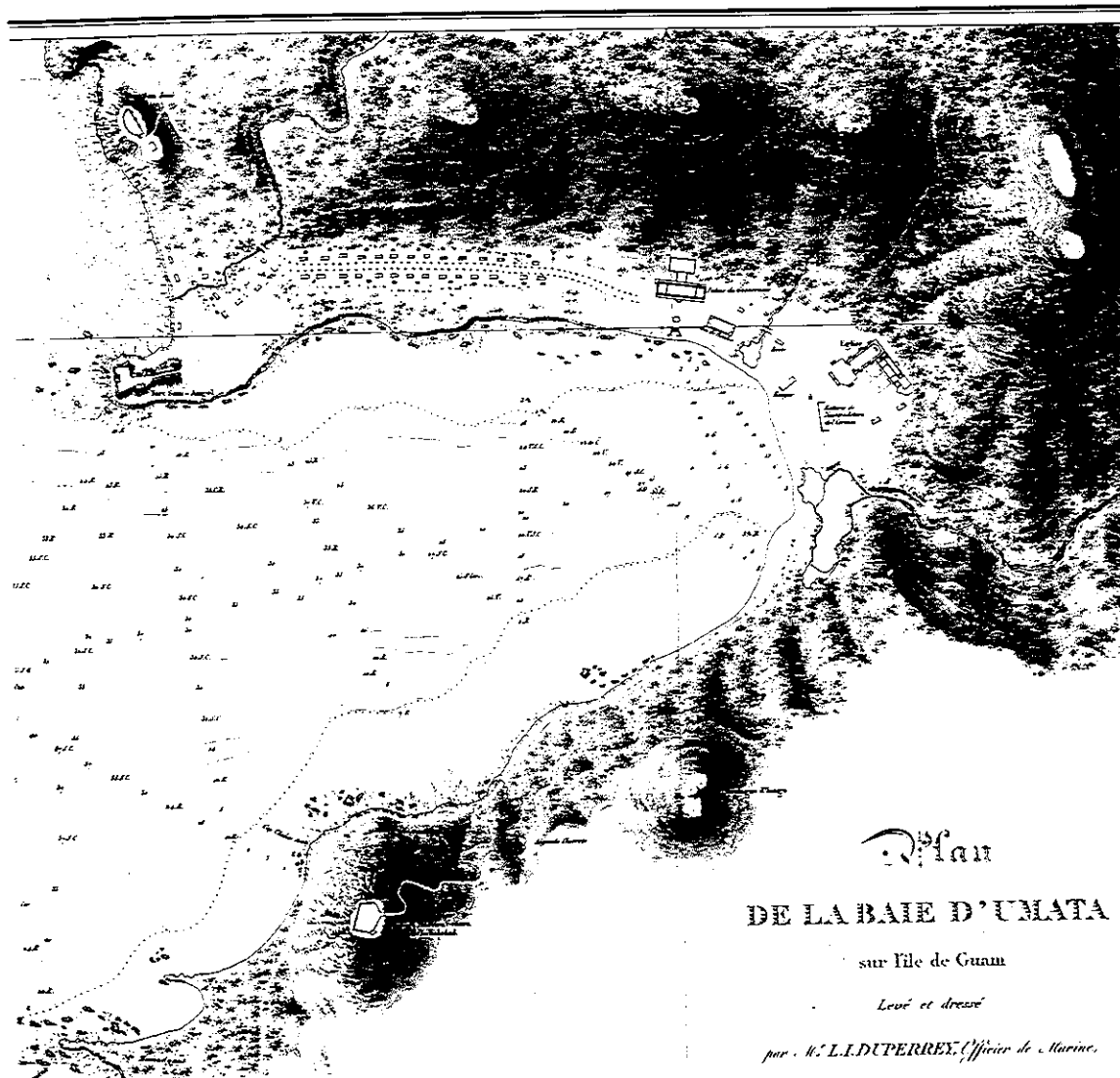


Fig. 4.1. Umatac Harbor, Guam map 1819, by Duperrey.
(Courtesy of Micronesian Area Research Center Collection)

Early Colonial Period 1700-1765: Acapulco Galleons,
Cavite Supply Ships and Priguet Boats

The most significant drop in the population of the Marianas is the sharp drop in population. By 1700, Governor General of the Marianas Juan Bautista Fimiente (1709), reported to the king that the population had fallen to less than 500 for the three inhabited islands of Guam, Rota and Tinian down from the many thousands reported in the early years of the century (AGI F129 and 4). No longer did large numbers of flying proas approach the Acapulco ships.

The early Spanish navigators when speaking of the flying proas of the Chamorros, use the Spanish term proa, a swift Malayan vessel having a lateen sail and an outrigger. Apparently this was because some of the men of the expedition, the first European to see the vessels of the Chamorros, were familiar with the term from previous experiences in the South China Sea, the East Indies and Indonesia. Early Spanish documents concerning the Marianas use such terms as "navichuelos," "embarcaciones," "canoas," "barcas," "barquitas," "barqui" and "barca" of which only the term "barca" appeared early on into the 17th century. Because the term is used in the Philippines it may have been introduced by Filipino seamen on the Manila galleons and later reinforced by their countrymen sent to serve at the garrisons in the Marianas. It is possible that it is a Chinese word from the Spanish era. However, its origin, the term used in the early colonial period is "banca" when referring to Chamorro flying proas. The term "proa" does not appear in Spanish documents as early as "banca" or its variant "barca".

Whether or not the Chamorro "flying proas" lived in the vicinity of the Marianas remains to be determined, but during the 17th century the latter term was used in respect to the small, manned flying proas that it is difficult to know, therefore, whether the flying proas actually were or were not used by the English as a matter of fact by the English especially in the Marianas, who called their vessels by other names and terms.

3 Regardless of its applicability to Chamorro canoes, during the 1800s the term "banca" appears in documents of that century to denote the ocean-going canoes of the Carolinians.

After Father Diego Luís de Sanvitores established the Jesuit mission headquarters at Agaña in 1668, he and his companions were forced to visit the inhabited northern islands in the small frail vessels (embarcaciones) of the natives. Early on, he had requested the Governor General of the Philippines to provide a small vessel for travel between the several islands, but none materialized during his lifetime, and the missionaries continued to depend upon native vessels. Although the islanders were extremely adept at sailing them, the colonizers found them small, unstable and dangerous for their purposes,

During Governor Juan Antonio Pimentel's long administration on Guam, which began in 1709, there was much maritime activity in the Marianas. During the early 1700s, attempts were made to reach the "Islands to the South," the Caroline Islands, from both the Philippines and Guam. This proved a difficult undertaking, and in 1709 a patache was lost and at least one bilander (balandra) was lost in 1710 (Fernández Duro 1972(6):489). Several supply ships, returning to Cavite, also attempted to stop at the Palaus, but attempts to establish a mission in the southern islands were frustrated until much later.

On March 22, 1710, a few months after Governor Pimentel's arrival in the islands, four ships appeared off Guam's coast. One, BATCHELER, was the renamed NUESTRA SENORA DE LA ENCARNACION Y DESENGANO, the Acapulco-bound galleon captured a few months earlier by the British privateer Woods-Rogers off Mexico's Cape San Lucas. The governor, recognizing the superior firing power of Rogers' squadron and his own military limitations, and hoping to avoid bloodshed and plunder, decided the best strategy was to welcome the intruders hospitably. His tactic was to provide provisions, seek the release of Spanish prisoners, and allow the pirates to sail away as soon as possible with the captured galleon's cargo intact (AGI F129:64).

Governor Pimentel assigned administrators (alcaldes) to tend to government affairs and to control the inhabitants in Rota and Saipan. The alcalde of Saipan forced the men to farm the "nica" root on Aguiguan and hunt cattle on Tinian. At Tinian, there were quarters for the workers who were sent from Saipan for three weeks at a time (AGI F528:40). The meat from Tinian, which supplied the Agaña garrison during the 1700s and 1800s, was often transported aboard bancas, a number of which were lost on the dangerous crossing between the islands. At Rota, Governor Pimentel's alcalde saw to it that hogs, dried meat, coconut oil, lard, fish, chickens and woven sails for the bancas were shipped to the governor's storehouse at Umatac to be sold to the officers aboard the galleons and the Cavite supply ships (AGI F528:39). There

were usually three or four Rota-Guam crossings each year, and the number of bancas in a fleet varied from one to four--although there were occasionally more.

In 1717 Governor Pimentel, in a very unusual move, sent several bancas from Guam to the northern islands of Gani to intercept the Manila-Acapulco galleon and to deliver some letters to the galleon's general. The bancas sailed July 5, 1717, and returned five months later, toward the end of November. Among those who went were two men from Anigua--an outlying barrio of Agaña--one of whom died on the return voyage from Tinian (AGI F528 (A-2):207). What prompted the governor's seemingly desperate attempt to contact the galleon on the high seas remains unknown, as no additional information has come to light.

The galleons continued to come and go, as did the less dependable supply ships from Cavite. During the early colonial years, several governors of the Mariana Islands devised ways to take advantage of the lucrative galleon trade. These included the sale to the officers of the galleons of hogs and produce, including hard-to-find and hard-to-harvest capers from Cocos Island and Facpi Point. They also sold sails for the ships that had been handwoven by the women of Guam and Rota. Additionally, the governors profited from the cultivation and sale of tobacco. This commodity became a veritable means of exchange because the islanders, forced to work unrelentingly in the fields, received in exchange for their long arduous labor nothing but a few leaves of poor-grade tobacco. The details of such business arrangements came to light in Governor Pimentel's judicial review (residencia) (AGI U561(5):1525; AGI F99:58; Driver 1988:21-43).

Meanwhile, ocean-going canoes (bancas) from the Carolines arrived at Guam in 1721 (AGI 1725 U561(3):718-721; AHN 1756 U5352(IV-2):470; Barratt 1988:8, 23); the possibility certainly exists that they also arrived on other unrecorded occasions. In 1725, a locally constructed vessel, like those mentioned above, was used to carry Governor Antonio Sánchez de Tagle (1720-1725) and his family from Guam to the Philippines, supposedly because the governor was seriously ill and needed immediate medical attention. In 1731, a ship carrying the missionaries, Fathers Cantova and Walter, reached Yap from Guam.

There was an increased dependence on the Cavite supply ships during this period because of foreign aggression against the galleons and the expense of shipping supplies and other materials from Acapulco. After the attack on the supply ship SAN ANDRES in Merizo Bay in 1721 by the British privateer John Clipperton, it became necessary to seek a safer

anchorage, and the feasibility of a change to Apra was investigated. As a result, the first supply ship anchored in Apra Harbor in 1734. After the harbor was sounded, Fort San Luis was built in 1737. From then on, Apra Harbor, rather than Merizo Bay, became the preferred wintering port, although ships continued to take on water at Umatac.

In 1739 war broke out between Spain and Great Britain, and ship contacts between 1743 and 1753 were sparse and intermittent. In the mid-1740s Spanish ships were hounded, first by the Dutch, then by the British, and there were years when no ships arrived to service the Marianas. In 1743 Lord George Anson spent several months at Tinian resting and refreshing his crew. From there he sailed CENTURION on to the Philippines, where he captured the Acapulco galleon COVADONGA. When Anson returned to England, he carried the booty from the captured galleon.

In 1746 the Governor of the Marianas, Domingo Gomez de la Sierra (1746-1749), brought materials from Cavite to build a boat for the presidio that would sail to Tinian to fetch meat. Governor Gómez, like many other governors, travelled to the Marianas on the supply ship from Cavite. Meanwhile, the British threat was taking its toll and the Governor General of the Philippines ordered the galleons not to stop at the Marianas, a decision later overruled in Madrid. The English threat was such that Guam's coastal defenses had to be strengthened, and in response, Governor Henrique de Olavide y Michelena (1749-1756, 1768-1771) built Fort San Fernando near the beach at Agaña in 1751. He also improved and fortified little Fort Santo Angel, atop a large boulder at the entrance to Umatac Bay, in 1755 (AGI F920).

By the mid-1700s, the islands of Guam and Rota alone remained inhabited, and the lifestyle of the Chamorro people had been transformed from a maritime to an agrarian orientation. Not only were the northern islands depopulated, which eliminated the need for transportation to service them and thereby curtailed the need for substantial numbers of ocean-going canoes, but the colony now depended almost completely on the Acapulco galleons and Cavite supply ships. When it became necessary to travel to Rota or Tinian for meat and produce, small, locally constructed vessels belonging to the presidio or garrison were used. For the most part, these were small sloops, manned by Chamorro crews and presidio skippers--sometimes referred to as the Governor's Boat. Bancas, manned by local mariners, also sailed between the islands at the request of the governors. These periodic trips to Tinian continued because it was the only source of meat available for the people on Guam.

The galleon trade suffered a number of setbacks between 1730 and 1775: two galleons were wrecked before entering the Embocadero, the entrance to the San Bernardino Straits and the Philippine archipelago; another, as noted, was captured off the east coast of the islands by George Anson; another was lost before it reached the Marianas from Acapulco; and NUESTRA SENORA DE LA CONCEPCION was wrecked by a typhoon in Guam's Apra Harbor. Some captains chose not to stop at the Marianas if they were in danger of arriving at the Embocadero late in the season, because a number of ship losses had been attributed to that factor. In addition, the supply ships from Cavite did not always arrive on schedule and several were lost.

Mid-Colonial Period 1765-1815--Frigates, Schooners and Carolinian Bancas

In 1765 Spain was authorized to sail directly from the Philippines to Spain via the Cape of Good Hope and the Indian Ocean, a route controlled by the Portuguese since before the time of Magellan. The use of the new route marked the end of the monopoly long enjoyed by the Pacific galleons. The days of the large cargo ships were numbered, as they were supplanted by smaller vessels, packet boats and frigates that could make more frequent runs. The new route, a shorter and less hazardous trip from the Philippines to Spain, coincided with the liberalization of Spanish trade laws. Although the need to support military and governmental establishments in the Philippines and in the Marianas with men and money from the Mexican Treasury continued, smaller vessels could be used because there was no longer the large volume of passengers and trade goods crossing between Cavite and Acapulco. Government-owned naos, or vessels, continued to operate and were supplemented by privately owned Spanish and foreign commercial ships, frigates and packet boats that often operated on government contracts.

In 1766, SAN PEDRO was lost at sea before it reached the Mariana from Acapulco--the first to be lost on that leg of the voyage in the trade's 200-year history. In 1769, the Jesuits were expelled from all Spanish territories, and their century-long presence in the Marianas came to an end as they were replaced by priests of the Order of Augustinian Recollects.

In late October 1775, His Majesty's frigate NUESTRA SENORA DE LA CONCEPCION, also called DESENGANO, was struck by a typhoon and wrecked on the beach at Sumay in Apra Harbor. There were 538 people and a large money shipment aboard. The silver was removed before the ship broke **up**, but the people were stranded at Guam for many months and, by early December, their food ran out. As had happened many times before, a

small vessel was constructed from the wreckage, the schooner NUESTRA SENORA DEL CARMEN, also called LA MARIANA, and sent to Manila with word of the shipwreck. Meanwhile, the large number of survivors faced a severe food shortage on the storm-devastated island.

During the last quarter of the eighteenth century, the Spanish frigates crossing from Acapulco to Cavite continued to call at Guam, more or less on schedule, while the supply ship from Cavite seems to have arrived less frequently. An increased volume of activity on the part of private North American commercial enterprises was noted, and the renowned clipper ships, which made the run from Boston to Canton in record time, passed through the northern islands of the Marianas' chain. Manila became a hub for trading activities, with Spanish and foreign-owned vessels chartered to service the Mariana Islands and other destinations. One American commercial trader that came to grief during this period was the brig BRAMIN. While it was anchored at Tinian in late 1797 or early 1798, a monsoon blew up, the cables parted, and the ship went to pieces on a reef (Ward 1967(7):271).

A Spanish scientific expedition, led by Alejandro Malaspina, visited Guam in February 1792. During the nearly two weeks the two ships remained at Umatac, several scientists conducted studies in natural history and cartography and made astronomic observations; from Umatac, the expedition sailed to the Philippines.

Several Carolinian trading canoes arrived at Guam's Talofofu Bay in 1788, but a disaster at sea shortly thereafter brought an end to other such ventures for many years. With renewed contacts after 1815, there was an increased dependence on the Carolinian bancas in the Marianas, especially for transportation between Guam and Rota (Figure 4.8). The Carolinian settlements that were made in the early 1800s in Guam, Rota, Tinian and Saipan depended upon these vessels for transportation, not just within these islands but between the Marianas and the islands of the Carolines as well.

In 1801 Governor Vicente Blanco (1802-1806) arrived at Guam aboard the American vessel LYDIA, especially chartered in Manila to make the trip. It was the first American commercial vessel known to arrive at Guam. As an aside, when it sailed for Manila, the remains of Doña Marla Agueda del Camino, wife of Governor Manuel Muro (1794-1802), were shipped aboard (Haswell 1917:203). Fort Santa Agueda at Apugan, overlooking Agaña, is named in her honor.

As American commercial vessels appeared in the western Pacific, an attempt was made to establish a provisioning station in the Northern Mariana Islands for fur traders

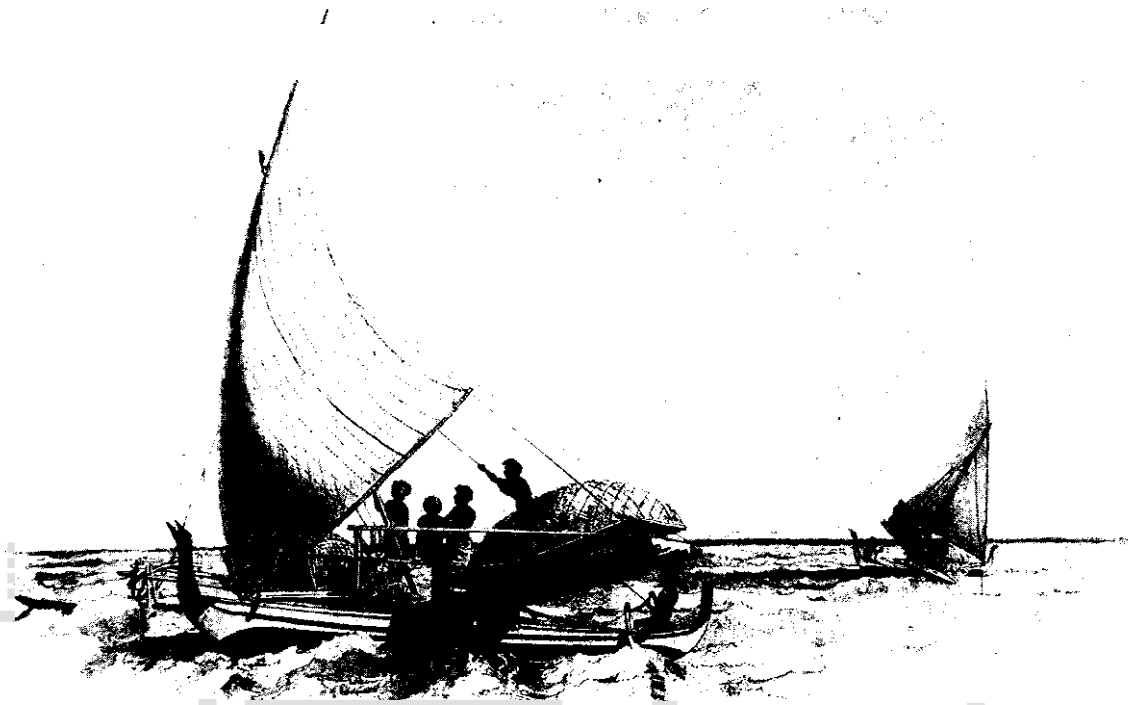


Fig. 4.8. Carolinian proas. The ubiquitous popo as depicted by Admiral Paris has not changed perceptibly for centuries. Still in use, it is lateen-sailed, twin-ended and single-outriggered. These Satawal canoes are exactly like those of Yap, Ulithi and the rest of the west-central Carolines. Source: Paris 1843:II, pl. 107. (Courtesy UCLA Library)

sailing between America and China. The small community, principally of Hawaiians, was later removed to Guam by Governor Parreño (1806-1812).

In 1808 the Spanish colonies in the Americas began their wars of independence. The first among them to declare its freedom was Mexico, in an event that heralded the end of the centuries-old galleon trade; the last vessel sailed from Cavite in 1817. In the Marianas, the effect of the interruption of regular shipping service to the Marianas forced a greater dependence on private vessels and the presidio's interisland boat.

In February 1814, the frigate SANTIAGO (also called INFANTE DON CARLOS), of the Royal Philippine Company, sailed into Apra Harbor from Lima's port of Callao. Its people were anxious for news of the uprisings in Mexico and had stopped at Guam specifically for that purpose. Unfortunately, it struck a reef on the Calalang Bank at the entrance to Apra Harbor and was wrecked. The people were saved, as was most of the silver--of the 500,000 pesos, all but 33,359 were recovered with the assistance of Carolinian divers who were on the island at the time (Barratt 1984:17). The so-called Spanish Rocks (Las Rocas de la Fragata Española) in Apra Harbor commemorate the disaster.

The last of the Acapulco ships to arrive at Apra was MAGALLANES in 1815. It seems ironic that it bore the name of the discoverer who had visited the islands nearly 300 years earlier and whose presence presaged the decline of the greatly admired Chamorro sea-going canoes.

Late Colonial Period 1815-1898--Frigates, Schooners, Whalers and Carolinian Bancas

In 1813 King Fernando VII signed a royal decree officially declaring the end of the 250-year-old galleon trade. One of the provisions freed the inhabitants of the Philippine Islands to engage in commercial activities in privately owned vessels (AGI F381). The Mariana Islands, as a province of the Philippines, soon noted an increase in the number of ships visiting its ports, notably whalers.

With MAGALLANES' last trip in 1815, the galleon trade in the Marianas came to an end. Unofficially, ships continued to cross from Manila to Mexico but they were destined for ports other than Acapulco, to places such as Tepic and Guaymas. The last of these great ships returned to the Philippines from Mexico in 1819. After that, the Manila-Mexico trade declined rapidly and the Mariana Islands lost direct contact with Mexico, forcing them to look, more than ever before, to the Philippines for support.

The void in shipping activities left by the demise of the galleons was picked up by smaller private vessels, although government ships continued to arrive intermittently. Most of the contacts with Manila were on privately owned frigates, brigs and schooners, many of which were contracted specifically for the run to the Marianas (Driver 1976:10). They were contracted to carry the mail and to transport supplies and men for the presidio--both the garrison and prison--as well as military officers, including governors, other government officials, their dependents, and occasionally, private citizens and their families.

As a result of the large number of ships and men arriving at Apra Harbor, a substantial number of Agaña residents moved to the port area and established the village of Sumay to carry on commercial activities more conveniently (Figure 4.9). English became a commonly heard language and it was reported that many islanders understood and spoke it well. Many local men shipped out as crew members. Others slipped out as stowaways and, although the government sought to curtail such activities, the situation was difficult to control. At the same time, a number of foreigners jumped ship in the islands, a situation the government also wished to curtail; nonetheless, some deserters were permitted to remain, married local women and established their homes.

In the early part of the nineteenth century, small vessels were attached to the governor's office to service the Mariana Islands and the port of Cavite. In 1820, the schooner NUESTRA SENORA DE BUEN VIAJE, also called LA BIENVENIDA, sailed to Tinian for meat, then on to Saipan (LCM 18:48a). By now, both islands had small settlements of Carolinians that were overseen by an official from Guam who was appointed by the governor and known as the alcalde. Another schooner on the Tinian run was SAN JOSE. Governors Medinilla (1826-1831) and Villalobos (1831-1837) had small ships built to take care of local governmental needs (LCM 1:167a).

In 1825, reflecting the political disturbances brought about by the wars for independence in Spanish America, three Spanish ships arrived at Umatac from Peru on the way to the Philippines, a colony still loyal to Spain. At Guam, some of the crew mutinied, and the Spanish loyalists aboard were stranded and left to await later passage to Manila. One of the ships, CLARINGTON, was sunk off Umatac. The other three sailed back to Mexico (Duro 1972(9):328).

Toward midcentury, convicts from the Philippines began to be sent to Guam. A few arrived in 1849 (Safford 1901:305) and as many as 65 in 1851. Later, in the 1870s, when there was major political turmoil in Spain, large numbers of prisoners

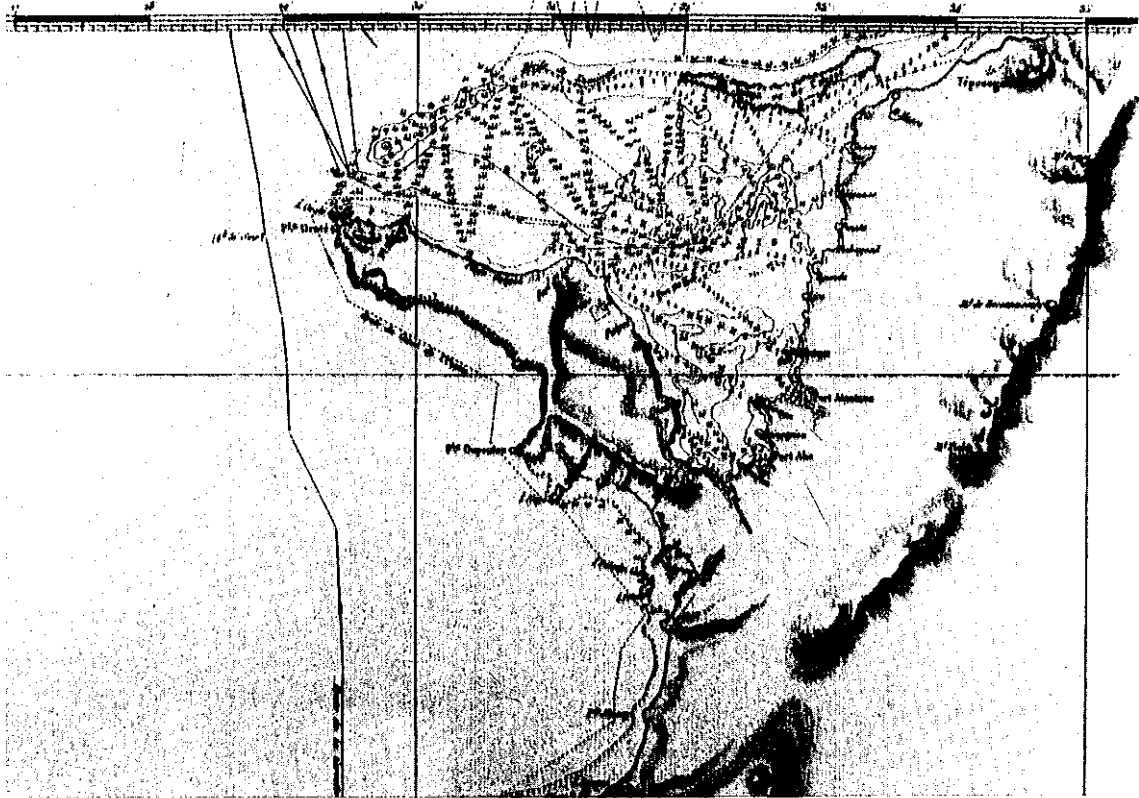


Fig. 4.9. Apra Harbor, ca. 1819, drawn by Duperrey.
(Courtesy of Micronesian Area Research Center Collection)

were exiled to the Marianas, destined for Guam, Rota and Saipan. As revolutionary activities accelerated in the Philippines, political prisoners from there were also sent to the Marianas. Among the first to arrive were those implicated in the 1872 uprising at Cavite (Driver 1976:26). Not surprisingly, some exiles and prisoners tried to escape aboard ships. Some were successful, others were recaptured before the ships sailed. The mail ships and other chartered vessels from Manila brought food and supplies to those confined to the three islands.

With the many vessels that arrived in the islands in the nineteenth century, occasional epidemics broke out. In 1856, for example, the American schooner FROST put in with smallpox aboard and, by the time the epidemic was spent, 3,644 inhabitants had lost their lives (Driver 1976:5).

In addition to the foreign and domestic trading vessels that sailed between Manila and the Marianas, there were itinerant vessels that plied the lanes between Australia, Manila and Hong Kong. Toward the end of the century, Yokohama was also included in such itineraries.

By 1851 there were locally based schooners officially authorized to work in the Marianas, which were owned by traders, some of whom were British, others American. Among the traders was one Holcomb, married to a Chamorro woman, who had his headquarters at Yap. Others were J. G. Johnston, who transported numbers of Carolinians to Tinian to work in the cattle industry and to the northern islands to work the copra plantations. In 1876, Johnston and several Carolinians were lost at sea while crossing from Tinian to Saipan in a small boat. During the 1880s, a Mr. Williams established a trading business and sailed his schooner between Guam, the northern Marianas, Japan, Manila and Hong Kong. Around this time, Japanese traders also began to ply the waters of the Micronesian islands.

On the local level, there were community brigs and other small vessels. Individual citizens, such as José Herrero and a Mr. Millinchamp, owned small boats that sailed to the neighboring islands and to the ports in southern Guam. They, too, suffered occasional mishaps and disasters. For example, in 1857 CHAMORRITA was driven on a reef, and in 1867 a boat was lost in the Agaña channel and a launch was lost at Merizo (Driver 1976:18).

In 1858 an English steam frigate sailing from the Hawaiian Islands put in at Saipan in search of wood for fuel for the leg to Hong Kong (Driver 1987:23). By 1875 steamers were sailing between Manila and the Marianas. Many were contracted mail boats; others were military vessels. In 1888

the mail run included a stop at Yap, which was indicative of Spain's interest in reaffirming its jurisdiction over the Caroline Islands in face of German encroachment there. Subsequent runs included stops at Ponape for the same reason.

The nineteenth century brought an increase in foreign shipping activity to the Pacific as a whole, not just to the Marianas. Between 1817 and 1852, the Marianas and other islands in Micronesia were visited by several foreign scientific expeditions, among them Russian explorers in 1817, 1818, 1819, 1825 and 1828; French expeditions in 1819, 1828 and 1839; and in 1852, a Swedish ship visited the islands. Several nations also sent warships to visit and reconnoiter, including the United States, Russia, Germany and Japan.

Foreign whaling ships were sighted in the islands as early as 1805 and began arriving in relatively large numbers after 1823. French, British and Anglo-American whalers began to provision at Guam and other islands in the Marianas and to use them as rest stations. As many as 30 ships a year came to Guam between 1820 and 1850. At Guam, they usually put in at Umatac to take on water and, from there, went on to anchor at Apra Harbor where they lingered long enough to reprovision and rest their crews (Corey 1971:81). The whalers brought small trade items, principally used clothing and tools to exchange for fresh provisions. The whaling business in the Marianas began to decline toward midcentury. By 1860 the whalers had begun to use ports in Hawaii, New Zealand and Japan, and only one or two ships put in at Guam each year.

As increased numbers of vessels plied the seas around the Mariana Islands, survivors of disasters at sea occasionally made their way to port in small boats. Among them were two whaleboats from SARAH MOERS in 1854 (Safford 1901:337) and in 1866 a barque from the Danish ship LIBELLE that wrecked at Wake Island. Survivors of LEONORA, sunk at Kusaie in 1874, reached Guam in a rowboat. In 1888 survivors of a German ship, F. H. DREWS, arrived at Saipan.

Ships were often overtaken by typhoons and damaged, lost at sea, or dashed against island shores. Among them was a three-masted vessel that sank off P'ogan Point near Pago in 1860 (Driver 1976:11). In 1872, during its Guam stopover, the mail boat MARIA DEL KOSARLO took Governor Luís Ibáñez y Garcia (1871-1873) on an inspection trip to the Northern Marianas. At Tinian, the ship was overtaken by a typhoon that drove it aground off the Sunharon roadstead. The survivors, including the governor, returned safely to Guam in a small open boat (Ibáñez 1976:206). A storm in 1891 drove the small schooner YAP onto the reef at Piti.

With the arrival of fairly large numbers of Carolinians in the Marianas after 1828, their sea-going canoes became indispensable to the interisland transportation system. The governor controlled at least some of the vessels because, in 1823, Governor Jose Montilla (1822-1823) turned over six Carolinian bancas to incoming Governor José Ganga Herrero (1823-1826). Two of these were lost at Rota and one off the coast of Guam. In 1848 three bancas of Carolinians from Saipan arrived at Agaña (Safford 1901:255), and the following year three bancas from Satagual (Satawal) and Lamusog (Lamotrek) put in with occupants who had come to settle on Saipan. They had come because their islands had been devastated by the great earthquake of January 1849, which had also caused major damage in Guam, especially at Umatac. There are reports of Carolinian bancas lost while sailing among the islands of the Marianas throughout the 1850s, 1860s and 1870s.

The revolutionary movement in the Philippines continued unabated, and more and more political detainees were sent to the Marianas. In 1896 the steamer CHARRUCA brought 57, followed by SATURNUS with 207 prisoners and VENUS with 120.

The nineteenth century brought an end to the galleon trade and its large, bulky, cargo ships. At the same time, there was an increase in shipping activity in the Mariana Islands, though with vessels of other types. In addition to the Spanish military and government vessels that serviced the Philippines, Marianas and Carolines, there were foreign ships crossing the Pacific in several directions. These included the American clippers that sailed from the east coast of the United States to China and passed through the northern Marianas, British vessels sailing between Australia and the Orient, and Japanese ships venturing into Micronesia. Some metropolitan powers sent warships to explore and reconnoiter and to conduct scientific expeditions, some of which, coincidentally, served their governments' political interests as well. Finally, there were trading schooners that plied the waters of the western Pacific from Hawaii to the coasts of China, Japan and the Carolines and centered their activities in the Marianas. The small local vessels, some of which were capable of reaching Manila, were used principally as interisland and coastal vessels.

The ubiquitous ocean-going canoes remained an active maritime presence until the end of the Spanish administration in 1898. During that last century, although there seems to be no mention of Chamorro-constructed, sea-going canoes or proas in the literature available for study, their place appears to have been taken by the Carolinians who retained their traditional shipbuilding and navigational skills and sailed

their bancas at will between the Caroline and Mariana islands.

Contact, Commercialization and Christianization

Caroline, Marshall and Gilbert Islands

The period from 1595 to 1696, a century of European activity in the Pacific, swept past the Caroline and Marshall islands without *so* much as a glance. The Spanish influence in Micronesia, in general, and in the Marianas, specifically, was directed to conversion of the islanders to Christianity and the Manila-Acapulco trade. The Portuguese, involved in a war in Europe, were unable to maintain their exclusive hold on the Spice Islands against the advances of the Dutch. After the successful voyage of Cornelis de Houtman around Africa to Java in 1596, the Dutch embarked on an ambitious program of aggression and commercial trade that saw them become the masters of trade in the Malay Archipelago within 50 years (Broek 1967:151).

The opening of the seventeenth century saw the institutionalization of a commercial rivalry in the Moluccas between the Dutch and the Portuguese and British. The British, unable to successfully sustain pirating in the Pacific, turned instead toward direct trade with the Indies. The British-owned East India Company was formed in 1600 with the express purpose of conducting trade in the region. In response, the Dutch East India Company, with extensive government support and exclusive rights, was formed in 1602 to serve as a conduit for trade and commercial expansion. In 1609 the rivalry with the Portuguese escalated when the Dutch asserted their claim to the Moluccas. By 1623 the Dutch were successful in forcing both the Portuguese and British from the area.

For the remainder of the seventeenth century, Portuguese influence waned and was all but eliminated in the Moluccas, and British commercial enterprises were limited to a part of India. While the Dutch were commercially active, exploration of the Pacific during the 1600s was concentrated in Indonesia, Melanesia, Polynesia, parts of Australia and New Zealand, with some limited activity in the North Pacific (Broek 1967:151-153). The only exception was the voyage of Gheen Huyghen Schapenham in 1624-1625. After rounding Cape Horn, the flotilla, known as the Nassau Fleet, crossed the Pacific to the Marianas and from there to the Moluccas. During the crossing the fleet came upon two islands at latitude 10° north. It is believed that the first island was either Fais or Ulithi, and the second was Yap (Broek

1967:157), These islands had been all but forgotten since their initial discovery in 1528 by Saavedra and again in 1542 by Villalobos.

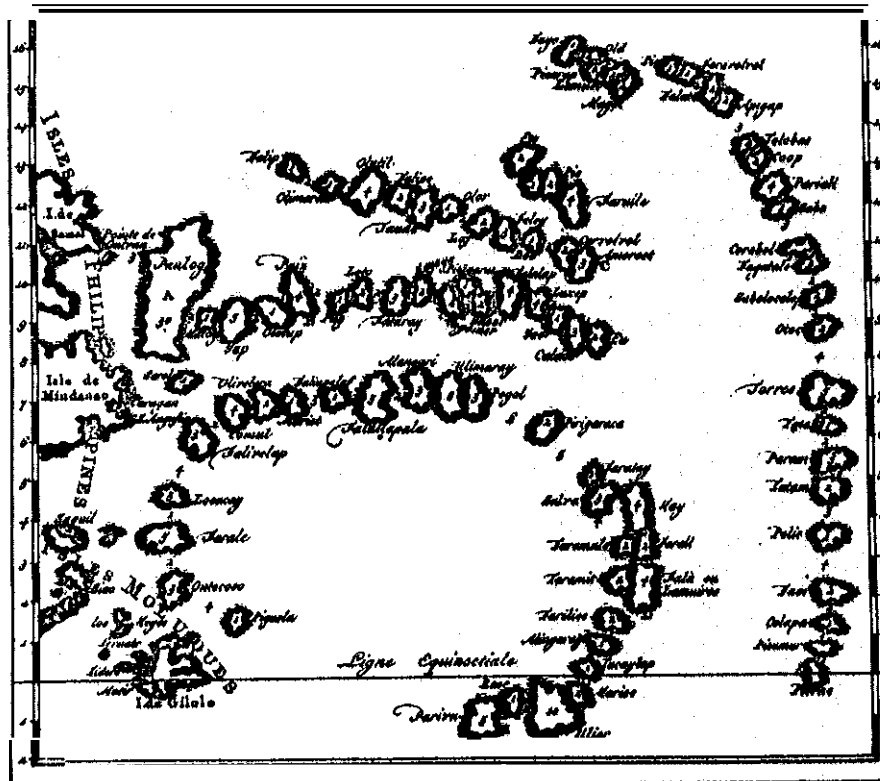
Contact 1696-1800--Carolinian Bancas, Missionary Ships, East India Merchantmen and Convict Ships

As a result of the concentration of efforts elsewhere, it was not until nearly a century after Quiros ran aground on Pohnpei in 1595 that a second wave of exploration and contact into the Caroline, Marshall and Gilbert islands was set in motion. Once again it was the Spanish who undertook the earliest voyages. This time, however, they were missionaries seeking new souls, not explorers seeking new lands.⁴

After interviewing a band of Carolinians blown to the eastern Philippines during a severe storm, Father Paul Klein wrote a passionate letter to the Superior General of the Jesuits in Rome urging expeditions into the area for the purpose of bringing Christianity to these people. The Carolinians described more than 80 islands that they were aware of or that made up their "nation" (Figure 4.10). Klein's letter, along with the sighting of "Isla de Carolina" by Lazcano in 1686 and confirmation by Rodriguez in 1696, the same year the Carolinians arrived, sparked the priests into action. The islands, referred to as the Palaos in 1696--and today known as the nation of Belau (Palau)--were otherwise unknown to Europeans, although Drake is suspected of having visited Palau in 1579 (Lessa 1975:253).

Three unsuccessful attempts to reach the Palaos--in 1697, 1708 and 1709--were mounted by the Jesuits. It was not until 1710 that Francisco Padilla in SANTISSIMA TRINIDAD reached Sonsorol, a Palaos outlier. This small island had been only briefly glimpsed during Magellan's voyage of discovery more than 180 years earlier. After a friendly welcome by the natives, Padilla allowed the two priests who were accompanying the expedition to go ashore. Before the priests could complete their visit and return to TRINIDAD, high winds and strong currents forced the ship away from the island. Because of the severe conditions, Padilla was unable to return to Sonsorol. However, in the process of seeking a route back, he did find Panlog (presently known as

⁴The following overview of the period of contact, commercialization and Christianization of the Caroline and Marshall islands draws heavily from the work of Fr. Francis X. Hezel, The First Taint of Civilization (1983), except where otherwise noted.



CARTE DES NOUVELLES PHILIPPINES.
KAART DLY NIEUWE PHILIPPYNISCHE EYLANDEN.

Fig. 4.10. Father Paul Klein's map of Palaos, 1696. (AGI, Leg 15, "Cartas de las nuevas Philippinas (Palaos) descubiertas debajo del patrimonio de Philippe V.") Also in Stocklein (1726 no. 127) and in Kramer (1917:17).

Babeldaob), the largest island in the Palaos. Other than Drake's brief visit in 1579, the Palaos remained isolated from European contact. The people of the archipelago were not even directly tied into the trading network of the western Carolines because they did not make long, interisland voyages (Hezel 1983:43).

Despite more than a century of seclusion, the reception Padilla received from the local people was not much different from the one given Drake. Unfortunately, the Palauans' desire for iron was met with resistance by the Spaniards on SANTISSIMA TRINIDAD; the result was a brief confrontation between the two groups. When Padilla left Panlong, he took with him the impression that Palaos was indeed still an "island of theeves."

Three efforts were mounted in 1711 to return to Sonsorol and rescue the two priests left the year before; each ended in failure. None of the ships was able to reach the islands, which were then being called Islas Encantadas, the Enchanted Islands. After 1711 Guam replaced Manila as the administrative base from which to launch further exploratory ventures to the Palaos.

In January 1712, Bernardo de Eugi departed Guam in SANTO DOMINGO in another effort to relocate the island and rescue the stranded priests. An accepted technique when travelling in unfamiliar waters was, if possible, to obtain the services of a local pilot. This was done with some regularity by the Portuguese when navigating through the Indian Ocean (Parry 1974:171,174-175). Because the report from the Carolinians stranded in the Philippines indicated that they were well acquainted with navigation between their own islands, Eugi reasoned that he might be successful in his mission if he could obtain a Carolinian guide.

After a week at sea, Eugi discovered a small group of atolls that he named Islas de Garbanzos, Chickpea Islands. These islets, known today as Ulithi, lay southwest of Guam in the western Caroline archipelago. After some difficulty and a confrontation that left one Spaniard and several Carolinians dead, Eugi kidnapped a native to serve as a pilot. With the aid of the Ulithian, SANTO DOMINGO was navigated to one of the northern islands in the Palaos. Upon arrival, Eugi again attempted to entice several natives to come aboard. This was finally accomplished and, with some difficulty, he had two more native pilots. Although one of the Palauans quickly escaped, the two remaining natives helped Eugi reach Sonsorol, well to the south of their original Palaos landfall. Unfortunately, winds and strong currents again prevented a landing and SANTO DOMINGO was forced to continue to Manila.

The second missionary voyage into Las Islas Carolinas occurred in the 1720s, following the arrival of a large group of Carolinians at Guam in June 1721. Blown off course and drifting for days, the natives of Woleai were quickly taken under the wing of Father Juan Antonio Cantova. Cantova learned the language of his charges and, when it was time for them to leave and attempt to return to Woleai, Cantova departed with them. Unfortunately, the islanders were again blown off course and ended up in the Philippines.

It was not until 1731 that Father Cantova attempted another missionary voyage into the Carolines, accompanied by Father Victor Walter. The two priests, along with a small contingent of soldiers, sailed from Guam to Ulithi and from there to Falalap, another islet in the group. At Falalap they were greeted with a good deal of enthusiasm by the populace who quickly adopted the teachings of the two priests. After several months in the islands, Cantova sent Walter back to Guam to obtain needed supplies and possibly two additional priests for the mission. During the return voyage, the ship was blown off course to the Philippines before eventually making its way back to Guam. Two years passed before Father Walter returned to Ulithi in June 1733, only to find on arrival that Father Cantova and the soldiers who remained on the island had been killed shortly after Walter's attempted voyage to Guam (Burney 1817:18-29). The death of Father Cantova ended the mission on Ulithi and halted Spanish missionary interest in the Carolines for nearly 50 years.

The only other Spanish activity in the Carolines occurred in 1733. The Manila-Acapulco trade was flourishing along the more northern routes, but in that year CONSOLACION sighted Ngetik in the Carolines while on a trading voyage to South America (Hezel 1983:83).

In other areas of the Pacific, the first half of the eighteenth century saw an aggressive and reorganized British East India Company break out of India and establish direct trade with China. This was accompanied by an increase in British-sanctioned privateering by Dampier, Woods-Rogers, Anson, Clipperton and Shelvocke. As a result, the Dutch were put on the defensive, and ultimately the Dutch sphere of influence was limited to the Malay Archipelago. In the mid-1700s Britain's official interest in the Pacific was basically commercial rather than colonial. Exploration in the region was encouraged in order to discover producing areas, develop trade monopolies, and discover access routes to home markets. Circumnavigations undertaken were no longer privateering enterprises; rather, they were sponsored, equipped and directed by the government as part of a national

program. To further British commercial aims, the expeditions were mandated to search for two geographical features, the Northwest Passage, presumed to lay north of Cape Mendocino, and a great southern continent south and west of Cape Horn (Ruggles 1967:238).

The first of several government-sponsored voyages, that of John Byron (1764-1765), resulted in sightings of islands in Polynesia and the Gilbert Islands. Byron, in HMS DOLPHIN, discovered Nikunau in 1765 and named it Byron Island. The voyage of Samuel Wallis and Philip Carteret (1767-1768) was authorized specifically to search for the southern continent, Terra Australis. During the passage through the Straits of Magellan, the two vessels under the commands of Wallis and Carteret, respectively, became separated during a storm. Believing that Carteret's SWALLOW had sunk, Wallis attempted to work his way west and south. After reaching 37° south, Wallis followed the trade winds northwest toward the equator. He traveled through the Tuamotu and Society islands in French Polynesia and eventually reached the Marshall Islands, where he made several discoveries (Ruggles 1967:239).

Carteret, in a leaking and deteriorating SWALLOW, managed to clear the Straits of Magellan after spending four months battling wind and storms and was forced to sail north to Juan Fernandez Island before continuing his westward journey. Carteret eventually turned west by south and sighted Pitcairn Island before returning to the normal cruising latitudes; he is credited with several discoveries in the Caroline Islands, not the least of which are Pulo Anna, Merir, Sonsorol, Tobi and Helen's Reef. Another of Carteret's important discoveries was the naming and first use of the straits separating New Britain from New Ireland, and New Ireland from New Hanover in the Bismarck Archipelago. Carteret's 1768 exploration of the southeast and north sides of New Guinea, complementing those of Dampier from 1679-1691 of the passage off the northwest tip of New Guinea, would firm up the route to be followed by numerous British East Indiamen into Melanesia and Micronesia for the balance of the century (Ruggles 1967:240).

The climax of the British age of circumnavigation and government-sponsored expeditions were the voyages of Capt. James Cook between 1768 and 1780. Among his many achievements, including discovery of the Hawaiian Islands, Cook proved that there was no great southern continent and set the stage for Vancouver to finally disprove the theory of a Northwest Passage (Ruggles 1967:238-244). Because of Cook's ability as a marine surveyor and leader, the navigational charts and information he produced on places for reprovisioning in the Pacific were used extensively for many

years. Cook also proved it was possible to all but eliminate scurvy and other diseases resulting from long-distance travel.

The regular convoys of British ships after 1780, en route around the Cape of Good Hope and through the Indian Ocean to Canton, passed through the Dampier Strait off the northwest tip of New Guinea and continued northeast in an arc that brought them close to the western Caroline Islands of Palau before turning back to the Chinese mainland. East India merchantmen taking this route known as the Inner Passage made regular discoveries of islands in the Carolines, some of which were named for company ships such as Lord North's Island (Tobi) and Helen's Reef (Stevens 1808:634). The years after 1780 saw European knowledge of the geography of the western Caroline Islands become steadily refined and detailed.

One of the most famous of these discoveries, although by accident, was the wreck of the British East India Company packet ANTELOPE off Palau's western reef in 1783. This encounter irrevocably forced Palau from its lengthy isolation into direct European contact. Early British involvement in the island's internal affairs would prove to have repercussions that have continued to this day.

Cook's description of Australia's New South Wales coastline eventually led to the establishment of the first British settlement in the Pacific at Port Jackson. Capt. Arthur Phillip, in command of a fleet of eleven ships referred to as the First Fleet, brought in the first group of convicts and supplies to the new settlement in 1787. The settlement in Sydney Harbor was destined to become

...for the South Pacific what Honolulu was to be for the North--the major port-of-call for ships entering and leaving the Pacific, an entrepot for trade between East and West, and eventually a supply point for white settlers in the islands beyond. It was from this base that the British whaleships and merchantmen would sail forth into the Carolines and Marshalls for the next four decades...(Hazel 1983:64).

Like so many that followed them, the ships of the First Fleet, once they had relieved themselves of their human cargoes, made north for Canton to pick up Oriental goods before returning to England. In the process, the captains took their ships well around to the east on a course that was

eventually called the Outer Passage. This route took British shipping through portions of the Gilbert, Marshall and eastern Caroline islands that had been nearly forgotten. In 1787-1788 Capt. Thomas Gilbert in CHARLOTTE and William Marshall in SCARBOROUGH took their ships of the First Fleet into the islands that now bear their names. In the Gilbert Islands, they rediscovered Quiros' Buen Viaje, renaming it Touching's Island. Marshall named the other principal atolls Allen's, Gillespie's, Clarke's, Smith's and Scarborough Island. Gilbert named Abaing Matthew's Island after the owner of his ship. He also sighted Tarawa and named the three northernmost atolls Gilbert's, Marshall's and Knox's islands. Marshall sighted Aranuka and named the eastern and western ends Hopper's and Henderville's islands, respectively. Together Gilbert and Marshall discovered Kriua and named it Woodlæ's Island.

Two other ships from the First Fleet, ALEXANDER and FRIENDSHIP, worked their way through the Solomon and Russell islands en route to Canton when, in need of food and water, they made a landfall in the Palaus. During their brief stay, Captain Shortland noted that the natives had iron adzes of "European manufacture" and occasionally used Spanish words (Phillip 1789:208-212). Just five months before the arrival of ALEXANDER and FRIENDSHIP in September 1788, another British ship had briefly stopped in Palau. IPHIGENIA, under the command of Capt. William Douglas, visited Tobi and Palau in 1788, while en route to the Pacific Northwest coast on a fur-trading expedition. The value of furs from the Northwest to the merchants in the Orient was another of Captain Cook's discoveries.

Other discoveries in the eastern Carolines and Marshalls by British merchantmen taking the Outer Passage included those of Capt. Henry Bond on ROYAL ADMIRAL; he sighted the atolls of Namorick and Namu in the Marshalls in 1792. British ships were regularly reporting sighting islands in the vicinity of Yap and Sorol in the western Carolines between 1787-1793. The ship WARREN HASTINGS made a landfall at Ngulu Atoll south of Yap in 1787. In 1793 Captain Musgrave in SUGAR CANE and Capt. William Raven in BRITANNIA named Musgrave Island (Pingelap) and Raven Island (Ngetik) in the eastern Carolines. The islands that comprise Enewetok Atoll in the Marshalls were sighted by the crew on WALPOLE in 1794 and again by the crew on HUNTER in 1798. In 1795 Captain Mortlock, in YOUNG WILLIAM, gave his name to the islands in the Carolines that today are called Nomoi. He is also the discoverer of Puluwat Island west of Truk. In 1797 Captain Dennett also reported several new islands in the Marshalls. The Gilberts were further explored and reported on in 1798 by Captain Fearn and in 1799 by Capt. Charles Bishop. Bishop, in the brig NAUTILUS, sighted Abemama and named it Roger

Simpson's Island after an associate who was on board. Although fewer in number, Spanish ships were occasionally in the region as well. A Spanish captain, Ibargoitia, sighted the atolls of Puluwat, Pulusuk, and Pulap in 1799 and again in 1801, while on a trading voyage (Ruggles 1967:247; Hezel 1983:82-83).

While the Mariana Islands were effectively cut off from the rest of Micronesia, the influence of European civilization was spread through the Carolines and to a lesser degree the Marshalls by the Carolinians themselves. The intermittent canoe voyages that did occur were primarily by accident, and when the islanders finally returned to their homes, stories of the cruelty of the Spaniards only served to frighten the populations. Only two purposeful trading voyages from the Carolines to Guam, in 1787 and 1788, are recorded. Several canoes from Lamotrek, led by an islander named Luito, travelled to Guam in order to trade for iron and metal tools. Although the islanders were cordially received by the Spaniards and encouraged to return, their failure to return to Lamotrek from the second voyage again halted interisland travel (Hezel 1983:103).

Commercialization and Christianization 1800-1880--
Carolinian Bancas, East India Merchantmen, Trading
Schooners, Naval Cruisers, Whaling Ships, Missionary
Ships and Blackbirders

It was not until after the turn of the century that Carolinian bancas once again began to appear on the shores of Guam. The fears of the Carolinians were allayed by the voyage of Don Luis Torres in 1804. Senor Torres sailed to many of the islands in the western Carolines. He invited the islanders to resume their trading voyages and reassured them that they would be well received by the Spanish. As a result of Torres' efforts, voyages to Guam resumed and continued through most of the century (Hezel 1983:104).

European discoveries in the Pacific as well as in the Caroline, Marshall and Gilbert islands continued into the 1800s; however, exploration in this century provided no great new continents, islands or passages. Activity in the region during the first quarter of the nineteenth century can be characterized as predominantly trading, sea-hunting, missionary work, some marine surveying during naval cruises, scientific analysis of the ocean basin, and exploration of the South Pacific and Australia's coastline (Ruggles 1967:250).

By 1800, the stage had been set for the next wave of European influence and commercial activity--the traders, naval-based scientific explorers, whalers, missionaries and

blackbirders. At the turn of the century, Micronesia was crisscrossed by three distinct trade routes,

British merchantmen, and occasionally the American ships that called at Port Jackson ... made their way north through the islands on their passage to China. American ships, sometimes after spending time on the Northwest coast to pick up a cargo of furs, crossed the Pacific in the low northern latitudes to take advantage of the trade winds on their way to China. Finally, Spanish vessels from the Philippines put out to the islands to the east in search of produce that might be sold to Chinese merchants. ...the Micronesian islands just happened to be on the trading lanes, and so were accidentally discovered... (Hezel 1983:84).

Independent Traders and Naval Expeditions

Discovery and contact became, as never before, a true by-product of trade. Banaba in the Gilberts was first reported on by Capt. Jered Gardner of the American ship DIANA, who sighted the island on January 3, 1801, and named it Rodman Island. In 1802 the crew of COROMANDEL sighted several islands in the Carolines in the vicinity of Truk, including Nama and Losap, southeast of Truk, and Murilo and Nomwin in the Hall Islands north of Truk. Between 1803 and 1811, several islands in the Marshalls were sighted. The crew on ROLLA sighted Jaluit in 1803, and Capt. John Patterson on ELIZABETH sighted it again in 1809. Patterson is also credited with the first sighting of Mariana and Arorae in the Gilberts, which he named Hall's Island and Hope's Island, respectively. In 1804 Capt. John Mertho on OCEAN discovered Ujae and Kwajalein in the Marshall Islands and rediscovered Banaba in the Gilberts and named it after his ship. The crew on PROVIDENCE located Ujelang in the Marshalls in 1811 and named it Providence Island. Captain MacAskill on LADY BARLOW named Macaskill Island (Pingelap) in 1809, and Captain Betham on MARQUIS OF WELLINGTON named Wellington Island (Mwokil) in 1815, both near Pohnpei. In 1806 the Spaniard Monteverde on PALA discovered Nukuoro, a Pohnpei outlier, while Dublon on SAN ANTONIO named an island after himself in Truk in 1814 (Ruggles 1967:247; Hezel 1983:82-83).

The interest of the United States in the Pacific began with the China trade and the need to find marketable goods to exchange for teas and silks. American discoveries in the

region began in 1799 when Ebon in the Marshall Islands was sighted by crewmen on the merchant ship ANN AND HOPE. The trading ships HOPE, in 1801, and NANCY, in 1804, each sighted Strong's Island (Kusaie) in the Carolines. In 1809 TONQUIN made the first recorded sighting of Kapingamarangi in the eastern Carolines (Hezel 1984:84).

Fur-sealing along the Pacific Northwest coast, exploited first by the British in 1785, quickly dominated the China trade. However, because of the restrictive monopolies of the British East India Company and the South Seas Company, along with Britain's involvement in the Napoleonic Wars, their trading on the coast was limited. The trade in sea otter skins from the northwest coast and sealskins from sub-Arctic and Arctic islands was rapidly monopolized by Americans after the turn of the century. After filling their holds, the ships would sail south down the coast and, using the same trade winds that propelled the Spanish galleons from Acapulco to Manila, sailed to Canton to obtain teas and silks. The fur trade was short-lived, however, rapidly declining after 1810 and no longer dominating the trans-Pacific trade after 1815. By 1830 the seals were nearly extinct and the trade ended (Bertand 1967:256-260).

While the fur-trade was declining, entrepreneurial captains ventured into Micronesia to seek other cargoes that could be sold in China. The private traders, many of them American, quickly moved to exploit the wealth of the islands.

Sandalwood, beche-de-mer, mother-of-pearl, turtle shell, and edible birds' nests were the most commonly sought articles, and the search for islands that might serve as abundant sources of supply occupied traders throughout much of the nineteenth century. Ships sailing from Liverpool or Boston would make for the Pacific Islands with a cargo of cheap ironware, calico and gingham, bric-a-brac, muskets and powder, or whatever else they thought would interest the islanders. They would cruise the area until they had picked up a full cargo ... which was then carried to a Chinese port and traded for oriental commodities (Hezel 1983:85).

These trading voyages introduced a variety of manufactured goods to the islanders and increased their desire for iron.

Shortly after the turn of the century, government-sponsored naval expeditions, with a mandate to conduct scientific

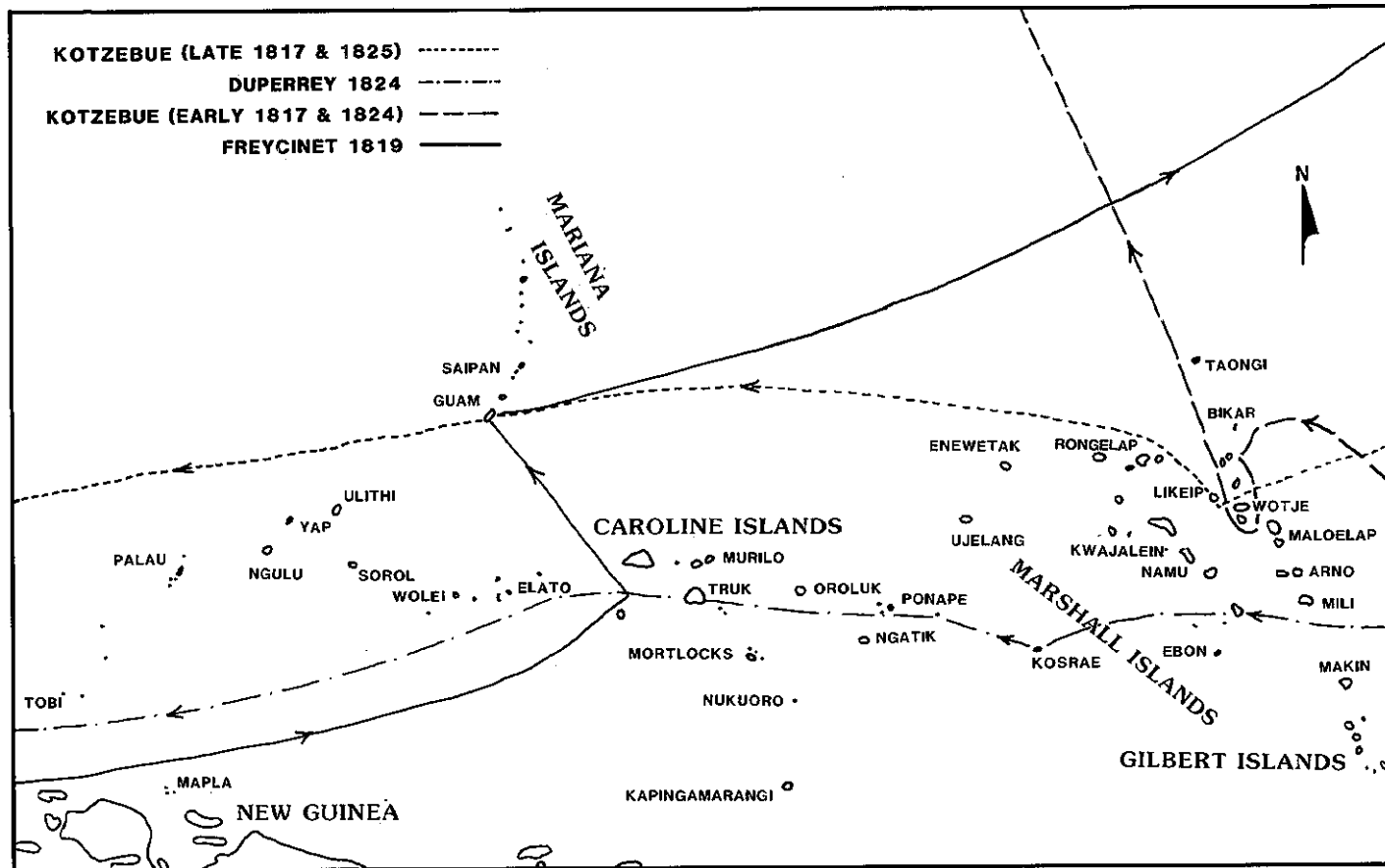


Fig. 4.11 Naval-based scientific expeditions

exploration, hydrographic studies, and accurate charting of islands and reefs began in earnest (Figure 4.11). While in the Gilbert Islands, Duperry was the first European to sight Marakei. The majority of these voyages occurred between 1815 and 1842 and had a significant impact on the Caroline and Marshall islands.

Russian interest in the Pacific was piqued when the Russians became serious competitors in the fur trade and desirous of a larger share of the China market. Two voyages commanded by Lt. Otto Ye. Kotzebue resulted in many important discoveries in the Marshall Islands. On his first voyage, from 1815-1818, Kotzebue was mandated to search for the illusive Northwest Passage and to undertake geographical research in the Pacific Ocean. Although Kotzebue's search for a passage was unsuccessful, it did result in an increase in detailed information on many of the islands off the northwest coast of America along with the discovery of Kotzebue Sound.

During the unfavorable winter months of 1816-1817, Kotzebue took his brig RIURIK into the Marshall Islands and the Tuamotu Archipelago. The true position of the Marshall Islands was finally delineated during that stay. Kotzebue also discovered that the Marshall Islands consist of two parallel series of island chains, the eastern Ratak Chain and the western Ralik Chain. The Ralik Chain was only traversed; however, Kotzebue carefully mapped and studied the Ratak Chain (Figure 4.12).

Kotzebue's second voyage, from 1823-1826 on the sloop PREDPRIATIE, involved a return to the Marshall and Tuamotu islands. He made numerous astronomical observations, studied the temperature and specific weight of ocean water, and again carefully described the coral atolls visited. As a result of Kotzebue's two voyages, 11 islands in the Marshalls were mapped, along with 4 in the Tuamotu Archipelago and 1 in the Society Islands (Lebedev and Grekov 1967:191-193).

Another Russian explorer, Capt. Fedor P. Lutke, was commanded to conduct scientific observations in the Pacific during a circumnavigation lasting from 1826-1829 (Figure 4.13). On board the sloop SENYAVIN were two naturalists, Karl H. Martens and Aleksandr F. Postels, and an ornithologist, Freidrich H. de Kitlitz. From November 1827 to the end of 1828, Lutke sailed throughout the Caroline Islands, systematically investigating and describing them. One group, named after his ship SENYAVIN, was virtually unknown to Europeans. Lutke's surveying expedition in the Carolines visited nearly every inhabited atoll short of Yap and Palau. His accomplishments included the rediscovery of Ponape (Pohnpei), forgotten by Europeans since Quiros' visit in 1595, and extensive geodetic work and description of natural

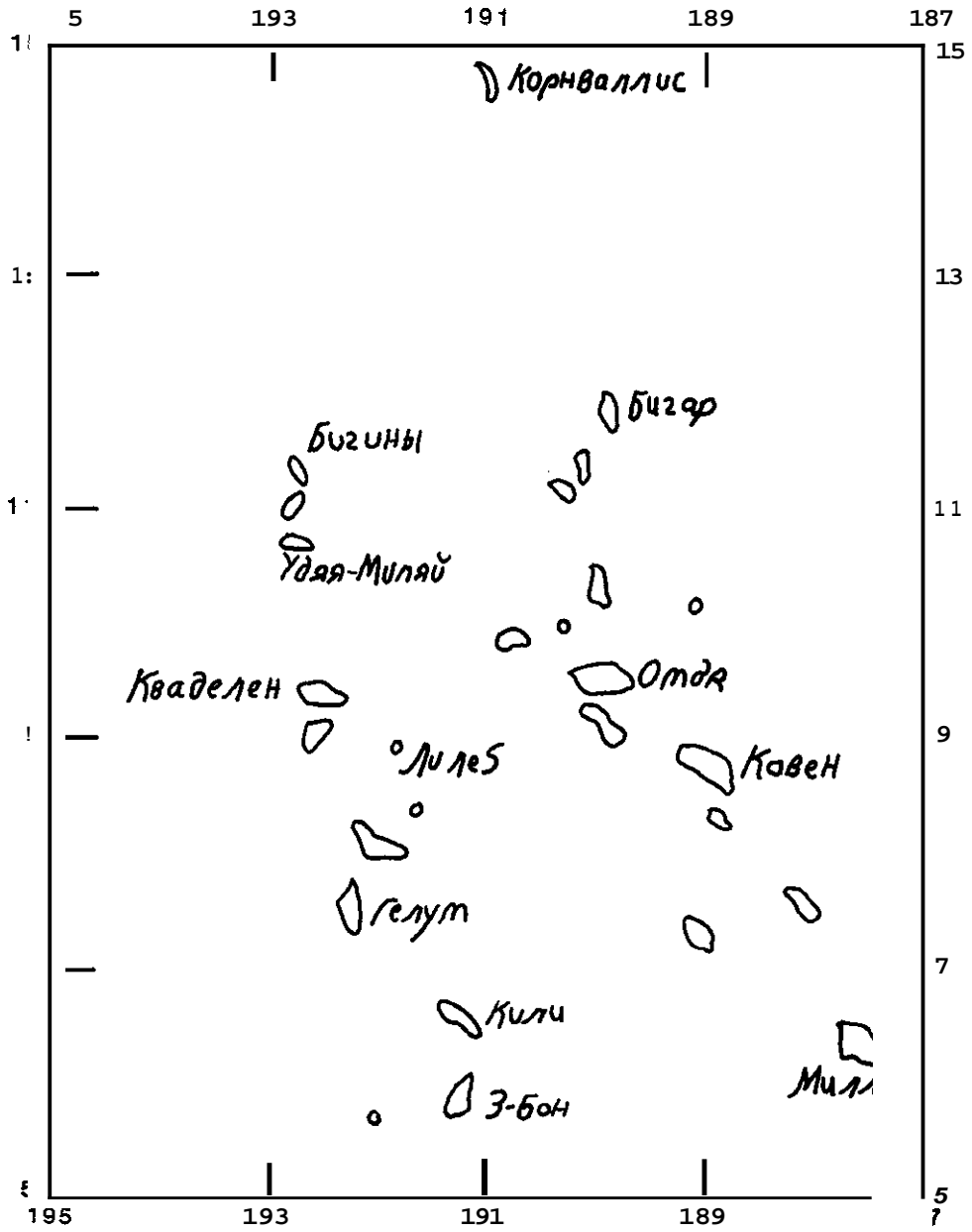
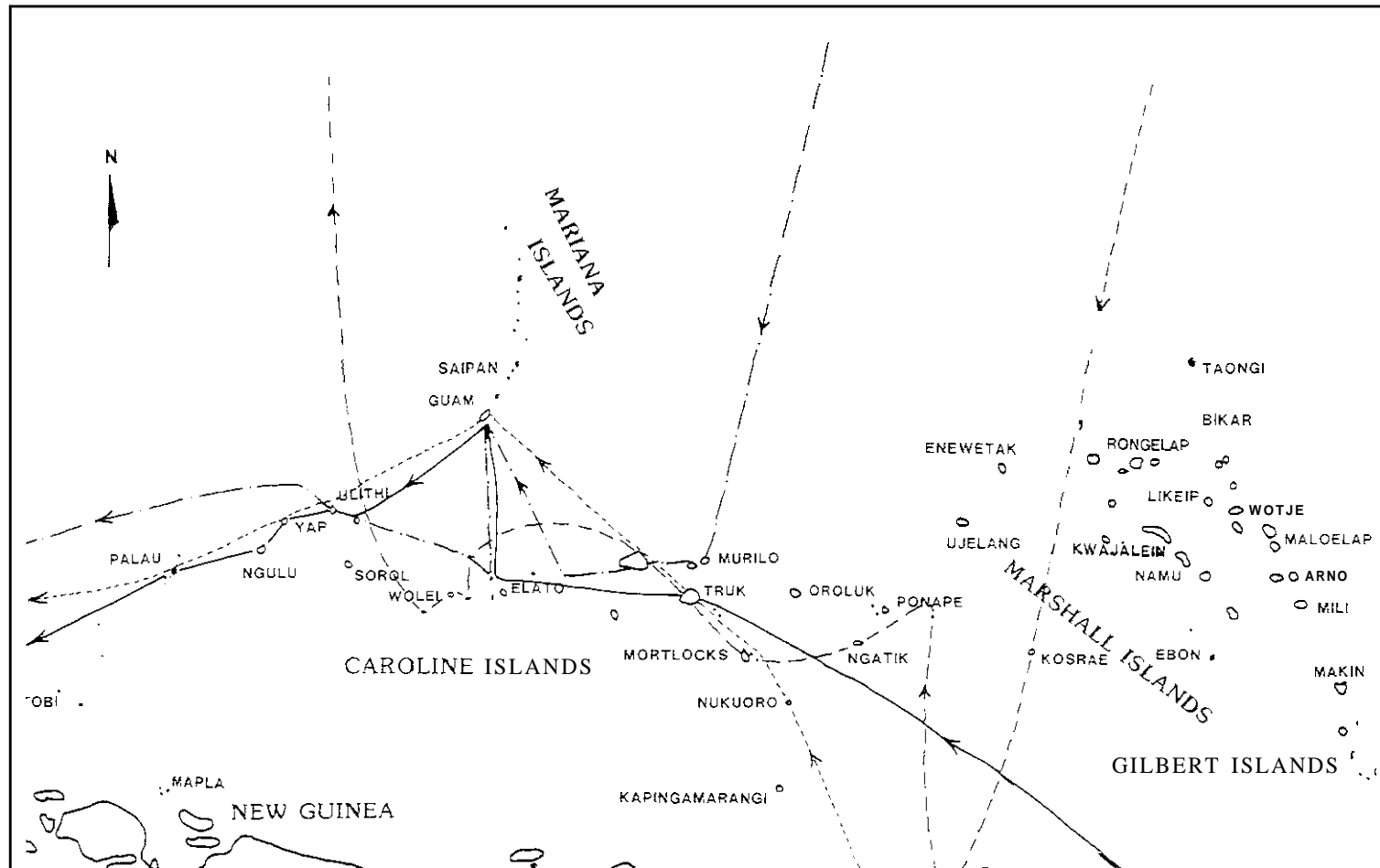


Fig. 4.12. Map of the Ralik Islands in the Pacific Ocean. Redrawn from Otto Ye. Kotzebue's Atlas, 1821-1823.



D'URVILLE 1828 ———
 D'URVILLE 1838-39 ·····
 LUTKE (DEC 1827-APR. 1828) - - - -
 LUTKE (DEC 1828) - · - · -

Fig. 4.13. Naval-based scientific expeditions, 1828-1840.

conditions and the population of the islands (Lebedev and Grekov 1967:193-194; Hezel 1983:90),

Other Russian cruises to the Pacific included the two voyages of V.S. Rhromchenko in the ship ELNA from 1828-1830 and in the transport AMERICA in 1831-1833. Khromchenko collected information on and described several of the Marshall Islands. The transport AMERICA was again in the Marshall Islands from 1834-1836 under the command of I. I. Schantz. Schantz discovered 13 uninhabited islands in the Ralik Chain, which he named the Schantz Islands and which are today known as Wotho Atoll (Lebedev and Grekov 1967:198).

When Kotzebue arrived in the Marshall Islands in 1816, he discovered that for all of the activity in the region, these islanders had been left nearly untouched by European influences. They had only tools of wood and shell, simple woven garments and baskets. He also found they were still making voyages in their graceful, double-ended canoes, equipped with a single outrigger for balance. Kotzebue distributed knives and hatchets to the islanders and left goats and pigs on Wotje. He even had one of his officers plant a garden and left seeds with the islanders to supplement their food crops. Eight years later when Kotzebue returned to the islands, he found that the foodstuffs he had left were in common use and that the pigs and goats were being raised on the island of Aur. In general, Kotzebue described a picture of Marshallese life that was not much different from that described by Cantova nearly a century earlier in the central Carolines (Hezel 1983:92-94).

In decided contrast to the Marshalls, the Mortlock Islands were well acquainted with western culture. When Lutke arrived in 1828, he noted that axes of shell were no longer in use, having been replaced by iron (Lutke 1835(2):1091). The Mortlocks, in addition to being part of a trading network that included canoe trips to Guam for iron and other goods, were also receiving visits from the few whaling ships that were beginning to enter the region. As a result, the Mortlockese were more sophisticated than the Kosraeans Lutke had visited and were no longer interested in glass beads or other trade items. The presence of dogs, cats and fowl on the islands also spoke of western influence. At each atoll visited, there was heavy Mortlockese trading of chickens for knives, scissors and axes. Lutke characterized the islanders as "... a people that understands trade and knows how to use it to [their] own interests" (1835(2):63).

The French, who had a reputation for scientific exploration and inquiry, were not sitting idly by while the Pacific was being explored by other nations. Voyages undertaken by the eighteenth-century French explorers De Bougainville

(1766-1769), De Surville (1769-1770), De Fresnes and Crozet (1771-1773), Le Perouse (1785-1788), Marchand (1790-1792) and D'Entrecasteaux (1791-1793) concentrated in the South Pacific Ocean, New Zealand, Australia, Indonesia, South China Sea, Alaska and the Kuril Islands. The first nineteenth-century voyage into the Pacific was captained by Nicholas Baudin (1800-1803). Baudin sailed LE GEOGRAPHE and LE NATURALISTE along more than 3,000 nautical miles of Australian coastline, as well as a portion of Tasmania and New Guinea, while making a detailed survey and collecting information on animals, plants and the native populations (Garry 1967:204-205, 209).

The French began exploration of Micronesia with the voyage of Louis de Freycinet during 1817-1819. Freycinet had been a cartographer on the Baudin expedition and was mandated to "...engage in various scientific observations on the physics of the globe" (Garry 1967:214). The frigate URAMIE left Toulon in September 1817 and steered for Mauritius and Australia. Freycinet spent a short time off three atolls near Truk and eventually arrived at Guam, where he spent more than two months reprovisioning (refer to Figure 4.11). During his stay at Guam, Freycinet gathered the information upon which he based his description of the Carolines included in the expedition documents.

Following in Freycinet's footsteps, a former lieutenant under Freycinet, Louis Isidore Duperry, captained the corvette COQUILLE through Polynesia, parts of Melanesia and around Australia from 1822-1825. During May and June 1824, COQUILLE traversed the Gilbert and Caroline islands while collecting information in the natural sciences and reporting on their geography (refer to Figure 4.11). While in the Gilbert Islands, Duperry discovered Marakei. Duperry also surveyed part of Truk lagoon and described Kosrae (Garry 1967:215; Hezel 1983:90-91).

The expeditions of Jules S.C. Dumont d'Urville made major contributions to knowledge of the western Pacific. His first voyage, in Duperry's reliable COQUILLE refitted and renamed L'ASTROLABE, was charged with continuing his former captain's work and with exploration of the Carolines and Palaus and approaches to New Guinea (Figure 4.13). After surveying the south of Australia, Tasman Bay and a portion of the New Guinea coastline; discovering a pass between New Zealand's northern shore and an island in Cook Strait; undertaking a geographical study of the Fiji Islands; searching for the remains of the La Perouse expedition lost in the Santa Cruz Islands; and completing the survey of Truk in April 1828, L'ASTROLABE made for Guam to reprovision. Plans to carry out extensive surveys of the Carolines and Palaus were aborted

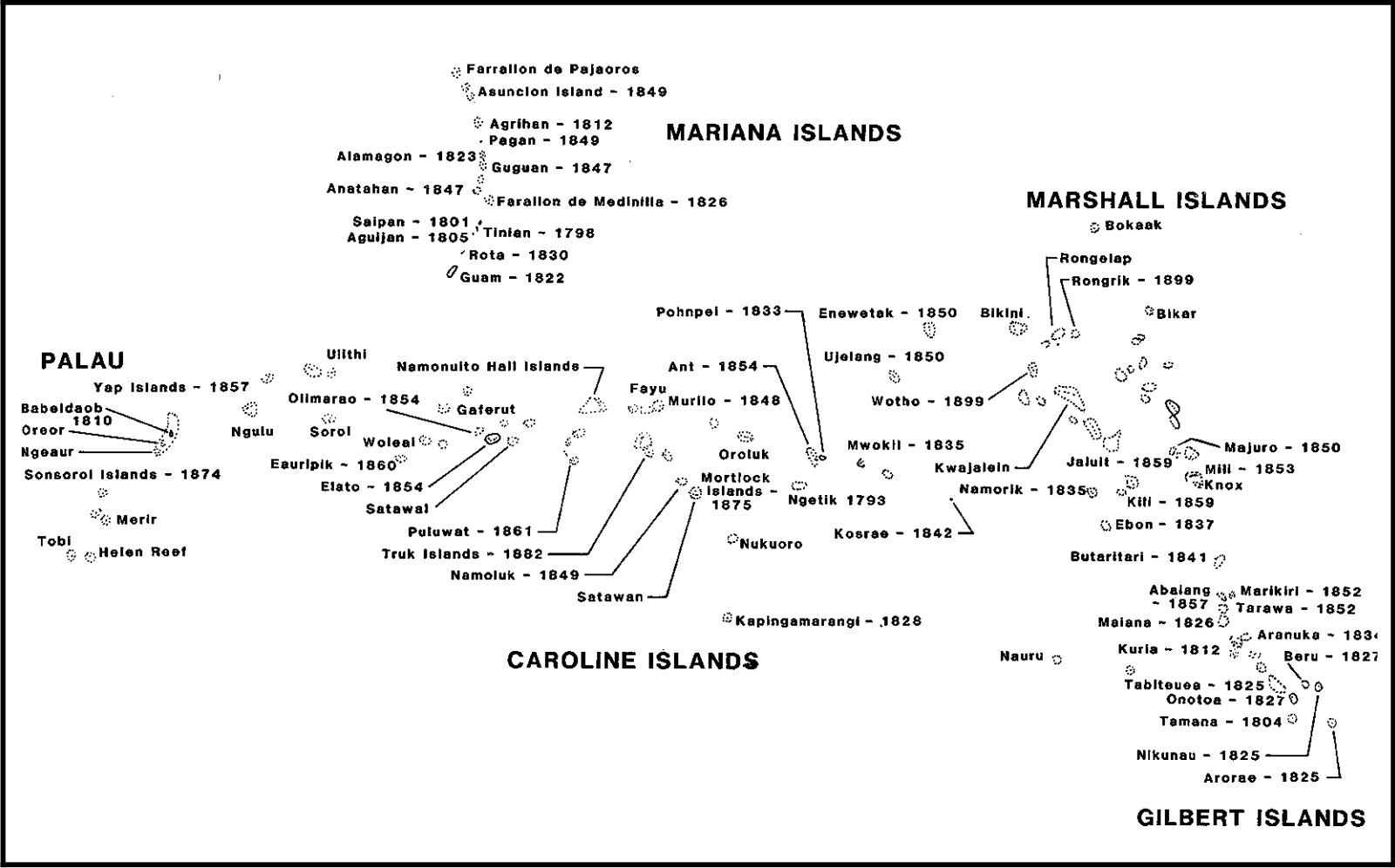


Fig. 4.14. Dates of first visits by whaling ships to Micronesian Islands.

because of the ill health of his crew (Garry 1967:215-218; Hezel 1983:91).

In 1837 d'Urville began his second voyage into the Pacific. He was instructed to examine the potential for whaling in the South Polar regions and to extend his explorations in Oceania (refer to Figure 4.13). Under his command, the corvettes L'ASTROLABE and LA ZELEE skirted the Antarctic continent and visited the Marquesas, Tahiti, Samoa, Fiji, Loyalty islands and the Louisiade Archipelago (Garry 1967:219-220). During December 1838 and January 1839, d'Urville stopped at Palau and Yap; however, the majority of his work in the Carolines focused on Truk. The study of the natural life and the descriptions of the people of Truk were the first by Europeans who actually set foot on the island (Hezel 1983:91).

The conclusion of d'Urville's second voyage in 1840 brought to an end the French era of exploration in the Pacific as well as the end of European discovery in Micronesia. By 1840 most, if not all, of the islands had been charted and the detailed descriptions of the people and islands by European and American explorers filled hundreds of volumes.

The island of Kosrae to the east of the well-aculturated Mortlocks was still unaffected when visited by the French Captain Duperrey in 1824. The islanders followed the Frenchmen and were amazed at their white skin and clothing. The Kosraeans were unacquainted with iron and had to be shown how to use iron hatchets (Lesson 1839:459-514). Three years later, however, Lutke found that iron hatchets were in common use on the island (Nozikov 1946:130). Surprisingly, the people of Truk, the nearest neighbors to the Mortlocks, were still unaffected by outside influences a full 10 years after Lutke's visit. When the trading bark PERU lay off an island in the lagoon in 1832, Captain Eagleston noted that the islanders "... have had little or no intercourse with other nations" (Eagleston in Ward 1967(2):496-498). In 1838, Dumont d'Urville found the people of Truk suspicious of the French although desirous of iron as well as other trade items (Dumot d'Urville 1843:120-167, 309-328).

Overall, the cultures in the eastern Carolines that were being described by the Russian and French explorers were traditional and little affected by outside influences. However, the visits of Europeans were increasing and changes were occurring rapidly. Certainly, the influence of Western contact was more pronounced the farther west one moved through the islands and the closer one got to Guam. Lutke noted that the Carolinians he met on Guam were very different from those in the outer islands.

They wear red shirts and straw hats; they say "adios" and "si señor," But with this "civilization," they are to their free countrymen as a caged parrot is to the magnificent flocks that enchant the traveler in the forest. They are losing their culture completely. There is not even the shadow of that uninhibited cheerfulness that they had before. There is a certain trace of sadness in their forced smile ... (Lutke 1835(2):123-124).

On Woleai, an island that experienced heavy traffic with the Marianas, Lutke observed that the hospitality of the islanders was much less than he had received elsewhere and that thefts were more frequent. He concluded that "... the more contact natives have with civilized men, the more corrupt they become" (Lutke 1835(2):301).

The influence of Western culture, brought more and more frequently to the islands by independent traders, continued to grow throughout the first half of the nineteenth century. In November 1833 the brig SPY, on a beche-de-mer voyage, arrived at the island of Ponape to trade and reprovision. Like many of his contemporaries, Captain Knight found the island to have good harbors and an "... unlimited quantity of firewood and most excellent water" (Wilson 1841). A variety of foodstuffs could be easily obtained, and the islanders were friendly. Ponape was considered "... an island very well worth the attention of whalers" (James 1835).

In the five short years since Lutke had rediscovered the island, Ponape had already made something of a reputation for itself. British whaleships out of Sydney and merchant vessels on their run from Australia to China were beginning to make the island a regular port of call. With them came the convicts from the penal colonies in Australia, either as stowaways or as seamen the captains were usually only too happy to be rid of these men by the time they reached the first stopover. ...These runaway convicts ... became the first white men to live for any length of time on the island (Hezel 1983:110).

Ships trading for beche-de-mer and tortoise shell roamed throughout the Caroline and Marshall islands. Kosrae, like Ponape, was also a popular layover. By 1835 the Kosraeans had gone from near isolation in 1824 to having "... not less

than thirty runaways on the island ... many of them convicts" (Sydney Gazette August 2, 1836). Tensions between Western influences and demands upon the islanders and the Kosraean traditional ways came to a head in 1835 when the brig WAVERLY arrived at the island.

Sailors from the brig either coerced or kidnapped women on the island and took them on board WAVERLY. The incident that followed was described in a newspaper story and was based upon the eyewitness account of the high chief.

White man want to get gal go aboard ship. King no like. In night white man take plenty gal go aboard ship. In morning, kanaka go board ship; big island, small island, all go and kill every man board ship. White man kill some kanakas. Then kanakas take chests, small things ashore, then set fire to ship; burn sails, rigging, spars, casks, everything belong to ship. Every white man kilied (The Friend, November 1854:82).

The attack on WAVERLY was repeated a few months later when the trading schooner HONDURAS visited the island. With the exception of the mate and steward, the crew was killed. In this instance, the two survivors escaped with the ship, obtained crewmen from Ponape and eventually made their way to Hawaii (Ward 1967(3):541-546).

As the number of ships moving through the region increased so did the opportunity for conflict. Attacks on trading ships, although not frequent, did occur, more often than not as a result of some real or imagined breach of behavior on the part of the sailors or as a result of some longstanding enmity between the islanders and foreigners. Like the incident with WAVERLY, these attacks often resulted in the loss of the ship as well. The trading schooner DASH ran aground on the western Caroline Island of Ngulu in March 1834. While the crew was attempting to free the ship, the islanders attacked, killing three men and wounding the captain. Captain Keating organized an escape of the remainder of the crew on the ship's boats, eventually making it to Manila (Ward 1967(5):152).

In 1846 the brig WILLIAM NEILSON, on a trading mission in the region, was attacked while at Ebon in the southern Marshall Islands. The crew were killed and the ship destroyed by the islanders. The year before, it was reported that Captain Cheyne, on the ship NAID, also had trouble with the natives of Ebon who killed one man (Ward 1967(4):324-326, 333-334).

In 1852, the schooner GLENCOE was also attacked and burned at Ebon (Ward 1967(2):255, (4):327). That same year, SEA NYMPH, on a trading voyage out of San Francisco, was attacked and burned at Jaluit (Ward 1967(4):327).

The Gilbert Islands were no more safe for the independent trader. In 1851, the brig RODOLPH was attacked and the ship destroyed by the inhabitants of Tabiteuea (Ward 1967(6):541). Two years later the trader ROSA was attacked at Tarawa.

... the brig Rosa, while on a trading voyage among the South Pacific Islands, was attacked at Tauroa [sic] by savages, and the Captain and several of the crew murdered. The natives, of who a large number had been admitted on board the vessel, commenced a simultaneous attack upon the crew of the brig, killing or overpowering six of their number and forcing the survivors to seek refuge in the cabin. They there procured arms and ammunition ... and after a sharp conflict, succeeded in overpowering the natives--driving most of them overboard. ... Mr. Maiden, the second mate, upon whom the command devolved, bore the vessel up for Sydney, where she arrived in safety (Daily Evening Traveler, Boston, November 23, 1853 in Ward 1967(7):223).

Increased trading in the region also increased the number of vessel losses from navigational errors, natural disasters, or on-board conflicts. In 1810 the British trading ship MARTHA was sunk after running aground on Palau's southernmost atoll, Helen's Reef (Ward 1967(3):197). The London-based ISABELLA, while on a passage from Sydney to Manila, wrecked in 1811 at Oroluk Atoll near Ponape. The British-owned East India Company ship CANTON ran aground on Taongi in the Marshall Islands in 1832 (Ward 1967(7):222), and in 1844 the schooner SHAW wrecked on a reef at Ponape (Ward 1967(6):145). The survivors of these wrecks, while under a good deal of stress, were not necessarily mistreated by the natives. The American bark SARAH MOOERS, en route from Sydney to San Francisco, wrecked on the reef at Ngatik in the eastern Caroline Islands on December 2, 1853. Contemporary newspapers provide the following account of the disaster.

The British ship Sea King arrived at Hong Kong on the 2nd May, bringing from the Raven Islands in the ... Pacific,

eighteen passengers and the carpenter of the wrecked ... Sarah Moore, of San Francisco.

The Sarah Moore sailed from Sydney for San Francisco on the 4th of September last, having on board, besides the crew eight cabin and twenty-two steerage passengers. ...The vessel sailed for two or three weeks in the direction of the Friendly Islands, where the Captain proposed trading....

On the 4th December, the ship hove to off Nottick [sic], one of the Raven Islands whence the boat was sent ashore for hogs and the master gave charge of the deck to a European from the Island, who professed to be a pilot. Suspicions were aroused by the conduct of this man, who permitted the vessel to drift on the rocks at high water. The value of the cargo was \$2000. There were but five or six natives on the island who treated the passengers well.

On the 17th of March, the American whalers Delta and Thomas hove in sight, and sent boats ashore, taking off the captain, cabin ladies, and crew. ... Before this, two of the crew, three passengers and a native started in a ship's boat for the island of Ascension [Ponape], but never after heard of and are supposed to have perished. Among those left on Nottick, were Mr. and Mrs. Power, and two children, who endured great privation until the 20th April, when they, with the others remaining, were rescued by the Sea King (The Friend, September 1854 in Ward 1967(5):150-151).

Finally, the British-owned East India Company bark LADY RAGLAN, while on a trading voyage from London to China, wrecked on Helen's Reef in 1854 (Hazel 1979:8-9).

Whalers

Although the Spanish had a profound effect on the people of the Mariana Islands, and the early independent traders made their presence known throughout Micronesia, it may be safely

said that the American whalers presented the greatest impact on the precolonial Caroline, Marshall and Gilbert islands.

Whaling expanded from the Atlantic into the Pacific just before the turn of the nineteenth century. From 1793 to 1820, British whalers were among the first to scout the mid-Pacific in search of whales. The first American whaleship entered the Pacific Ocean while looking for whales off New Zealand in 1804. Until 1815, Pacific whaling was concentrated along the west coast of South America, referred to as the "onshore grounds." After 1818, the "offshore grounds," 1,000 miles off the coast of Peru, became the favored hunting area. By then, however, the whaleships were ranging as far north as San Francisco Bay, and by 1823 American whalers had visited Honolulu and more than 60 were cruising off the "Japan grounds," that large open area between Hawaii and Japan (Bertrand 1967:261-262).

Once initiated, whaling increased rapidly in the Pacific; 119 American whaleships were reported hunting there in 1819, and by 1840 that number had increased to more than 500 (Bertrand 1967:262). The ship captains quickly learned to follow the migrations of the whales; in the spring they would hunt off Japan, the summer would be spent in the Arctic, and during the winter they cruised the equatorial grounds. It was during these winter cruises that the whalers visited the islands of eastern Micronesia.

Among the first islands to be visited on a regular basis were the Gilberts. Nonouti was visited by the British whaleship ANN AND HOPE in 1799; however, it was Tamana, first visited in 1804, and Nikunau and Arorae, each first visited in 1825, that received the vast majority of whalers in that island group. Captains of whaling ships also made some discoveries in the island group. Capt. J. Clerk, on the whaler JOHN PALMER, was the first to sight Beru, which he named Maria's Island; Onotoa, which he named Eliza Island; and Tamana, which he named Rotcher Island in 1826.

The first visits by whalers throughout eastern Micronesia followed a general pattern of east to west and south to north (refer to Figure 4.14). The Gilbert Islands received the majority of their first visits between 1804 and 1827, and the southernmost Marshall Islands of Namorik and Ebon were first visited in 1835 and 1837, respectively. The far eastern Caroline Islands of Ponape, Ngetik, Mwokil and Kosrae were first visited between 1833 and 1842, while the southernmost of the eastern Carolines, Kapingamarangi, was first visited in 1828 (Langdon 1979:31-33, 52-61, 106-107).

Without a doubt, however, the 1840s and 1850s were the period of heaviest visitation by whalers throughout Micronesia.

Wilkes (1845(5):484) described the American whaling industry as "... whiten[ing] the Pacific Ocean with its canvas."

Ponape, at which about fifty ships had called during the whole decade between 1830 and 1840, received thirty or forty ships each year during the early 1850s and more than fifty in its peak seasons of 1855 and 1856. Kosrae, which never became quite as popular as Ponape, was visited by twenty or thirty ships a season during the early 1850s ..." (Hezel 1983:132).

The whaleships were designed and equipped to not only hunt and take whales but also to process them. Because the whale oil and bone or baleen could be stored without spoilage and later off-loaded in Honolulu for shipment to the East, whaling voyages often lasted four to five years. It was necessary, therefore, for the whalers to be able to obtain wood, water and food from the Pacific Islands they visited. Islands that could provide a liberal supply of these much-needed items were visited by a steadily increasing number of ships. By the early 1840s, it was reported that "the people generally, except the aged members of the community, have obtained a very extensive knowledge of the English language, enough to make themselves pretty well understood" (Baker in Ward 1967(3):575).

The whalers brought with them small items for trade, including prized red calico shirts, gingham blouses, tight-waisted dresses, palm-leaved bonnets, and printed handkerchiefs. More importantly, however, the whalers brought to the islanders western culture and a knowledge of other places and things. Not infrequently the sailors would desert ship to live, for a while, among the islanders. Former deserters, or those stranded on the island for one reason or another, often worked for island chiefs and acted as trade intermediaries.

Unfortunately, whalers also brought western diseases. Smallpox was brought to the island of Ponape in 1854 by the whaleship DELTA. The dead sailor was buried on the island and two additional crewmen, also infected, were left behind. Before the disease ran its course, more than 2000 Ponapeans --over a third of the population at that time--were dead. In 1855, influenza swept through Kosrae and killed several hundred. Between 1830 and the end of the whaling period in the 1860s, the population on Kosrae went from over 2,000 to less than 700 (Hezel 1983:139-140). Venereal disease including syphilis was rampant on Ponape and Kosrae and, as

one might expect, this situation was little different on the other islands habitually visited by the whalers.

Despite generally good relations between the whalers and islanders, there were a number of incidents of violence between the two groups. In the early whaling era, the British ship NIMROD was attacked in November 1833 at Macaskill Island (Pingelap) by natives; the captain and one crewman were killed. The American whaler MENTOR ran aground on a northerly reef of the Palau Islands in 1832.

... The ship ran on the rocks of the Pellew Islands, on the night of the 21st of May 1832 and the crew were saved by taking to the boats. ... At daylight, discovering part of the reef dry, they directed their course to it, where they passed that day and the following night. The next morning they were visited by a number of canoes full of natives of a neighboring island, for the purpose of plunder. The crew were finally robbed of their clothing and left almost naked. (Boston Daily Atlas August 10, 1833 in Ward 1967(5):410).

Within a few days the crewmen reached Babelthuap, the largest of the Palau islands, where they were treated fairly by the natives. After spending some months on the island, several of the stranded crewmen left in a whaleboat and a canoe in an effort to reach the Celebes. Blown off course and short of water, the eight men and three natives who accompanied them landed on the island of Tobi. While on Tobi, the crewmen and natives were treated as slaves and nearly half the group died or were brutally killed there. Horace Holden, a survivor, wrote a widely circulated account of the loss of MENTOR and the subsequent rescue of the remainder of the crew (Holden 1836).

In November 1834, the English whaleship CORSAIR left Oahu and headed for the Kingsmill Islands (Gilberts) in search of whales. After spending three weeks and obtaining 390 barrels of sperm oil, they headed toward Drummond Island (Tabiteuea). A contemporary newspaper provided the following account of subsequent events:

On the 13th of January 13 {1835}, being in the leeward of Drummond's Island, at 9 p.m. Capt. Venables thought he saw lights ashore, or ordered the ship's helm to be put down; the man at the helm put it hard up, and the ship immediately struck an

unseen reef. Everything was done to get the ship off, but in vain. The same night a boat containing Mr. Smith, the surgeon, and five men, was lost. The other four boats were loaded through the cabin windows with the most valuable articles. At daylight saw the land about 8 miles to the northward. [The captain] sent two boats to reconnoitre, which came back at noon, saying there was a sand bank in the bay, on which a vessel might be built, that the natives appeared friendly, and that they thought no danger was to be apprehended from them. ...In the morning two boats went to procure goods from the ship; one boat's crew guarding those on shore.

The Captain's boat had touched at another point on the Island. About 250 natives came from the main island and stated that the captain and six men with him were slain by the natives. They then attacked the guard, three of who were wounded, killing in return three natives. Both parties then fled, the natives bearing off goods. About two hours after the arrival of the men at the [stranded] ship a great number of canoes were on their way to the ships, and it was decided to set the ship on fire, which was done, after obtaining bread, water and clothing. The three [ship's]boats, with eighteen men, then started for Guam. After much suffering they arrived at the island of Rota, Feb. 11, having been 27 days in the boats (Essex Register, March 3, 1836 in Ward 1967(6)536-7).

In 1836 the British whaleship FALCON was forced to spend nearly three months at Kosrae because of adverse winds. Finally, in April, Capt. C. Hingston weighed anchor and depart for Ponape. After they arrived at Ponape, once again strong winds prevented their departure, This ship was still stranded in July, when it finally went onto the reef. While the ship was disabled, natives on the island attacked, killing the captain, mate and four of the crew (Hazel 1979:41, 90). That same year the American whaler AWASHONKS was attacked in 1836 at Namorik in the Marshall Islands. In this incident only the captain and first and second officers were killed and the crew returned to Hawaii safely (Ward 1967(5):5).

In the eastern Caroline Islands, Kosrae was not only the scene of attacks on trading ships but on whalers as well. In September 1842, the crew of the British whaleship HARRIET were attacked. After killing the crew, the Kosraeans burned and scuttled the ship in an act of revenge for wrongdoing to island women (Hazel 1983:115-116, Ward 1967(3)564-566).

Many whaling ships were lost in the region simply as a result of running aground and not as the result of any violence from the natives. In 1844 the whaler COLUMBIA, under the command of Captain Kelly, wrecked on Sydenham Island (Nanouti) in the Gilberts (Ward 1967(4):419). Eight years later, another whaler was lost in the Gilberts; the whaleship ONTARIO ran aground on a reef at Pitts Island (Butaritari) in 1852. The ship struck at 4 a.m. on January 24 and within a few hours was a wreck. The captain, crew and a portion of the cargo were rescued by the schooner SUPPLY (Ward 1967(2):45). That same year, GENII was abandoned at Kosrae in the eastern Caroline Islands. The chief of the island, known as King George, would not allow the crew to remain on the island and forced them to depart in canoes or boats for Ascension Island (Ponape) (Ward 1967(4):362).

The whaler PARAGON was being towed out of the harbor at Strong Island (Kosrae) on March 20, 1853, when it drifted on to the south reef and wrecked (Ward 1967(3):589). Six years later the whaler LEXINGTON had similar troubles. Captain Fisher of the stricken ship wrote of the loss.

We put into Strong's Island on the 5th of March [1853], for recruits, before going North. A few days after we anchored there, the wind came in to the eastward, blowing straight into the passage, and we did not get a chance to get out until the morning of the first of April when we got under weigh, with a fair wind from the westward. Took the pilot on board, and had two of the King's boats and four of the ship's boats, towing the ship. When we got about the middle of the passage, a strong breeze from the eastward, with a heavy sell, sprang up and took everything aback, two anchors were let go and all sail clewed up as quickly as possible, but by the time the anchors brought up, her stern struck the reef. The swell and breakers continued to increase, as the tide rose, and it was impossible to get alongside with the boats; two of them got broken to pieces.... By the exertions of

the missionary, Mr. Snow, one of the natives was persuaded to swim through the surf with a line to the ship, by which [the captain] and the crew that remained [on board] were hauled on shore. In a short time she struck, a great part of her keel came out, and everything that was in the cabin and the run was washed off (Fisher in Ward 1967(3):603-604).

The Rev. S.C. Damon wrote to the Honolulu-based newspaper, The Friend, with an account of the loss of the whaleship MIANTONOMI at Ponape in November 1854.

The first whaler in was the Miantonomi, Capt. Clement, in the last part of September. The small pox, which had been raging here and taken off about half the natives, broke out among her crew after she sailed. She in consequence returned, and on the 20th of November was wrecked on the outer reef, between the Bonatik and Paniau harbors ... (The Friend, Nov. 14, 1855 in Ward 1967(6):179).

The whaling era declined rapidly after the late 1850s and by 1869 only three ships landed at Xosrae during the season, Ponape had only a few more, and the most popular stopovers in the Gilberts, Tamana and Nikunau, reported only one ship each (Langdon 1979:32,36,57,60). However, the event that foreshadowed the end of whaling in Micronesia was not an attack by natives or the loss of a ship on a remote reef; it was the attack by a Confederate cruiser on Yankee whalers in the Pacific.

The cruiser SHENANDOAH, captained by James Waddell, was mandated to devastate the Union's whaling fleet in the Pacific; toward this end Waddell boarded a Hawaiian schooner on March 30, 1865, to "inquire of the captain ... the location of [the Yankee] whaling fleet, and ... immediately steered a course in that direction" (Boston Evenina Courier Aug 26, 1865 in Ward 1967(6):193). SHENANDOAH then surprised the whalers HECTOR, EDWARD CAREY, HARVEST and PEARL in Ponatik Harbor at Ponape. Waddell demanded the surrender of the ships that were trapped in the harbor and claimed them as prizes of war. The ships were stripped of useful gear and whale oil and were burned at anchor. The crews, with the exception of those who joined Waddell, were left at Ponape. The Boston Evenina Courier chronicled the events that followed:

The Shenandoah then set sail for Ochotsk Sea, where on the 27th of May she captured the whaling ship Abigail, Capt. Nye, with 30 bbls. of sperm oil. After remaining alongside the Abigail one day, and taking from her such clothing, small arms and liquors as were wanted, she was committed to flames, and with the Abigail's crew on board, the pirates set sail for the Arctic Ocean. Soon after the crew of the Abigail went on board Shenandoah, T.S. Manning, who had been [Abigail's] second officer, John A. Dowden, boatsteere, and thirteen men, mostly Sandwich Islanders, joined the pirates [Manning] joined the Shenandoah as pilot, and steered the pirate towards our whaling fleet, and gave the rebel commander the ... information as to where it lay. The Shenandoah arrived off Cape Thaddeus at the entrance to the Arctic Ocean, on the 20th of June. Here she encountered the Euphrates, Capt. Hathaway, with two whales, which was burnt on the 21st June. The next day, she fell in with, and burnt the Wm. Thompson, Capt Tucker, and the Jireh Swift, Capt. Williams, having four whales each (Ward 1967(6):193-194).

Before Waddell was finished, he had used SHENANDOAH to capture and burn 34 whaling ships and capture and bond 4 more (Starbuck 1878:103). This proved to have a serious impact on the already depleted whaling fleet. At the beginning of the Civil War, the United States government had purchased and scuttled more than 40 old whaleships at the mouths of the Charleston and Savannah harbors in an effort to block those ports (Starbuck 1878:101).

A final blow occurred in the fall of 1871, when the Arctic whaling fleet, consisting of 34 ships, was destroyed by ice off Point Belcher. The ships, having worked their way well into the Arctic, were trapped when a southwest wind drove pack ice inshore, immediately catching several ships and quickly packing small ice around the remainder.

The heavy floe-ice grounded in shoal-water and between it and shore lay the ships, with scarcely room to swing at their anchors.... Nothing but ice was visible offshore ... the only clear water

being where they lay, and (that narrowed to a strip from 200 yards to half a mile in width, and extending from Point Belcher to two or three miles south of Wainwright inlet.... every day the ice packed more and more closely around the doomed vessels.

... The next day the bark Awashonks [was crushed].... The peril was now apparent to all ... the little clear water that remained was rapidly filling with ice and closing around them (Starbuck 1878:105-106).

On September 14, 1871, the fleet was abandoned. The loss of the Arctic fleet, when coupled with the devastation wreaked by SHENANDOAH in the Pacific in 1865 and the introduction of kerosene in the early 1860s, brought the whaling era quickly to a close.

Missionaries

When whaling was at its peak in the late 1840s and 1850s, two other activities were making their influences felt in the region: the missionaries and the copra traders.

American missionary activity in the Pacific began in the Hawaiian Islands in the 1820s when the Boston-based American Board of Commissioners for Foreign Missions established its first mission. As a result of its success in Hawaii, by the 1850s the board was ready to begin establishing missions in Micronesia. The first mission established was at Kosrae. Three American couples and two Hawaiian deacons with their wives arrived on the island in August 1852 and requested permission to stay. The high chief of the island, known as King George, gave Benjamin Snow and one of the Hawaiian couples permission to set up a mission. The remainder of the group travelled to Ponape in hopes of establishing a mission there.

On Ponape the missionaries were given permission to set up a station in the area of Kiti Harbor. The nahnken of Kiti, a young influential leader on the island, welcomed the missionaries and provided them with a piece of land for their use. Albert Sturges, Luther Gulick, and the Hawaiian deacon Ka'aikaula, quickly settled in at Rohnkiti. A short time later, Gulick obtained permission to set up a second mission on Ponape in Madolenihmw, overlooking the main harbor.

Despite the smallpox epidemic that swept through Ponape in 1854, the intertribal warfare between chiefs vying for the

support of followers, and the tremendous decline in the population that both of these events brought about, the missions continued. During the worst of the epidemic and shortly thereafter, Sturges and Gulick even considered abandoning the Ponape mission and moving to either the Gilberts or Marshalls. However, the missionaries persisted and mission schools were set up and church services were given to ever-increasing numbers of islanders. Although the missionaries felt that it was just a matter of time before the population of Ponape and its outliers died out, they did not hesitate to hold services whenever they found an audience, and in fact found that the islanders on Pingelap, Ngatik and Mokil were eager to have missions established.

Surprisingly, the teachings of the missionaries on Ponape were not openly opposed, and their attack on prostitution, alcohol, the "heathen" custom of feasting and the belief in spirits did not excite much resistance. The islanders' belief in spirits, the basis of their traditional religion, was already declining as a result of the many outside influences converging on the small island. It was the missionaries' opposition to kava and all of the rituals associated with its use that eventually separated the converted Christian from the heathen and posed the most difficult problems.

To hold a feast of any sort without the ritual kava drinking was unthinkable. Any Ponapean man worthy of the name was expected to grow the plant, indeed the cultivation of kava was an important avenue for achieving prestige in the society.

When the missionaries singled out kava drinking as a special object of reproach, they did so not simply because of the drug's association with the evils of alcohol, but because it, more than anything else, symbolized an adherence to the old heathen ways (Hezel 1983:153).

The missionaries' influence on Ponape was apparent and growing by the late 1850s. With the availability of iron tools, clothing, muskets and other western items, women were beginning to wear dresses and men wanted cash payments for their work instead of tobacco or trade items; in short, the islands' inhabitants were becoming more sophisticated. The religious hymns taught to the islanders were being sung even by those who did not attend church services, and missionary teachings were being passed by word of mouth (Hezel 1983:155). Although there was a resurgence of the traditional religion and some confrontations occurred between

the Christians and "heathens" in the early 1860s, in 1866 Christians numbered more than 3,000 on the island, and by the end of 1867, the missionaries stated they "...have reached what may be called the second stage of our work, the great mass of the people have abandoned heathenism" (Sturges in Hezel 1983:158).

The mission on Kosrae, although supported by King George and generally successful, met with much more resistance among the population. After the King's death in 1854, the attendance at services dropped dramatically and there were those who wanted the missionary, Benjamin Snow, expelled from the island. Kanka, George's successor, neither fully supported nor openly hindered the missionary's work. It was not until Snow began preaching on Ualang, the main island, that Kanka was opposed. The traditional religion was strong there, and the island priests warned the people that they would be in deep danger if they listened to the missionary. A fishing accident to one of Snow's disciples was offered as proof of the danger of listening to the missionary; as a result, attendance at services dropped to nearly nothing. Snow was forced to limit his preaching to the small island of Lelu (Hezel 1983:158-164).

In 1855 and 1856, influenza ripped through the island and took hundreds of lives. In an effort to restore the old order, the chiefs reinstated the traditional religious teachings, much to the dismay of Snow, and in 1857 all foreigners, with the exception of the missionary and his family, were expelled from the island. It was not until 1858 that any real progress was made toward Christianization of the islanders. That year a Kosraean convert went back to Ualang to preach; his surprising success renewed Snow's hope for the establishment of a permanent mission. By 1862 when Snow left to establish a mission on Ebon in the Marshall Islands, the church had a following of nearly 200 and the demise of the chiefly class was imminent (Hezel 1983:164-167).

Despite the reputation that the Marshallese had for violence against foreigners, mission activities were initiated in the islands in 1857 with the arrival of Edward and Sarah Doane. Their way was paved in 1855 by another missionary, Dr. George Pierson, newly assigned to Kosrae. While en route to his assignment, Pierson traveled on board a whaler that stopped in the Marshall Islands. By coincidence, the ship visited Ailinglapalap where the most influential and most feared chief in the Marshalls was collecting tribute and visiting. For some reason Kaibuke, the chief, was receptive to the missionary and sent Pierson to Ebon as a preliminary step to the establishment of the mission. Two years later, when the Doanes and Pierson returned to Ebon on the missionary packet

MORNING STAR, they brought with them Hiram Bingham and a Hawaiian teacher, Kanoa, who would travel on to establish a mission on Abaiang in the Gilberts.

Because of the patronage of Kaibuke, the mission on Ebon flourished. From the very beginning, over 100 islanders attended church services, and when chiefs from neighboring islands visited with their retinues, they too attended en masse. Fortunately for the missionaries, the island's population was not a stable one. As a result of the constant interisland travel, the Marshallese spread the mission's teachings throughout the archipelago. "Word of the sermons goes out from the missionaries to their immediate neighbors, and via them to others of the north" (Pierson in Hezel 1983:203).

The missionaries did not have kava or alcohol problems to contend with when they arrived and tobacco was not widely used. There was "... no rowdyism, no fighting, and no opposition from whites biased against the missionaries" (American Board of Commissioners for Foreign Missions (ABCFM) Dn-A 23 Mar 1859) and the Marshallese feasts were not represented by "...gluttonous eating, drinking to intoxication and wild revelry" (Doane, ABCFM DN-A 23 Mar 1859) that occurred on other islands. As a result of the missionaries proscription against tattooing, it was no longer openly practiced on Ebon, and by 1860 the majority of the islanders would not work on the Sabbath. Mission success in the Marshalls was linked to the success in the schools. Within a few years several schools were opened on other islands, and by 1869 Marshallese, educated at the mission school, were themselves teaching and spreading the Gospel (Hezel 1983:202-209).

It is not surprising that as the missionaries' influence increased among the islanders, the Marshallese chiefs became less enthusiastic about their presence and their teachings.

Although the chiefs outwardly maintained their polite and deferential posture toward the missionaries for a while, the chill deepend year by year. With the death of Kaibuke ... who had acted as a check on lesser chiefs to keep opposition within bounds, their hostility became more open. The chiefs soon dropped any pretense of attending religious services ... and began terrorizing the Christian neophytes among their subjects (Hezel 1983:208).

In spite of the open animosity of the chiefs, the mission grew quickly during the 1860s. By 1865 Hawaiian teachers were on Namorik and Jaluit in the Ralik chain, and in 1869 Mili and Majuro in the Ratak chain had missions established. Shortly thereafter, missions were established on Arno and Maloelap, and by 1875 seven islands had missions (Hazel 1983:209).

The packet MORNING STAR I was purchased by the American Board of Commissioners for Foreign Missions in 1856. The ship was used to support the various missions and transport passengers and cargo throughout the region. Not only did the packet bring missionaries, it also brought those who would just observe and report. In 1861, the editor of the Honolulu-based newspaper, The Friend, travelled on MORNING STAR to provide "... our readers with a series of descriptive sketches ..." about the islands and its people, among them the still relatively little-known Gilbert Islands (Ward 1967(4):397).

The mission on Abaiang was flourishing in 1861, and it was reported that the missionaries had made a good beginning in the region. Portions of the New Testament, hymns, and textbooks had been printed in the native language and a school established. The chief of the Abaiang regularly attended the church services and participated in prayer meetings (Ward 1967(4):409-411). On Tarawa, similar successes were achieved; the chief took the missionary families under his protection and encouraged attendance at sermons. A school was established on Tarawa that could boast its "... pupils could answer questions equal to the advanced classes in the very best Sabbath Schools of Christian lands" (Ward 1967(4):410).

At the beginning of the 1860s, the total population of the Gilbert Islands was estimated to be 50,500. Trade was limited to coconut oil in exchange for tobacco and arms. With the arrival of the missionaries, the islanders began requesting cloth, knives, hatchets and other articles. The chief of Abaiang even purchased lumber for the construction of *a* small house (Ward 1967(4):417-418). This was a dramatic difference in the Gilbertese acculturation as Dr. Gulick described the islanders as little changed from their traditional way of life when the missionaries first arrived in 1857.

Although generally the missionaries had little to fear from the natives, and no attacks on their ships are reported, the missionary service was not without its mishaps. After the final voyage of MORNING STAR I to Micronesia in 1861 (Ward 1967(4):397), the packet was replaced by a second ship, MORNING STAR II. The second MORNING STAR continued the

support of the missions in Micronesia until October 1869 when it wrecked on an offshore reef at Kosrae. Captain Tengstrom reported the following regarding the disaster.

The brig Morning Star left the south harbor of Strong's Island [Kosrae], for Honolulu, at 3:30 on the 18th of October, with a light wind offshore. Were towed out with two of the brig's boats and the pilot boat. At 5 P.M., the pilot and all shore hands left the vessel, and one of the brig's boats was sent to get some lines which had been left on the reef. At 6:15 the boat returned and was taken on board the brig, which was at this time fully three miles from shore, with wind very light, N. by W. During the evening, which was cloudy and dark, it was found that the brig had drifted in shore with a strong current, the boats at once manned and sent ahead to tow her off; but still the vessel kept drifting in. Finding that nothing could be done to keep her off shore, the port anchor was let go at 8:32 P.M. in twenty-five fathoms of water. At 10 P.M., a squall came up ... the eastward which appeared very threatening, but gave us hope that by slipping the anchor, we might get out to sea before the force of the squall struck the vessel. Everything was made ready for this emergency, as the squall struck us, the fore and aft sails were hoisted, the chain slipped and for a moment the vessel went ahead; but the heavy rollers which came in checked her headway, and before she could gather again, she struck a little aft of the mainmast, the next sea lifting her broadside on to the rocks.... At 11 P.M. the passengers were sent ashore in one of the boats, at great peril. At 11:30 the foremast was cut away. A heavy wave which had broken over the vessel made a complete wreck of everything on deck and in the cabin-staterooms, doors and furniture being completely smashed by its force, and all the clothing, stores, etc., scattered and destroyed. At 1:30 the boat returned from the harbor, three miles distant. At every sea washing entirely over the vessel, nothing could

be done further to save her or the effects; and at 2 A.M., the officers and crew went on shore. They returned at daylight, but found everything so completely destroyed by the breakers, that nothing could be saved (Tengstrom quoted in The Pacific Commercial Advertiser, Feb. 5, 1870 in Ward 1967(3):613-615).

MORNING STAR II was replaced by MORNING STAR III, which served the missionaries without serious mishap until 1884, when it too wrecked at Kosrae. Capt. George Garland arrived at the island initially on November 13 to take off the officers and crew of STAGHOUND, which had wrecked in August. The ship then visited Ponape and Truk and on its return to Kosrae in February 1884 went aground as it was entering the harbor (ABCFM 1852-1909:IX; Garland to Prudential Committee, 20 Mar 1884; Hezel 1979:110).

Copra and Labor Traders

During the first half of the 1800s, general trade continued throughout the region. However, not long after the arrival of the first missionaries on Ebon in 1857, a different type of trade began and a different type of trader entered the islands. These were the copra agents and traders who established permanent stations on the islands and settled in the region. Eight trading ships visited Ebon in 1860, and in 1861 the first coconut oil factory was established. With the copra traders came both prostitution and disease. Influenza swept through the island in February 1859, and measles and influenza struck in 1861. In 1863, a virulent form of typhoid further reduced the population. Venereal disease including syphilis spread rapidly through the Marshalls and Gilberts as the trading ships began more extensive visits throughout those archipelagos.

The first copra station in the region was on Ebon. The trading schooner PFEIL, owned by the German firm of Hoffschlaeger and Stapenhorst, landed the first two traders in early 1859. PFEIL traveled throughout the islands in support of the copra trade and in 1861 brought all the materials to set up a small coconut oil extraction plant, the first in the region. Although the coconut had been used extensively throughout the Pacific by the islanders for cooking and as an ointment, it was not until 1840 that Westerners first recognized its commercial potential in the manufacture of candles and soaps.

One of the largest of the trading firms, and one that quickly spread throughout the Pacific, was J. C. Godeffroy & Sohn.

The German-owned company set up an agency in Samoa in 1857 and established its commercial predominance in central Polynesia within a few years. Godeffroy's influence expanded even more rapidly after it perfected a more efficient method of collecting the oil than pressing and shipping it in casks; the coconuts were split, dried and transported in sacks. The dried coconut meat produced a purer oil and the "chaff" could be used for cattle feed (Firth **1977:5**). Not only was it more efficient, it was also cheaper to transport. In 1869 Godeffroy's agents were sprinkled throughout the Gilbert Islands, and by 1873 there were five stations in the Marshalls. After 1876 Godeffroy stations were located from Tahiti to the Marianas, including the Carolines. A fleet of eight large trading ships supported the company's stations, visiting once or twice a year to collect the copra, turtle shell, and beche-de-mer and leaving supplies (Firth **1977:5**).

Godeffroy & Sohn was joined by other German firms. Fred Hennings and Ruge, Hedemann & Company both set up business in Fiji in 1863. Adolph Capelle & Company set up a station on Ebon in 1859 and eventually became Godeffroy's agents. In 1874, Eduard and Franz HERNSHEIM established stations on Malakal in Palau and in 1876 in the Marshall Islands. By 1879 the HERNSHEIM trading interests were firmly established throughout the Marshall and Gilbert islands and their business headquarters were on Jaluit (Firth **1977:5-6**). The Germans were joined in Micronesia by Crawford & Company of Honolulu and Henderson and & McFarlane of Auckland (Hezel **1873:212**).

Competition was brisk between the trading firms and, as a result of several financial setbacks, by December 1879, Godeffroy & Sohn was on the verge of bankruptcy. Unable to maintain its hold on the market, the company sold its interests to the large German firm of Deutsche Handels und Plantagen-Gesellschaft der Sudesse Inseln zu Hamburg (DHPG). Along with HERNSHEIM & Company the DHPG dominated the copra trade until the German annexation of the Marshalls in 1885.

By the end of the 1870s the Marshallese, Gilbertese, and Caroline Islanders had become accustomed to ship's biscuit, beer and Schnaps, as well as the usual cotton and iron goods. Some Marshallese chiefs dressed their wives in silk, mostly bought on credit from the trader, and supplied them with sewing machines, while at Yap in the Carolines, a chief paid M4,000 for an old machine-gun of the Bavarian army (Firth **1977:6**).

The copra trading houses not only changed the traditional processing of copra, they also changed the manner in which it was produced. All things being favorable, coconut plantations were more profitable than independent collectors. Plantations were established throughout the region after 1876, which provided the European grower with final say about the production and price of the processed coconuts. This also ensured a greater profit for the trader. Despite price fluctuations and changes in trading firms, copra continues to this day to be an important agricultural product in the Caroline, Marshall and Gilbert islands.

Not surprisingly, the increased general trade and copra production within the islands resulted in a number of shipping losses and accidents related to that activity. The schooner FLYING FOX wrecked at Sydenham Island (Nonouti) in the Gilberts in 1848 (Ward 1967(4):419). In 1865 or 1866 EBBA BRAHE, "a full-rigged ship bound for China," wrecked on a reef at Ngulu in the western Caroline Islands (Tetens 1958:64). In 1859 the Belgian ship CONSTANCE wrecked on "...an unknown reef in the Caroline Islands on the 9th of July" (Ward 1967(2):93). That same year the Hoffschlaeger & Stapenhorst-owned schooner PFEIL ran aground in the lagoon at Ebon.

In entering the passage leading to the lagoon, and the wind suddenly shifting, the schooner struck midway on the rocks, where she remained one and a half hours, striking heavily several times. With great exertion of the crew and with the help of the natives from ashore, the schooner was got off and anchored to the leeward of the island.... [after arriving at Guam] a survey having been held ... the schooner was condemned and sold (Ward 1967(2):244).

In 1861, the trading ship NORNA wrecked on Oroluk in the eastern Carolines. When the captain and crew reached Guam, he also reported that two other vessels were wrecked in the same vicinity (Ward 1967(5):343). After trading and collecting copra throughout the region, the German schooner MARIA, owned by Hoffschlaeger and Stapenhorst, wrecked on a reef at Ebon on February 4, 1863 (Blodgett in Ward 1967(4):338; Hezel 1979:124). Elsewhere in the Marshall Islands, the German trading schooner FRANZ out of Hamburg was attacked and destroyed at Rongrik. The natives murdered the shore party, took the vessel, killed the rest of the crew and burned the ship. Finally, in 1863 the trader CLARA D.

ROBBINS wrecked on Majuro; on board was the well-known copra agent Adolph Capelle (Hezel 1979:125).

The British-owned bark SYRINGA, bound to China, lost its fore and main topmasts during a squall when just north of the Gilberts. SYRINGA eventually arrived at Jaluit where

... the carpenter commenced cutting out and fitting new topmasts; but before this had been accomplished the wind had veered to the westward, and the vessel swinging to, touched with the stern on the rocks and was wrecked. Capt. Pease, of the Water Lilly, brought [sic] the wreck for \$500 taking away with him seventeen sails, two boats complete, and a large quantity of other gear ... (Pacific Commercial Advertiser, Feb. 12, 1870 in Ward 1967(3):355).

In the western Caroline Islands, the English trading bark RENOWN, under the command of Capt. G. E. Adams, wrecked at Palau on February 9, 1870. The crew remained under the care of the chief of Koror for nearly two months before they were rescued by the British warship HMS RINALDO. It was reported that the "crew was treated with the greatest possible kindness and hospitality" (Robinson 1870 in Hezel 1979:11). A few months later, after trading throughout the Marshalls, the schooner MALOLO arrived in Ponape on May 30. Capt. E. A. Pitman reprovisioned and, after taking several Chinese laborers on board to return to Shanghai, departed on July 17, 1870. As he was attempting to leave the harbor, the ship went aground on a reef (Bridges 1870).

The American ship BELVEDERE, out of Savannah on a pearl-diving cruise, wrecked on a reef near Yap in 1871 (Klingman 1950:16-17). In the Marshalls, the British bark CORYPHAEUS wrecked on a reef at Ailuk Atoll on August 23, 1871. The captain and crew were well treated and on September 3 the majority of the crew departed in two of the ship's boats. In April 1872, the remaining crewmen were rescued by the HMS BARROSA (Moore 1872; Shadwell 1873).

In 1873 the Honolulu-based bark KAMEHAMEHA V was reported wrecked at Ponape (Sturges to Pogue, Aug 2 and July 25, 1873 in Hezel 1983:879). The next year the blackbirder Bully Hayes in LEONORA, later wrecked in Kosrae, visited the abandoned KAMEHAMEHA V and salvaged what he could from the site (Goodenough 1875:1675). Ironically, KAMEHAMEHA V was the same ship that rescued the crews of the stranded whalers destroyed by the Confederate raider SHENANDOAH in 1865. Well known throughout the region, the trading ship was

commissioned by the Hawaiian Government and the owners, D. Foster & Company, were to be paid \$5,000 per head for the return of Hawaiian seaman from Ascension (Ward 1967(6):198).

In September 1874, the brig ALFRED, owned by Godeffroy & Company and under the command of Captain Ganter, arrived at Jaluit to trade and take on copra. After completing its business, the ship wrecked on the reef while trying to leave (Wawn 1874:151-5; Hezel 1979:132). The next year, 1875, the Russian-built bark JULIE REITZ, owned by Capelle Company, was driven ashore and wrecked during a typhoon while anchored at Jaluit. Two other schooners belonging to Capelle were wrecked at the same time (Colcord 1875; Hezel 1979:132). Finally, in 1880 the schooner LILLA, owned by the trader O'Keefe, wrecked at Melekeok in Palau (McGuinness 1882; Hezel 1979:24).

As commercialism in the form of plantations grew throughout the Central and South Pacific, so did the demand for labor. When Godeffroy sold its holdings in 1879, the company's copra and cotton plantations covered an area of 4,337 acres and employed 1,210 laborers, mostly Gilbertese and New Hebrideans (Firth 1977:7). A wide variety of crops was tried in the islands, but only copra, sugar, coffee, cocoa, vanilla, fruit, cotton and rubber were of any commercial success. These crops required the presence of cheap labor. It wasn't long before the plantation owners were looking to Micronesia for workers.

Because many of the island peoples were unwilling to work as wage labor, the problems of obtaining sufficient numbers of workers arose. The demand for labor in the mines of Peru, the coffee plantations of Central America, the sugar cane fields of Hawaii, and the cotton and sugar cane fields of Queensland produced the independent labor "recruiter" to fill the gap. The recruiter would visit the less frequented islands and induce or coerce islanders to sign contracts committing them to work at an island or mainland plantation. In return for their labor, the islanders were to be fed, paid, and when the contract was completed, returned home. The plantation owners paid the recruiters, or blackbirders as they were more commonly known, so much per worker delivered. The first indentured islanders were taken into Australia in 1847 by Benjamin Boyd (Oliver 1951:128); however, the labor trade did not take on massive proportions until the 1860s.

As early as 1872, Honolulu and Sydney newspapers were publishing articles about the "man-stealers of the Pacific" (The Friend, May 1872). As competition for island laborers increased, the blackbirders became even more efficient slavers.

They captured savage chiefs and their families and held them hostage until enough able-bodied followers had signed on. In a few cases they even delivered the hostages to the sharks and scattered shot at the village to make the place unhealthy for rival recruiters (Oliver 1951:127).

The blackbirders also provided muskets and ammunition to the islanders, which created a demand for arms that could be filled only by signing on as a laborer (Oliver 1951:128).

The western islands of Micronesia were the most heavily hit by blackbirders; however, the central and eastern islands were also visited. The Auckland-based schooner MIDGE, on an unsuccessful search for laborers in the Marshalls, kidnapped four or five Kosraeans, and the ship EUGENE took several Marshallese from Ailinglaplap in 1872. Numerous labor ships went to the northern Marshall Islands during this period to obtain women to be sold as mistresses for plantation overseers. Reportedly among the most beautiful in the Pacific, they "... fetch[ed] at the Fiji Islands twenty pounds a head, and are much more profitable to the slavers than the men" (Moore 1872 in Hezel 1983:237).

The brig CARL, of Melbourne, regularly raided the eastern Carolines, Marshalls and Gilberts. In January 1872, the ship took 15 men from Mili, 25 from the Gilberts, and 47 from the Mortlocks, the small group of islands south of Truk. The next year SUZANNE took another 80 Mortlockese to work on the plantations in Samoa (Hezel 1983:238). Shiploads of Micronesians and Polynesians were taken to Peru and sold to the planters and guano-deposit owners. The mortality rate among the island laborers was very high, and few of the Micronesians who were taken ever returned to their homes.

As reports of the kidnappings and atrocities spread, British and American warships were dispatched to the area in an effort to control the abuses and bring to justice the offenders. The Kidnapping Act of 1872 was enacted to control labor practices, and the British and American navies were responsible for enforcing the legislation. The British Admiralty was the strongest opponent of blackbirding; however, it was stymied by some of its own colonial and foreign service officers who contended that the islanders had signed contracts; therefore, it was not slavery. In 1870 one of the peak years of blackbirding, nearly 2,300 islanders entering Fiji were "certified" as having undertaken their labor contracts voluntarily (Oliver 1951:129).

The presence of the American and British naval squadrons did much to limit the most flagrant abuses, but they were not able to stop the labor trade. The British were limited by the Fijian home government that could not, and the Queensland government that would not, prohibit the indenture system of labor recruiting. By 1873 the worst of the blackbirding was over in the Carolines and Marshalls. However, Jaluit continued to be used as a depot for laborers recruited in the Gilberts to work on the Hawaiian plantations. In the late 1870s Marshall and Gilbert islanders were still being shipped to Hawaii. Until 1882, the Gilbert islanders were the vast majority of laborers sent to Hawaii. Large-scale immigration of Japanese laborers to Hawaii after 1882 finally ended the importation of laborers from the Gilberts (Hezel 1983:239-240).

The wreck of the schooner LEONORA at Kosrae in 1874 would appear to have been poetic justice. The ship was owned by Bully Hayes, a freewheeling trader and blackbirder known throughout Micronesia, who was often sought by both British and American naval cruisers for his unscrupulous activities (Russell 1982). Bully Hayes and LEONORA were reportedly involved in some rather unscrupulous dealings on the island of Pingelap in March of 1874. Hayes allegedly kidnapped the chief of the island and held him for ransom until the islanders brought 5,000 coconuts and one girl on board (Goodenough 1875:1675). Another blackbirder, the schooner MANA out of Honolulu, arrived at Jaluit in December 1879. Before MANA could return to Hawaii with its load of indentured slaves, it wrecked on an offshore reef (Bennett 1976:26).

By 1880, the influence of the missionaries was widespread throughout the region. Missions were sprinkled from the Carolines through the Gilberts, and the traditional way of island life was dramatically changed. The islanders had developed a high level of sophistication regarding themselves and the outside world, and their taste for Western-made goods was insatiable. The introduction of rifles, liquor and disease, and the upheaval caused by the marauding blackbirders, irrevocably altered the lives of the islanders. Traditions and the native crafts disappeared with alarming speed, and a German ethnographer noted that only the people of the northern Marshall Islands still remained free of the influence of the merchant and missionary (Hager 1886:110).

Although Western contact had adversely affected the people of the Caroline, Marshall and Gilbert islands, the British and American navies attempted to control the worst abuses. In 1880 British influence was beginning to grow in the Gilberts, while German commercial interests were

well-established and felt throughout the Marshalls and Carolines. German colonial interest in the region was growing along with their trading companies. As early as November 1878, a detachment of German marines raised their national flag over Jaluit after concluding a treaty with the chiefs of the Ralik Islands (Hezel 1983:298-299). If the winds of change were not to be deflected, then

...the remedy for the ills that Western civilization had already brought to the islands lay not in a return to an imaginary culture, pristine and pure, but in an advance toward full European rule. ...the West had inflicted evils on the islanders [and] only the West could offer release from them (Hezel 1983:298).

The changes in the Caroline, Marshall and Gilbert islands from 1800 to 1880 were so pronounced that an islander born in 1800, and somehow protected from Western influence and diseases, would likely not have recognized either his homeland or his neighbors by 1880.

The first 80 years of the nineteenth century saw successive waves of Europeans sweep through the islands, beginning with the British East India Company merchantmen, followed by the British whalers and traders just after the turn of the century, the various naval and scientific expeditions, the American whalers and missionaries, the organized German and the independent copra traders, and finally the infamous blackbirders. The presence of these diverse groups not only left traces on the islands and on the cultures they encountered, but also left traces on the reefs, lagoons and sea floor that today compose a portion of the archeological record that represents this dramatic era of change.

CHAPTER V.
COLONIALISM, WORLD WAR I AND THE INTERWAR YEARS

By Toni L. Carrell and Fr. Thomas B. McGrath, S.J.

Introduction

Tremendous changes occurred in the islands of Micronesia during the 61 years from 1880 to 1941. By 1880, Guam and the Northern Mariana Islands had already gone through their colonial era. The Caroline Islands, although claimed by Spain, were never under sovereign control and, along with the Gilbert and Marshall Islands, were effectively still autonomous. However, from the 1880s through the early 1900s colonial rule was implemented in the Caroline, Marshall and Gilbert islands under two very different masters: the Germans and the British. Just prior to the beginning of the twentieth century, the influences over and fate of the Northern Mariana Islands began to diverge from those of Guam and become more closely allied with that of the Carolines and Marshalls under German colonial administration.

During World War I, although still nominally owned by Germany, the Northern Mariana, Caroline and Marshall islands were under the direct control of the Japanese. After the war the islands, with the exception of Guam and the Gilberts, were officially shuffled between European and Eastern powers and their fates were, more than ever, linked.

The Gilbert Islands, politically separated from the Caroline and Marshall Islands just before the turn of the century, continued on their own path under British rule until the inception of World War II. On Guam, a period of relative stability under American colonial administration that is referred to as the American Naval Period began in 1899 and continued until the outbreak of World War II.

The political maneuvering resulting from the Spanish-American War in 1898 and the events of World War I, which took place half a world away, irrevocably impacted and altered the future course of the Caroline, Marshall, Northern Mariana and Gilbert islands and their inhabitants. The events of this period also began to reveal Micronesia's true strategic importance in the Pacific.

American Colonialism'

Guam

The beginning of the Spanish-American war in 1898 brought the Spanish colonial period to a close on Guam and ushered in a new colonial master, the United States Navy. Along with an end to Spanish rule in the nineteenth century, there came an end to the centuries-old galleon trade and ties with the Philippines and Mexico. Unlike the other islands of Micronesia, Guam was effectively shielded by American colonial rule from the upheavals associated with World War I and the postwar era, *so* these upheavals are not addressed separately here. American naval colonialism essentially extended from 1898 to the outbreak of World War II.

The change in colonial administration from Spain to the United States also resulted in a change in the types of ships that frequented Apra Harbor.

American Naval Period, 1898-1941--Military Cruisers, Transports and Station Ships, Trading Schooners, Passenger Steamers and Mail Ships

On February 25, 1898, Assistant Secretary of the Navy Theodore R. Roosevelt cabled Adm. George Dewey in Nagasaki and ordered the Asiatic squadron to Hong Kong. Dewey was ordered to keep the ships fully bunkered with coal and "... in the event of declaration of war on Spain, your duty will be to see that the Spanish squadron does not leave the Asiatic coast and then begin offensive operations in the Philippines" (Roosevelt in Hoyt 1981:43). By mid-April, Dewey had positioned his vessels off Hong Kong while waiting for word from Washington. War was declared on April 21, and on May 1 Dewey engaged Admiral Montojo in Manila Bay. The Spanish-American War had come to the Philippines.

This military venture into the waters of the Philippine Sea created a need for supply lines across the Pacific. The first vessels to meet that need were troop transports. The supporting transports, crossing the Pacific with men and materiel, included a stop at Guam. Military transports would

"This section on American colonialism in Guam 1898-1941, and the Northern Marianas was written by Father Thomas McGrath, S.J. An earlier version of this paper was given at the C.A.S. Research Conference, University of Guam, in April 1989.

prove to be the mainstay of transportation and commerce for Guam during nearly the next half-century.

The first transports ordered to Manila were CITY OF PEKING, AUSTRALIA, and CITY OF SYDNEY. Their first stop was Honolulu, where they joined the cruiser USS CHARLESTON. Lt. Randolph H. Miner, U.S. Navy, wrote to the Chief of the Bureau of Navigation about the transporting of troops on the Pacific. Miner noted:

... [the] first expedition to Manila, consisting of the CITY OF PEKING, the AUSTRALIA, and the CITY OF SYDNEY, which sailed from San Francisco on May 25, 1898, was partly under naval control, the CITY OF PEKING being chartered by the Navy Department and having a naval officer in command, while the other two ships had naval officers on board in an advisory capacity. Few complaints have been heard from this expedition. Being joined by the U.S.S. CHARLESTON at Honolulu, they thus became almost entirely under naval management ... (Department of the Navy 1898b:137-138).

When the transports reached Honolulu, Navy Capt. Henry Glass, commander of the USS CHARLESTON, received the following orders from Secretary of the Navy John D. Long:

Navy Department,
Washington, May 10, 1898
Commanding Officer USS CHARLESTON

Sir: Upon the receipt of this order, which is forwarded by the steamship CITY OF PEKING to you at Honolulu, you will proceed, with the CHARLESTON and CITY OF PEKING in company, to Manila, Philippine Islands.

On your way, you are hereby directed to stop at the Spanish Island of Guam. You will use such forces as may be necessary to capture the port of Guam, making prisoners of the governor and other officials and any armed force that may be there. you will also destroy any fortifications on said island and any Spanish Naval vessels that may be there, or in the immediate vicinity. These operations at the Island of Guam should

be very brief, and should not occupy more than one or two days. Should you find any coal at the Island of Guam, you will make such use of it as you consider desirable. It is left to your discretion whether or not you destroy it.

From the Island of Guam, proceed to Manila and report to Rear Admiral Dewey, U.S.N., for duty in the squadron under his command (Department of the Navy 1981a:151).

The small flotilla sailed into Apra Harbor on June 20, 1898, and, to the consternation of the Spanish governor, Captain Glass quickly occupied Guam and received the surrender of the island at 2:45 p.m. (Department of the Navy 1898c:2). There was little or no resistance mounted by the small Spanish garrison who were not even aware war had been declared. The officers and men of the American ships participated in a flag-raising ceremony and a 21-gun salute from CHARLESTON on June 21, at Fort Santa Cruz (Department of the Navy 1898c:2). Later, the Spanish governor and some of his officers were taken aboard CHARLESTON as prisoners of war (Harman 1898). Army Brig. Gen. Thomas A. Anderson later wrote about the capture of the Spanish governor and his officers:

Cavete, Manila Bay
July 1st, 1898

General H.C. Corbin,
W.D., Washington, D.C.

My dear General,

I arrived here last evening after 36 days voyage from San Francisco. We were delayed seven days by orders from the Navy Department to stop en route and capture the Island of Guam. This was a sealed order to the senior naval officer at Honolulu. I knew nothing of it. The naval people made the capture, but they called on us for help, and also to ration and hold six Spanish officers and 54 men ... (Adjutant General's Office 1890-1917, no. 144687).

The day following the flag-raising ceremony, islanders came out to the ships to barter some produce and wares. Charles E. Longden, a member of the 1st California Volunteer Regiment attached to the hospital corps, commented on the scene in his

diary and wrote that: the "... cent piece generally had more purchasing power than a dime" (1898). The confusion lay in the appearance of the unfamiliar United States coins.

There is Little gold and no paper money on the islands. The money [is] principally Mexican, considerable Chilean, and a few Spanish pesos. The pesos and Mexican are worth ... fifty cents a piece, and the Chilean thirty-seven and one-half cents in U.S. coin (Department of the Navy 1898c:23).

After the fleet departed Guam and was again en route to Manila, Longden continued his observations on the journey "...nothing to see but water. Report has it that we land at another island only a few hundred miles away, possibly tonight or tomorrow" (June 23, 1898). Longden went on to mention a lecture on Manila by Major Tilden. Major Tilden, an officer with the troops on board CITY OF PEKING, stated that "Guam is still Spanish Territory because we didn't leave any troops there to hold it" (Longden 1899). The net effect of CHARLESTON's activity on Guam, however, was to establish the island as a coaling station for American ships engaged in supporting the Philippine war.

A short two weeks after the departure of CHARLESTON, the chartered transport USS COLON sailed into the Marianas. On board were members of the Utah Volunteer Light Artillery. George A. Fischer, one of the volunteers, observed:

... [that] the Ladrones islands are some of the most beautiful bodies of land I ever saw. Mountains covered with trees and a sea coast grown up with beautiful groves. This is the sight which met our eyes today. The islands stretched out like a chain. We did not stop here as we expect to meet some Spanish Forts tomorrow morning. Cartridges for our pistols were issued today (Fischer July 9, 1898).

An important opportunity was missed by the two groups of transports in the summer of 1898 to seize control of at least Saipan and extend American influence in the Marianas. The failure to take this action led to the severing of political ties between Guam and the remainder of the Mariana Islands through the Treaty of Paris. This separation, persisting to this day, profoundly influenced the history of shipping in the Marianas.

At the close of the Spanish-American War, the United States took control of the Philippines and formally annexed Guam as a naval and coaling station. The American Naval Administration on Guam began in August 1899 with the arrival of Captain Leary aboard USS YOSEMITE, the station ship. In 1900 General Wheeler completed a report on the first year of the island's administration and noted that there were four large ships in Apra Harbor. These were the transports USS WARREN and USS SOLACE, the collier USS BRUTUS, and YOSEMITE. "To these were added a small trading schooner, which gave the place quite a business appearance" (Wheeler 1900:29). This scene would change little through the years. The transports, the station ship, and the trading schooner would remain; the collier in time would be replaced by an oiler; and, for a while, the steamers of the Dollar Line would be present in the harbor.

In early 1903 Governor Sewell noted the arrival of the station ship USS SUPPLY with the comment that "... her roomy quarters and large storerooms make her well suited for the duty" (Annual Report of the Governor - ARG 1903:2). Sewell went on to express his gratitude to the Army transports that "... stop here on their outward voyage, bringing mail and stores, including fresh provisions, besides carrying passengers" (ARG 1903:2). On the question of the storage of coal for reprovisioning, Sewell found it more practical to leave it stored directly on the collier rather than offloading to shore and so requested that a ship be permanently stationed on the island.

The following year, 1904, Governor Stone spoke about coal being put on flat boats and poled to the reef for transfer. This process slowed down the transfer operation considerably (ARG 1904). Despite this, coal was provided to the supply and repair ship IRIS, the refrigerator ship CELTIC, the cruiser ALBANY, the auxiliary cruiser BUFFALO, the wooden steamer MOHICAN, the battleship and cruiser squadrons of the Asiatic Fleet, and the German gunboat CONDOR (ARG 1904). Stone mentioned that the Army transports called regularly each month, on a fixed date, but that the Navy transport SOLACE was the only west-bound connection, and he hoped it would stop three times a year in the future (ARG 1904).

The question of tariffs arose during the administration of Governor Dyer in 1905. He described the situation in these words:

... the absence of a freight carrying craft between San Francisco, Guam, and Manila throws all the trade with this Island into the hands of the Japanese. They have established stores, regular

lines of schooners, practically monopolize trade and fix prices. Under these conditions living expenses for the natives are cruelly high. Under the present organization the customs duties are necessary for island revenues but they should be abolished on all articles coming from the United States and Manila (ARG 1905).

Activity in the harbor that year focused on the coaling of the cruiser USS NEW ORLEANS, the station ship USS SUPPLY, the survey ship USS RANGER, and the Navy transport USS LAWTON. This activity was punctuated by the arrival of the American merchant ship KENNILWORTH and the passage of 20 Japanese sailing vessels (ARG 1905). The Army transports continued to be the regular transportation and commerce link with the United States. In an effort to encourage additional trading activity, Governor Dyer stated that he would like to see LAWTON, accompanied by SOLACE, make regular calls at Guam. In 1906 SUPPLY made a trip to the coast of China and Manila for needed supplies for the naval station and another to Yap seeking information on the telegraphic cable.

Two years later in 1908, Governor Dorn echoed his predecessors on the matter of trade:

No vessels flying the American flag touch here except the Army transports and an occasional war vessel. The transports are not permitted, by War Department regulations, to carry freight for commercial purposes. As a consequence, practically all the trade of Guam is in the hands of the Japanese, who are gradually acquiring the commercial mastery and buying up all the choice lands of the Island. They introduce their small schooners, a risk few merchants would care to take, [and bring in] large quantities of cheap and inferior goods of antiquated patterns which are sold at irregular and exorbitant prices (ARG 1908:22).

He went on to request that a small steamer line be subsidized to make monthly trips between Guam and Manila to carry mail, passengers, and freight (ARG 1908:23-24).

In his report for 1909, Governor Dorn wrote of negotiations by a local merchant for a small steamer to make the Guam-Manila-Hong Kong run four times a year (ARG 1908:5).

This, the governor felt, would increase trade opportunities and would result in an increase in cultivated acreage. The following year the same governor observed:

... reports from the outlying districts show an increase in the crops of rice, maize, camotes, and sugar cane, the crops being the largest in the past ten years.... The export of copra, the only article of export, amounted to 534 tons valued at \$33,610, all shipped to Japan (ARG 1910:1).

The business community received a lift when permission was granted to carry some United States commercial freight on Army transports duty-free, Governor Dorn made this comment on the new situation:

A notable result is that several of the Japanese firms have lately been placing orders, through a local American firm, for consignments of goods heretofore imported from Japan (ARG 1910:2).

Over the next three years copra continued to be the mainstay of the island. In 1911 there were five schooners trading between Yokohama and Guam. These carried all the copra from the island at a price set by the Japanese merchants (ARG 1911:2).

The outbreak of World War I had little direct impact on Guam. In 1914 Governor Coontz confined trade under foreign flags to two Japanese schooners, which made 16 trips between Yokohama and Guam during the year (ARG 1914:18). Also under Governor Coontz, the right to trade exclusively between Saipan and Guam was denied to the Japanese and trade between Manila and Guam steadily increased. The trade between Guam and San Francisco, because of the monthly arrival of Army transports, grew to significant proportions (ARG 1914:18).

In November 1914, SMS CORMORAN entered Apra Harbor and, failing to depart in 24 hours, was interned for the remainder of Germany's war (ARG 1915:3). The ship languished in the harbor for almost three years, until the vessel was scuttled by the crew and became a permanent resident on the sea floor.

SUPPLY made one commercial trip in 1915, during July and August, landing at Yokohama, Shanghai, Hong Kong and Manila. During that same summer a boat reached Guam from Rota with news of starvation due to a food shortage. A number of small boats went to, the relief of Rota, and other supplies were delivered to the Japanese governor in Saipan via one of the

trading schooners, MARIANA MARU (ARG 1916:26). The following year, in June, SUPPLY made another commercial trip to Nagasaki, Shanghai and Manila (ARG 1916:2).

The withdrawal of the Pacific Mail Steamship Company in 1916 created some problems for the Army because the company would no longer be available to carry additional military freight. As a result of the increased pressure on space available on Army transports, the quartermaster's department in San Francisco began refusing all shipments of freight for Guam except perishable naval stores. In response, Atkins Xroll began running a commercial line of schooners between San Francisco, Guam and Manila to fill in the void, Japanese schooners, under the control of the firm of J.X. Shimizu, also made frequent trips between Guam and Yokohama that year (ARG 1916:27).

During 1917 SUPPLY continued to make regular runs for commercial purposes, but by year's end these were discontinued until USS GOLDSTAR came in 1924 to serve as the station ship for Guam. From 1916 through 1919, the Army transports made their monthly stopovers in Guam in addition to visits by the Naval vessels AJAX (auxiliary), CAESAR (collier), CINCINNATI (protected cruiser), MONTEREY (monitor), ABENDARA (collier) and SATURN (collier). The American auxiliary schooners AVARUA, BERTHA DOLBEER, BERTIE MINER, ETHEL ZANE, XEAU HOU, MARIAN, HOEAU, SEAFARER and TAGUA stopped at Guam over the same period. The Japanese schooners DAICHI, TORA MARU, KOEI MARU, MARIANA MARU and NANYO MARU also came into the harbor at Guam during these years.

Governor Gilmer reported that USS NAPA (the station ship), USS BITTERN (a minesweeper), and USS ROBERT L. BARNES (the station floating oil depot ship) arrived in the harbor in April 1920 (ARG 1920:11). BARNES became the oiler, replacing the collier BRUTUS, and in later years became the vessel for training mess attendants on Guam for the Navy. Although BARNES survived World War I, it was eventually sold for scrap. In addition to the Army transports THOMAS, LOGAN and SHERIDAN, which made monthly trips, the Navy transports PENSACOLA and NEWPORT NEWS made the three round trips each in 1920 on the San Francisco-Manila run (ARG 1920:12).

In 1922 another Army transport, MADAWACKS, joined the three already in service. The Navy transports continued their monthly schedule and were joined by SS BORBYLINE, WEST HIXTON and INTAN. The Japanese schooners MARIANA MARU and NANYO MARU also continued to sail between Guam and Yokohama and brought trade goods and supplies (ARG 1921:13). Over the next three years, the American schooners SS GLYMONT, RADNER and RESOLUTE visited Guam; the two Japanese schooners

remained; the military transports continued their runs; and several Navy vessels stopped for fuel on the journey to Cavite from Mare Island (San Francisco). Late in 1924, USS GOLDSTAR (Figure 5.1) arrived to become the station ship under the command of W.W. Bradley who would eventually become a naval governor of Guam (ARG 1925:51).

Governor Price wrote that the first commercial steamer in several years, SS STUART DOLLAR, arrived in January 1925, and in February, SS PACIFIC joined the commercial service (ARG 1925:51). In 1926 both ships were replaced by SS STANLEY DOLLAR and GRACE DOLLAR (ARG 1926:22-23). These ships maintained commercial service to Guam until 1929 when DIANA DOLLAR replaced GRACE DOLLAR. The Army transports were cut back to two vessels a month during this period while MARIANA MARU continued to sail regularly between Guam and Yokohama. By 1932 a second Japanese auxiliary schooner, SAIPAN MARU, was in the Guam-Yokohama service (ARG 1932:76).

Governor George Alexander noted increased traffic in Apra Harbor in 1933 when YAMASHIRO MARU (for one year only) and CHOMEI MARU joined the small fleet of Japanese schooners. Other American steamers that entered the harbor were SS DEFENDER, DEL MONTE, SUNKIST and RESTORER (ARG 1933:85-87).

During the American Naval period, military transports continued to pass through the waters of Guam, the Pan American Airlines "Clipper" arrived in 1935 with greater frequency, more Naval vessels brought material to improve the base, and MARIANA MARU continued its trading.

Guam's busiest port, Apra Harbor, had three reported ship losses from 1898 to 1941. The first occurred on November 13, 1900, when the steam launch YOSEMITE sank during a typhoon. According to the Guam Recorder (November 1900, Vol. 2), the boat lost its first anchor, ran aground on the shoals at Calalan Reef, was blown off and lost a second anchor at Spanish Rocks, and was last seen at 8 o'clock in the morning.

The converted cable ship CS SCOTIA ran aground on Spanish Rocks in broad daylight on March 11, 1904. In the annual Report of the Governor for 1904, he stated:

... early in the morning of March 11th, the Cable Ship Scotia, in making into the harbor, struck Calalan Bank near Spanish Rock, became a total wreck, and after many days was abandoned and sold. ... The illfated Scotia had been ordered to this port for the purpose of moving the Midway leg of the Commercial Pacific Cable.

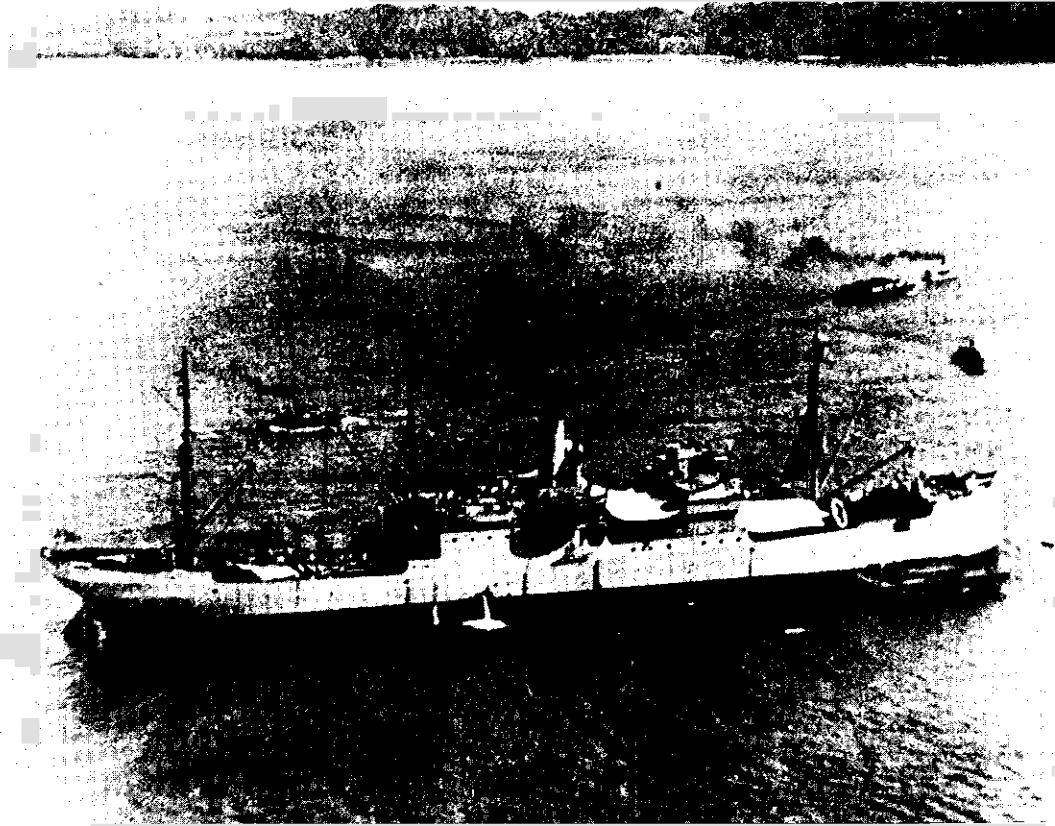


Fig. 5.1. USS GOLD STAR in 1924. (Photo by Department of the Navy)

At the outbreak of Germany's war with Japan, the crew of the German raider, SMS CORMORAN, entered Apra Harbor in the hope of obtaining enough coal and provisions to reach German East Africa. Captain Maxwell, the recently arrived naval administrator on Guam, met with the German captain, Zuchswerdt, but refused his request. Under international rules at the time, Zuchswerdt had a choice of either departing the harbor or having his ship interned for the remainder of the war. Unable to leave because of insufficient fuel and supplies, the German ship and crew were interned on November 15, 1914. Three years passed before American-German relations were broken and the German captain was ordered to surrender his ship. Rather than do so, he order the ship scuttled. On April 7, 1917, CORMORAN was sunk in Apra Harbor.

German and British Colonialism

By 1880, although both the German and British governments were reluctant to acquire colonial possessions in Micronesia, pressure from the large commercial trading houses, missionaries and plantation owners of both countries eventually resulted in an about-face on the position of nonintervention. German commercial influence in the Carolines, Marshalls and Gilberts, and British commercial interest in the Gilberts, Solomons, Fiji and New Hebrides were evident from the late 1870s. From 1878, when Germany concluded its first treaty with the chiefs on Jaluit in the Marshalls, German commercial and colonial interests grew. By the end of 1878, the German Imperial Government had signed a series of treaties ensuring trading privileges and establishment of coaling stations in the Ellice, Gilbert, Marshall and Duke of York islands as well as the northern coast of New Britain.

The British, ever mindful of the rise in German influence and concerned that the United States might also choose to interfere, annexed Fiji in 1874 and established a High Commissioner for the Western Pacific who was mandated to extend his authority over all British subjects in the region through the Royal Navy. In 1885 Germany laid claim to the Marshall Islands under protectorate status, and in 1892 Britain claimed the Gilbert Islands. The islands were partitioned between Spain, Germany and Britain prior to the outbreak of the Spanish-American War. The islands of the Marianas and Carolines continued to be claimed by Spain, the Gilbert Islands were under the protection of the British, and the Marshalls were under Germany (Figure 5.2). It was not until after the Spanish-American War that Germany officially

claimed the Caroline, Marshall and Northern Mariana islands and established administrative headquarters on Palau, Yap, Ponape, Truk, Jaluit and Saipan.

Northern Mariana Islands

German Colonialism, Japanese Control, 1898-1914--Trading Schooners, Mail Shim and Military Cruisers

Despite nominal control by Spain, neither the Germans, the British nor the Spanish were able to extend their commercial influence to the Northern Mariana Islands, where the Japanese held sway. In 1890, the South Sea Island Company was formed by Taguchi Ukichi, who sent TENYU MARU to the Bonins, Guam and Yap (Peattie 1988:16). This was not a highly successful venture, but it opened the door for future commerce. Two years later, in 1893, the Hiki South Seas Trading Company, Ltd., engaged in agricultural enterprises in the Marianas and set up small commercial stores (Peattie 1988:22).

In 1899, after the United States obtained Guam and the Philippines, Germany bought the rest of the Marianas from Spain, which extended Germany's colonial influence in the region. However, the Japanese merchants had established an important position in the trade for copra by this time. Georg Fritz, a German government district official or magistrate in the Mariana Islands, commented on the situation:

Merchants have no prospects since no transportation exists. The three companies [that] export copra on their own ships to Japan have the importation of goods in their own hands and have retail stores. Besides the sailboats of these companies, which sail between Yokohama and Guam, a postal steamer from the Reich on its way to Hong Kong stops in Saipan six times a year (Fritz 1906).

H. von Seidel, a German researcher, observed that letters from Europe went to and from Yokohama eight or ten times a year on a Japanese commercial schooner (Seidel 1903). Herman H.L.W. Costenoble, who eventually became the Director of Agriculture on Guam, said that "... the settler is discouraged from shipping German products by private cargo because he has to pay more [for] freight than what is bought" (1905).

During the German administration, the Northern Mariana Islands were the least productive of any in the

protectorate. This may have been based in part on the population mix in those islands. In 1902 there were only 1,100 Chamorros and 850 Carolinians living in the German-held islands, with the populations concentrated on Saipan, Tinian and Rota. Saipan and the northern islands were devoted to coconuts; however, even with official encouragement only a few hundred tons of copra were produced annually, and that by the Carolinian laborers. Unlike the Carolinians, the Chamorros were landowners and less inclined to work for someone else. On Tinian the activity continued to be mostly cattle-raising (Oliver 1961:354-355).

Overall, the Northern Mariana Islands were a financial burden to the Germans. Initially Saipan was the administrative headquarters for the group; however, the island lapsed into unimportance and the headquarters were eventually moved to Yap in the Carolines.

Although the German flag continued to fly at the customs house and German warships made occasional visits, the trade and economic life of the Northern Mariana Islands was firmly in the hands of the Japanese. By 1908 the Japanese-owned South Seas Trading Company (NBX) was formed to carry on commerce in Micronesia, including the Marianas. Saipan was at the outer fringe of the German Pacific empire, which now reached to New Guinea; however, that would soon change.

Caroline and Marshall Islands

German influence in the islands was focused on three kinds of commercial activity: as traders among the islands and general merchants in port towns; as planters growing principally copra and cotton; and as mine owners. The economic basis for German involvement was a key factor in the shift in emphasis from nonintervention to colonial expansion in the South Pacific. German commerce peaked in 1880, and after 1882 the European price of copra declined and did not recover until 1901. Coupled with foreign competition for copra and laborers, the German trading empire was slowly contracting in the mid-1880s. The influential Deutsche Handels und Plantagen-Gesellschaft der Sudesse Inseln zu Hamburg (DHPG), the large German trading company, was forced out of Rotuma in the early 1880s by the British, and sources of cheap labor and trading contracts were disrupted. When pressure mounted in 1885 to protect commercial interests and halt the decline, Germany annexed the Marshall Islands. This was Germany's second colony in the Pacific and was its most valuable acquisition because of the flourishing copra trade. Annexation of the Marshall Islands opened the door to German colonialism in Micronesia.

German Colonialism, German and Japanese Control, 1880-1914--Trading and Labor Schooners, Missionary Packets, Steam Freight and Passenger Ships, Mail Ships, Military Cruisers and Frigates

In 1880 the Pacific was considered the frontier zone of the German empire, but by 1886-1887, issues regarding the islands were discussed at the highest levels of the British and German governments. Initially, none of the participants wanted outright annexation; however, none could afford to withdraw from the region. There was the mutual desire, at governmental levels, for strong, native governments that would be able to maintain peace and provide the necessary security to foreign traders (Knight 1977:62). But desires notwithstanding, what was in place was a strong commercial monopoly that had a great deal of influence among the island peoples.

Although nominally under the administration of the Reich, after formal annexation and establishment of the German Protectorate in the Marshall Islands in 1885, control was ultimately in the hands of the Jaluit-Gesellschaft, a trading company formed in 1887. This company was formed from the merger of the two largest firms in the South Pacific, Robertson & HERNSHEIM and the DHPG. With 60 trading stations from Palau to the Gilberts, the Jaluit-Gesellschaft received exclusive rights to take possession of unoccupied land, to fish for pearl-shell, and to exploit phosphate deposits. In exchange, the company paid the salaries of the government administrators, provided housing and office facilities, transported officials on company ships and agreed to make up any deficit that might occur in the Protectorate's budget. Further, the company was assured that the Imperial Commissioner would follow the advice of the company on policy decisions and that no decrees would be issued until the company had an opportunity to review them (Purcell 1967:40).

In addition to strong pressure from Germans in the islands, the Australians consistently pressed the British for wholesale annexation of the islands both as an economic and military buffer (Knight 1977:64). Another concern of both the German and British governments was the distribution of coaling stations at strategic outposts from the Panama Canal across the Pacific. The annexation of the Marshall Islands, when coupled with other German-held islands, was the genesis for an unbroken chain of outposts across the Pacific. The acquisition of the Caroline Islands by Germany completed the chain.

Spain claimed the Carolines for more than three centuries; however, Spain never effectively occupied or administered the islands. With the spread of British, German and Japanese

traders in the mid-1880s and Germany looking with covetous eyes toward the Carolines, Spain sought to reassert its rights to the islands. The Anglo-German agreement of 1876 stipulated that both the Caroline and Marshall Islands should be considered within the German sphere of influence (Brown 1977:138). With that long-standing agreement in hand and after annexing the Marshall Islands, the Germans moved to formally acquire the Carolines by direct occupation of selected islands.

Spain, although recognizing that it could not prove direct historic administrative control of the Carolines, was loathe to permit German incursion. In 1882 a Spanish cruiser travelled through the Western Carolines in order to establish treaties with several of the island chiefs, and in 1883 the steamer CASTELLANO carried materials for the construction of a factory on Yap (Hezel 1983:309). In a further effort to stave off any claim by the Germans, Spain sent the cruiser VELASCO from Manila to Yap to collect information in preparation for the establishment of Spanish administrative headquarters (Figure 5.3).

Despite the activities of the Spanish, Prince Bismarck chose to announce the German intention to annex the Carolines. In response, the Spanish government sent the ships SAN QUENTIN and MANILA to take possession of the islands in late August 1885. In the meantime, the Germans had dispatched the frigate ILTIS to Yap with instructions to claim any islands not already claimed by Spain. The ships reached Yap within a few days of one another, and although the Spanish flotilla arrived first, the Germans claimed the island. For their part, the Spanish were appalled and demanded satisfaction for the Germans' presumptuous behavior. The Germans, mindful of world opinion and looking at the larger picture, agreed to have the dispute settled by the Pope. As a result, sovereignty of the Carolines was awarded to Spain, but Germany was given extensive trading privileges. More importantly, the papal decision established Germany's claim to the islands in the event Spain ever relinquished control (Brown 1977:140; Hezel 1983:309-312).

It was not until the close of the Spanish-American War that Germany again had an opportunity to pursue its colonial interests in the Caroline Islands. In the spring of 1898, a bill had been passed that supported German naval expansion. That same year another law was passed that was designed to encourage German merchant ship construction (Brown 1977:141). By late 1898, a large navy and merchant fleet was being developed, and the circumstances for acquisition of additional territory in the Pacific were ripe for colonial expansion.

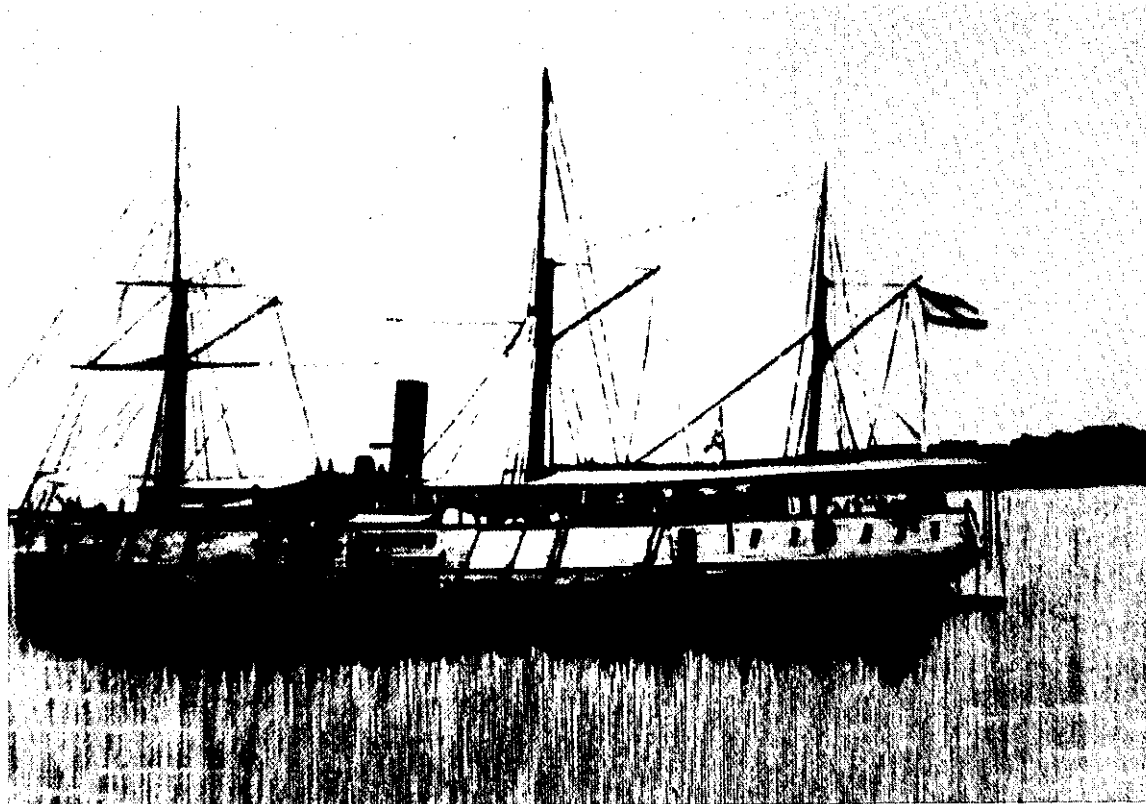


Fig. 5.3. Spanish steamer VELASCO visited many of the islands. (Courtesy of Micronesia Research Center Collection)

As early as July 1898, the United States was approached by the German ambassadors to London and Washington regarding the Caroline Islands. They suggested that Germany would support American occupation of the Philippines in exchange for consideration of Germany's claim to the Carolines. When the American peace conditions were accepted in August, Germany immediately began independent negotiations with Spain for any cessions that might be anticipated. After several rounds of negotiations between the United States and Spain, it was determined that the Philippines, Puerto Rico and Guam would be purchased from Spain for 20 million dollars. In the meantime, the German Foreign Office continued to press Spain for the acquisition of the Caroline and Mariana Islands, including Palau. It was not until February 1899 that any settlement was reached. Germany purchased the islands for 25 million pesetas and agreed to extend generous trading privileges to Spain (Brown 1977:141-150).

Although first Spanish and then German administrators had political authority over the islands, neither had a long-lasting impact on the people they were ruling. Unlike the people of the Mariana Islands who had undergone a long period of subjugation, the Caroline islanders were largely independent, living under traditional chiefly rule. When the Spanish garrison arrived on Ponape in 1887, it was faced with a well-developed political system that had long familiarity with Western and European civilization. The contact did provide acculturating influences, but despite that, the tribal chiefs dominated both their subjects and the success of commerce in the islands.

The attempt by Spain to actualize its claim in the Caroline Islands in 1887 and enforce colonial rule was a disaster. Unfamiliar with Ponapean social and political life and indifferent to traditional independence, the Spaniards arriving in their roles as colonial masters were met with a good deal of resistance by tribal chiefs. With the Spanish also came Roman Catholic priests, which added another element for potential conflict with the well-entrenched Protestant missionaries. After nearly a decade of military, tribal and religious confrontations, the Spanish had lost all credibility with the Ponapeans as colonial rulers (Hempenstall 1977:209-213).

When Germany acquired the Caroline Islands in 1899, the Ponapeans were unmastered and remained the rulers of their own country. The experiences of the Ponapeans under Spanish colonialism only reinforced their independence. The intertribal warring on the island and religious confrontations continued. The incoming colonial deputy governor, although faced with a situation that was uncontrollable and without a military apparatus to change

things, approached colonial rule from a less confrontational avenue than had his predecessors. Albert Hahl saw the Ponapeans as a people exposed to the worst elements of Western and European civilization. Hahl focused on earning the trust of the people and supporting local chiefly rule. He was eventually able to mediate some intertribal conflicts and to negotiate certain jurisdictional rights from the chiefs. Hahl's overriding mandate was to take no action that would result in or require military intervention. "Ponape was not worth a war and Berlin was prepared to sacrifice economic development for the sake of communal peace" (Hempenstall 1977:214). As a result, no direct administrative control was exercised on the island, and no colonial demands were made on the population.

Limited control was maintained through the chiefs and missionaries until 1908 when Ponape received its third administrator. Georg Fritz brought with him a program of land reform and social and economic development that was, in itself, generally acceptable to the existing chiefly structure. What Fritz did not understand was the depth of the traditional tribal factionalism on the island, which was presented under the guise of religious rivalry. Fritz's successor, Boeder, brought events to a fever pitch by forcing reforms and adherence to colonial rule and eventually sparking a rebellion by the Sokehs tribe in October 1910 (Hempenstall 1977:220-222).

When word finally reached the German outpost in China, four cruisers were sent to settle the matter. By January 10, 1911, EMDEN, LEIPZIG, NURNBERG and CORMORAN were at Ponape with 300 marines on board. Despite a blockade and a four-hour battle, the Sokehs were undaunted until they were denied access to available foodstuffs and small groups of marines, stationed at various locations around the island, were dispatched to search for and harass the clan members. In February 1911, the Sokehs tribe finally surrendered and Ponape became a true German colony. The principal result was that the Ponapeans were forced to give up their long-held control of relations with outsiders and accept a basic change in the system of land tenure and tribute (Hempenstall 1977:226-229).

Ponape was the exception rather than the rule, however. The agreement with the Jaluit Trading Company for administration of the islands was terminated in 1906 and, with Samoa and Ponape the notable exceptions, the Germans had little problem establishing colonial rule. They worked within the existing traditional power structures and permitted local island chiefs to exercise some authority over the natives. Kosrae was governed by a local elected chieftain who was under the jurisdiction of the German government office in Ponape. The

islands of Truk were divided into six administrative districts, collectively under the supervision of a great chieftain, whose position was hereditary (Purcell 1967:54). On Palau the islanders were governed by two great chieftains and six lower chieftains who were selected by the people, subject to German approval. In the remainder of the Carolines, the Germans simply empowered all of the chieftains who were in control during the Spanish period (Purcell 1967:55).

Under German administration, traders could not legally sell liquor or guns to the natives or extend them credit. Traditional property rights were respected, but land not specifically claimed was considered the property of the government and was redistributed to landless islanders. Foreigners were not permitted to purchase land and could only lease it for 25 years. Government and missionary schools were established and religious freedom permitted, although Spanish missionaries were required to leave when the Germans formally acquired the islands. American missionary activity continued throughout the German Colonial period; however, by 1906, these missionaries were supplanted by the German Leiberzeller group who continued to work throughout the Marshall and Caroline Islands. By 1908 the Spanish missionaries were replaced by German Capuchins of the Rhenish-Westphalin Order and by the Alsatian sisters of the Franciscan Order. There was also the Japanese Catholic group Seishinsha Dendodan. Hospitals and medical services were established on Ponape and Yap, and some agricultural research was conducted on Ponape (Purcell 1967:56-66).

While the fate of the Carolines was being decided half a world away at the highest levels of government on both sides of the Atlantic, the islanders were busily attending to their lives. Trade continued to flourish and there was a sizeable market for the merchandise that the companies furnished.

The people of the southern Marshalls [and presumably the Carolines] were ... buying large quantities of imported rice that they cooked in iron pots purchased from the traders. Ship biscuits were another delicacy Pipes and tobacco were always in great demand, even in places where Protestant influence was strong, [because] virtually everyone above the age of six, except for the most scrupulous converts, smoked incessantly day and night. Clothing, iron tools, and firearms were the old staples of island trade... [but by 1886] merchants were

catering to the people's new tastes ...
(Hezel 1983:317).

These new tastes included "hair oil, rings ... bread, salted meat, conserves, and beer" (Hager 1886:109).

Because of the Jaluit Trading Company's strong influence over the Protectorate's administration, it was able to eliminate foreign competition in the Marshalls through high business taxes on non-German companies. Hawaiian and American firms were bought out in the 1890s, and the British-owned Pacific Islands Company sold its Marshall trading stations in 1901 in exchange for the rights to mine phosphate on Nauru, part of the German Marshalls. The German Imperial Government extended the Jaluit-Gesellschaft's exclusive rights for trade to include the Eastern Caroline Islands in July 1900 (Firth 1977:17-18).

In addition to their trading enterprises, the Jaluit-Gesellschaft established a mail line between Jaluit, the other German-held islands and Sydney in 1900. In 1901, the passenger and freight ship GERMANIA, subsidized by the Jaluit Company, began making three trips per year between the German possessions, Hong Kong and Sydney (Purcell 1967:47-48; Henderson 1962:27).

In spite of the political upheavals in the region, copra manufacture continued unabated. The exports of the German companies continued to grow, and in 1900 copra comprised nearly 73 percent of the exports carried by company ships from the Marshall, Mariana and Caroline islands; by 1902, this figure had increased to 96 percent (Purcell 1967:44). Under German administration between 1904 and 1912, the production of copra exports in the Marshalls, Nauru and Eastern Carolines increased from 8,661,840 pounds to 10,613,900 pounds. In the Western Carolines, Palau and Northern Mariana islands, production increased from 1,319,340 pounds to 2,426,820 pounds (Purcell 1967:46). These increases may have been as a result of increased cultivation. Forced planting of coconut trees began on Ponape in 1900; each adult male was required by the German colonial government to plant and cultivate 10 coconut trees per month. Similar requirements were forced on Yap and Truk (Purcell 1967:45).

The Western Carolines did not produce the quantity or quality of copra that were obtainable from the Central Carolines and Marshalls. In 1892-1893, copra exports reached 1,000 tons, but declined after that because of an insect infestation. The situation was such that during the first two years of the German administration, all copra exports were halted in order to give the groves an opportunity to recover and to conserve

the dwindling food supply. A second copra embargo was enacted between 1906 and 1908 due to a drought (Department of the Navy 1944:28-29).

The Western Caroline Islands also presented some other difficulties for the Germans. Unlike the trade in the Marshall Islands and Central Caroline Islands where the Jaluit trading company was a near monopoly, in the Western Caroline Islands the Germans faced stiff competition from the Japanese.

As early as the Spanish period Japanese business had become strongly entrenched in Palau. When the Germans arrived they found the Japanese in control of nearly all the trade of this island group.... In 1912, 73 of the 122 foreigners living in the Marianas and Western Carolines were Japanese, and approximately one-third of the foreign trade in this area was with Japan. German mercantile interests were in second place, despite official support and encouragement (Department of the Navy 1944:29).

Japanese expansion into the Caroline Islands began in 1891 when Enomoto Takeaki, along with some business partners, founded the Koshinsha and established a store on Ponape. Although later transferred to Palau, the Koshinsha remained in business throughout the German colonial period. Another firm, the Nanyo Boeki Hioki Goshi Kaisha, had a thriving business on Truk until disputes with German officials and British and American merchants forced its departure in 1901. When the company left Truk, the owners arranged to have another Japanese-owned company become its agent in the islands, serving Truk, Yap, Ulithi and Elato. The Japanese firm, Nanyo Boeki Murayama Gomei Kaisha, attempted to establish a store on Ponape in 1901 but was denied permission by the Germans. The company ship, TAKEZO MARU, carrying the owner, Murayama, sailed to Ponape and he eventually arranged to have a Spanish merchant act as his agent. A second voyage resulted in permission to trade with Faraulep and Lamotrek, and a few years later the company obtained permission to trade directly on Ponape and Truk (Purcell 1967:20-22).

The Nanyo Boeki Murayama Gomei Kaisha merged with the Nanyo Boeki Hoiki Kaisha in 1908 to form the South Seas Trading Company, and by December 1908, the company had completed 10 voyages. This company traded in the South Seas (Nanyo) for more than 50 years and extended its influence throughout the region. The South Seas Company along with the Nanyo Kohatsu Kaisha eventually controlled all of the trade in the

German-held islands after they were turned over to Japan as mandated territories (Purcell 1967:22-23). From its inception, the South Seas Company ships were engaged in transporting freight, carrying mail and passengers, maintaining a chain of retail outlets that sold goods to the islanders and Japanese residing in the islands, and of course, trading in copra (Purcell 1967:22).

The discovery of phosphate on Ocean Island (now called Banaba) in the British Gilberts and on Nauru in the German Marshalls in 1900 added to the profits of the Jaluit-Gesellschaft and served to increase its monopolistic hold; the company quickly obtained exclusive rights on all mining on Nauru. The Pacific Phosphate Company, formed in London but including the Jaluit-Gesellschaft, provided enough return on investment that the trading company was able to greatly expand its business. After the Australian-owned Burns, Philip & Company complained that Germany was breaching the free-trade provisions of 1886, the Jaluit-Gesellschaft lost its exclusive trading privileges but was granted a 94-year lease on the phosphate concession as compensation (Firth 1977:18).

Although the Japanese were not owners in mining operations until after the outbreak of World War I, they were employed by the Pacific Phosphate Company on Ocean Island as early as 1905. They worked as carpenters, shipwrights, firemen, blacksmiths, woodworkers and cooks on three-year contracts (Purcell 1967:11).

Phosphate was also mined on Angaur in Palau. In 1903, while searching for coal, German investigators discovered phosphorous. In order to mine the deposits, the Deutsche Sudsee Phosphat Aktiengesellschaft was established in 1908. The government-owned company began mining on Angaur in 1909 and by the end of the year had mined 8,641 tons of ore; by 1913 that figure had risen to 90,000 tons (Purcell 1967:49). In 1913 the company also obtained rights to mine on Fais. Native laborers from Yap and Palau were forced to work the mines for a certain number of days each year; they were supplemented by Chinese workers and a few German administrators. The increase in shipping devoted to mining increased proportionately along with the tonnages of ore recovered.

Gilbert Islands

The British first attempted to exert formal control over the island group in late 1877 with the appointment of the Governor of Fiji as the High Commissioner for the Western Pacific with authority over all British subjects. Excessive

labor-recruiting in the Gilberts and elsewhere and heated public outcry forced the British to intervene, and British naval commanders were mandated to control the worst excesses. It was through this process, in the late 1870s and 1880s, and as a result of pressure from foreign competition that Britain renounced its principle of laissez-faire toward the region and began developing a framework for the establishment of a colony in the southwest Pacific.

British commercial influence in the Gilbert Islands was focused on three activities: collection of copra, limited trade and extraction of phosphate. This differs greatly from the other British-held possessions during this period where extensive plantation agriculture, trade and merchandising were present.

British Protectorate, British and German Control, 1880-1914--Gilbertese Baurua, Tradina and Labor Schooners. Missionary Ships. Colonial Government Ships, Steam Freiaht and Passenaer Ships, Mail Ships, Military Cruisers and Friaates

In 1892, the HMS ROYALIST was sent to Abemama, and on May 27 Capt. E.H.M. Davis proclaimed the islands a British protectorate. Under an order-in-council in 1893, the High Commissioner's authority was expanded to include Tonga, Samoa and the Union, Phoenix, Ellice and Gilbert islands. The Marshall, Caroline, Solomon and Santa Cruz islands; Rotuma; New Guinea (east of 143°); New Britain; New Ireland; and the Louisiade Archipelago were also brought under the commissioner's control "provided they were not already within the jurisdiction of any civilized power" (Graham 1970:147). Other islands in the southwestern Pacific outside the limits of Fiji, Queensland or New South Wales were also included if they were not already controlled by another nation. Following a flag-raising ceremony in the Ellice Islands, headquarters for the protectorate were first established in the Gilberts at Butaritari and in 1896 at Tarawa (Douglas 1989:300).

The Protectorate administration of the islands was based upon a simple code of laws designed to continue, as far as possible, the traditional native forms of government, albeit modified by mission and other foreign influences. The British Resident Commissioner, at first the only administrator in the islands, was later joined by district magistrates and councils of island elders. Before the establishment of the Protectorate, the islands were controlled either by traders, beachcombers, native chiefs or strong-willed missionaries. After the Protectorate, the most blatant manipulations by the missionaries were stopped as were the interisland and intertribal wars aimed at acquiring

more land (Sabatier 1977:155-158). Along with these changes came the requirement of community work and some taxation.

In 1895 Telfer Campbell, the first Resident Commissioner, came to Botio on Tarawa. It was really Campbell who instituted the new regime. Up till then we had not noticed any real changes.

He put a judge-magistrate on each island with an assistant, councilors and policemen. People had to obey the law under penalty of a fine or prison; they had to pay tax; make roads; build prisons, hospitals and houses for government officials. We began to find this a hard system; the police were feared and we longed for the old times. The government did do some good, however, the men who had fled to Abaiang were brought back and had their land returned to them (Unidentified informant in Sabatier 1977:232).

The government prohibited the sale of land to nonnatives and limited leases to no more than five acres.

By the late 1880s, there were estimated to be fewer than 50 traders in the Gilbert Islands, most of whom were small independent businesses trafficking in basic necessities such as cloth, tobacco, iron pots, knives, axes, rice and other tinned goods in exchange for copra (Sabatier 1977:147-148). Copra was the principal marketable resource and **was** produced on all of the islands by independent family groups. The only other way the islanders could obtain money to buy trade items was by marketing their labor. Gilbertese regularly signed on to work in the phosphate mine on Ocean Island or the plantations on Washington and Panning islands to the east. After the British claimed the islands under the status of a Protectorate, they instituted regulations that limited the amount of time an islander could be hired to one or two years. They also encouraged the move of the family group to lessen the impact of disruption.

In 1888, 11 traders were scattered through various villages on Butaritari, and by 1889 it was the busiest island in the group. Two American-owned companies, Crawford and Wightman, had small businesses, and the Germans in the Marshalls, like the British and Americans, used small sailing ships to maintain their trade. Although Butaritari was heavily visited by labor recruiters, the population did not decline

dramatically because of the abundance of copra (Sabatier 1977:203).

Missionary activity was widespread and, prior to 1888, solely in the hands of Protestants. The London Missionary Society was firmly established on Arorae, Tamana, Onotoa and Beru by the late 1880s. The American Board of Commissioners established themselves in the 1850s and were dominant in the northern islands and Ocean Island. Catholic priests began work in the group in 1888, using Nonouti as their base, and by 1914 had churches established on nearly all the islands (Sabatier 1977). The priests regularly travelled between the islands and between villages on the atolls by local canoe. The Gilbertese baurua were deep-water craft regularly used for interisland traffic and commerce (Figure 5.4). Sabatier recounts several instances where islanders and priests had near-disasters while travelling between the islands; however, it was not until the loss of Brother Bernard Lemmens along with three canoes filled with islanders in 1898 that the Protectorate government prohibited travel between Tabiteuea and Nonouti in bauruas (Sabatier 1977:270-271).

The influence of the missionaries and priests and the protection of the government helped to improve the overall health of the islanders. However, despite improved hygiene and occasional visits by doctors, two epidemics swept through the islands. The first was in 1890 when a virulent form of measles appeared on Nonouti. The population of the island was decimated with more than 130 deaths. The second was an epidemic of dengue fever in 1912 that was widespread (Sabatier 1977:196, 307).

After 1900 phosphate mining became the major commercial activity in the islands when it was discovered on Ocean Island. In the late 1890s, the London-owned Pacific Islands Company, working out of Howland and Baker islands, was collected guano. In an effort to expand its market, the company sent ships to other islands in search of mother-of-pearl and copra. In the process, a company representative visited Nauru and brought back what he thought was a piece of petrified wood. The wood sat around for three years before it was analyzed at the urging of Albert Ellis. When it was discovered that the wood was really a form of high-quality phosphate, the company sent Ellis to investigate.

Although Nauru was then claimed by Germany, nearby Ocean Island was not, and it too proved to have extensive phosphate deposits. In May 1890, Ellis negotiated an agreement with the natives on Ocean Island that gave the Pacific Islands Company exclusive rights to mine phosphate for 999 years for an annual payment of 50 pounds sterling. At the same time,



Fig. 5.4. Gilbertese 100-foot baurua under construction at Tabiteuea in 1939. (Photo by H.E. Maude)

the Pacific Islands Company also sought to obtain a license from the British Colonial Office that ensured the company sole rights to occupy the island from January 1, 1901, and to display the British flag. The license also stated that Ocean Island was a British possession.

The West Pacific British High Commissioner, although instructed to issue a proclamation to make Ocean Island part of the Gilbert and Ellice Islands Protectorate, determined that the island had already been annexed through the license given to the Pacific Islands Company, because that license referred to the island as a possession of Her Majesty (Douglas 1989:304). In September 1901, the ship HMS PYLADES visited the island and raised the British flag in an official ceremony.

The Pacific Islands Company, newly reorganized as the Pacific Phosphate Company, quickly began exploitation of the phosphate deposits. By 1907 phosphate production had become so important that the Protectorate's headquarters were transferred to the island. In 1909, the company had already exported nearly 2 million tons of ore. The company bought land from the Ocean Islanders for only 20 pounds an acre and paid them a minor compensation for the destruction of fruit trees. These terms eventually resulted in the refusal of the Ocean Island natives to sell the company any more land. The situation was not resolved until the company agreed to pay the islanders a royalty of 6 pence per ton on all phosphate mined (Douglas 1989:304).

The phosphate deposits were estimated to be 20 million tons in 1907 (Sabatier 1977:293; Oliver 1951:312). Mining was accomplished by recruiting laborers from the Gilbert and Ellice islands and was supplemented by a comparatively small number of Japanese and, later, Chinese.

There were no dramatic changes in the islands from the establishment of the Protectorate through 1914. A small ship, TOKELAU, was purchased by the colonial government in 1908 to facilitate interisland communication and increase its effectiveness (Macdonald 1982:115). Trade became concentrated in the hands of larger companies, phosphate mining on Ocean Island increased and missionary activity continued unabated. Freighters made regular calls at Ocean Island to leave supplies and collect phosphate; however, trading/passenger ships arrived and departed irregularly elsewhere in the island group. Other than the large Gilbertese canoes, these infrequent interisland ships provided the only means of communication.

Unlike earlier in the century, ship losses from 1880 through 1914 in the Caroline, Marshall and Gilbert islands were

primarily caused by human or navigational error rather than attack by islanders. In April 1882, the Spanish steamer ROMEO visited Yap and picked up 12 people stranded from the wreck of the mail ship AGUSTIN (Hezel 1979:24). The German trading schooner, CAROLINE, captained by Felix Becker, visited several islands in the Marshalls and Eastern Carolines while collecting copra in 1882. In August of that year after departing Yap, the ship wrecked near Woleai. In September or October, the crew managed to reach Ponape in one of the ship's boats (Hezel 1979:24, 86). The schooner, STAGHOUND, wrecked at Kosrae in August 1883. The crew remained on the island until November when they were rescued by the American missionary ship, MORNING STAR 111.

In January 1884, the Hawaiian labor-recruiting ship, JULIA, wrecked on a reef at Nikunau in the Gilberts. Capt. A.N. Tripp and the crew remained on the island for nearly 3 months before being picked up by the ship KALUNA and returned to Honolulu (Maude in Sabatier 1977:365). That same month in the Marshall Islands, the schooner RAINIER, under the command of Captain Morrison, wrecked on Ujae. The trading schooner was on its maiden voyage from Philadelphia when it wrecked on the reef. Some of the crew used a small boat to leave and were picked up by a British ship near Kosrae. Others remained on the island, constructed a small schooner out of the remains of RAINIER, and reached Jaluit in March. The remainder of the crew were picked up by the American ship, USS ESSEX, in April (Hezel 1979:140).

While the men from RAINIER were building a schooner, the missionary packet, MORNING STAR 111, captained by George Garland, was visiting the islands of Ponape and Truk. After rescuing the crew of STAGHOUND in November, Garland returned to Kosrae for a 3-week layover in December before heading to Truk and Palau. He returned to Kosrae in late February 1884. As the vessel was preparing to put in, it went aground and was a total loss. Captain Garland along with some of the missionaries left the island in early April on a small boat bound for Ponape (Hezel 1979:110).

The British steamer, BOTHWELL CASTLE, was rated A-1 by Lloyds at the time of its loss at Ngetik southwest of Ponape in the eastern Caroline Islands. The iron-hulled merchant ship was captained by H.D. Boyer out of Newcastle, New South Wales, when it wrecked on the reef on Christmas Eve, 1884. The captain and three crewmen left the island in a ship's boat while hoping to reach Guam. Instead, they arrived in Palau sometime in January 1885 where they remained for nearly two months before they were picked up. The remainder of the crew were finally rescued from Ngetik sometime before October (Hezel 1979:13-14, 88; Lloyds Registry of British and Foreign Shipping 1883-84). The German ship, KATHERINE, wrecked off

Faraulep in the western Caroline Islands in 1885. Captain Becker and his crew remained on the island for nearly 18 months before they were rescued (Hezel 1979:26).

In 1888 the trading schooner, GEORGE NOBLE, ran aground on Nonouti. The ship belonged to a Chinese company, On Chong, that traded in the islands. Because the crew were fearful of carrying a priest from Sydney to the Gilberts, the ship slipped away only to run aground. Father Leray, on Nonouti at the time, constructed a large cross from the ship's mast at the village of Taripo, a cross that was still visible in 1938 (Sabatier 1977:170).

The freight steamer, ELBA, wrecked at Ocean Island in the German-held Gilberts in 1904. Because of the difficulty of anchoring, transport and loading of phosphate could only be accomplished during calm weather with an offshore breeze. A sudden shift in the wind drove ELBA onto the rocks where its composite wooden and iron hull began to break up before sinking (Sabatier 1977:294).

Finally, the small schooner, HIRAM BINGHAM, owned and captained by the Protestant missionary Mr. Walkup, wrecked 20 miles off Butaritari in 1909. The ship was loaded with supplies and carrying a crew of four along with four passengers, three of whom were children; they made their escape in a ship's boat, finally reaching Ebon in the Marshall Islands after 21 days adrift (Sabatier 1977:224-25).

The vessel losses from 1880 to 1914 reflect the commercial and religious activities that were being conducted in the region by Americans, Germans and the British. Not represented are the activities of Japanese traders. Shipping losses by the Japanese certainly must have occurred; however, they are not documented in the non-Japanese language sources that were consulted. Japanese archives or contemporary histories may provide the necessary information on these ships.

World War I

Northern Mariana, Caroline and Marshall Islands

In 1914 the islands of Micronesia were held by Britain, Germany and the United States. Britain controlled the Gilbert and Solomon islands; Germany held the Caroline, Marshall, Northern Mariana and Palau islands as well as a portion of New Guinea and the Bismarck Archipelago; and the United States controlled Guam (Figure 5.5). Although there were repeated attempts at the establishment of an extensive

commercial network in the South Pacific, on the eve of World War I the

...Japanese government and private interests could only look back over nearly 20 years of misfortune. ...Undeterred by these setbacks and spurred only by the conviction that the Marshall, Mariana, and Caroline Islands were of commercial and strategic value, the Japanese government, from the outbreak of World War I, engaged in a diplomatic and military offensive to gain a territorial foothold in the South Pacific (Purcell 1967:xxii-xxiii).

Shortly after Japan declared war on Germany, two German cruisers rendezvoused at Pagan before beginning the long journey home and effectively abandoning the area. Japan quickly extended its influence by seizing several islands. For the next three decades both the economic and political destinies of Japan and the Northern Mariana, Caroline and Marshall islands were linked.

German Claim, Japanese Control, 1914-1918--Steam Freighter and Passenger Ships, Mail Ships, Military Battleships, Destroyers and Cruisers

At the beginning of World War I in Europe, the Japanese had no idea how long the hostilities would continue. However, it is clear from their actions that they had both territorial and economic aspirations, and the war provided an opportunity to act. Winston Churchill stated:

The attitude of Japan toward Germany suddenly became one of fierce menace. No clause in the Anglo-Japanese Treaty [of 1911] entitled us to invoke the assistance of Japan. But it became evident before the war had lasted a week that the Japanese nation ... showed themselves resolved to extirpate all German authority and interests in the Far East (Churchill 1924:314-315).

By entering the war and using the Anglo-Japanese agreement as a pretext, Japan could in no way be accused of territorial expansionism. Therefore, in early August 1914 when the British suggested to Japan that it might be helpful if Japanese naval vessels were sent to the China Sea to "search out and destroy German armed commercial vessels which were already harassing British commercial shipping" (Purcell

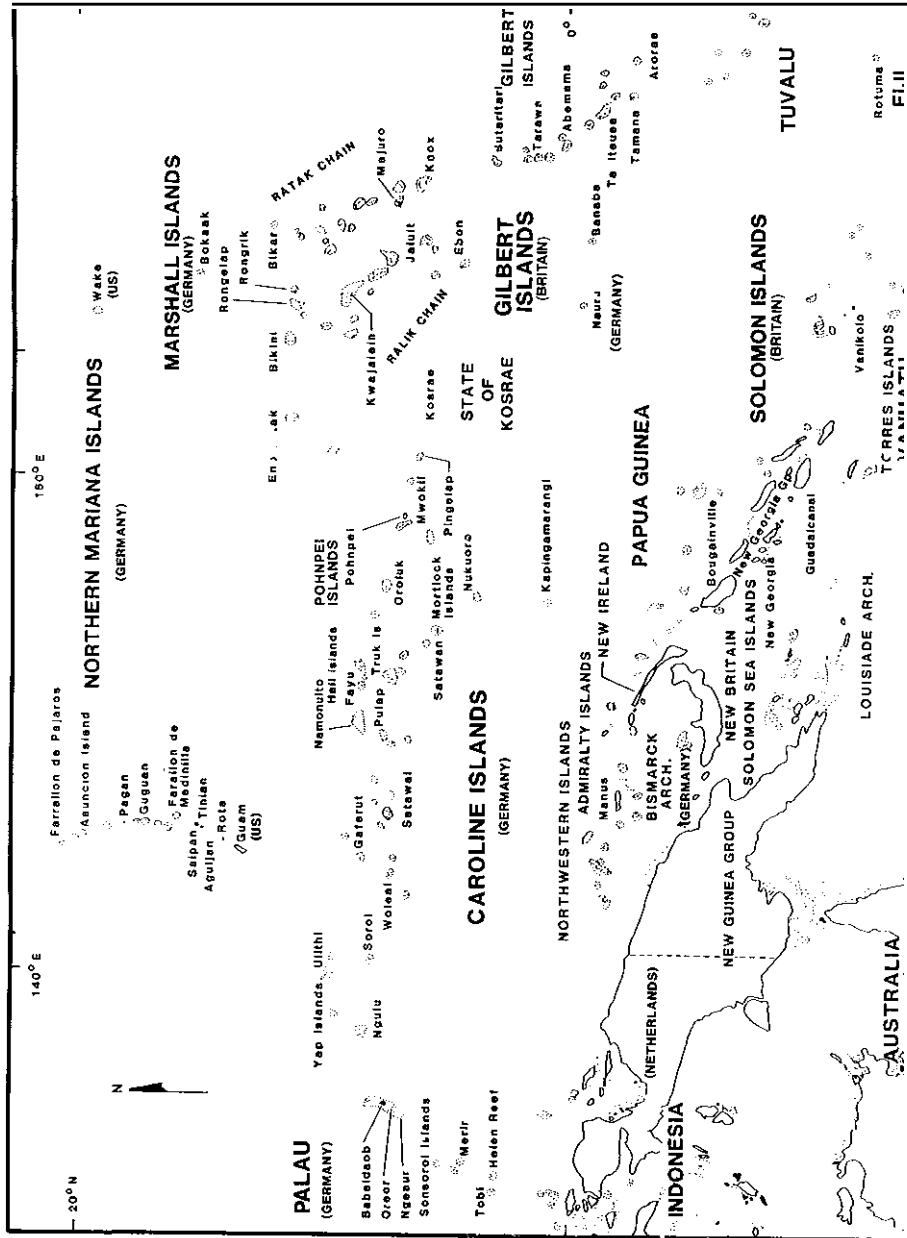


Fig. 5.5. Colonial status of the islands in 1914.

1967:75-76), the Japanese were extremely receptive. The Japanese; however, did not want to limit participation on such narrow grounds nor did they want to have to restrict military activity.

Japanese Foreign Minister Kato Takaii indicated to the British that military intervention in their behalf would require the use of all necessary means, and it would be impossible to stop at only searching out and destroying German ships. Further, according to the treaty, there would have to be a declaration of war. In response, the British Foreign Secretary Edward Grey wired the Japanese and asked them to postpone any military activity. The Japanese intention to declare war was made clear to Grey. The Japanese were committed to the protection of commerce on the high seas, which would "...necessarily involve the mopping up of German bases..." in the Pacific but "...in no way would threaten China or be injurious to British commerce" (Purcell 1967:78).

This placed the British in a difficult situation. The international implications of Japan's involvement in the war, the necessity of maintaining the neutrality of China, and Japan's "itchy trigger finger" all had to be considered.

In the early days the Japanese alliance was a matter of some embarrassment and even anxiety. Japan was ready to take her part in the war as our Ally; the Far East and the whole of the Pacific lay open to her and were her natural sphere of operations. But the prospect of unlimited Japanese action was repugnant to Australia and New Zealand. They already regarded Germany, her position, and transactions in the Pacific with some misgiving; they would have reviewed the substitution of Japan for Germany with positive alarm. Equally important, the effect of Japanese action on public opinion in the United States would be disastrous; it might even make American opinion antagonistic to us. We had, therefore, to explain to Japan that her help would be welcome, but that her action must be limited and her prospective acquisition of German territory must not extend beyond certain bounds (Grey 1925:103-104).

Despite the effort of the British Foreign Secretary to forestall the involvement of the Japanese, military

preparations were initiated and Japan was unwilling to moderate its position. Grey argued that if Japanese interests were being threatened by Germany, they should declare war based upon the Anglo-Japanese Treaty, but he wanted to make it clear that action against Germany should not extend beyond the China Sea. This was clearly unacceptable to Japan, which wanted a declaration of war that would leave it free to take whatever action it chose. After much negotiation, the British government realized that Japan had no intention of restricting its sphere of action, and further discussions were futile. A broad statement issued by the British only alluded to Japanese involvement beyond the China Sea.

The Governments of Great Britain and Japan ... are of the opinion that it is necessary for each to take action to protect the general interest in the Far East contemplated by the Anglo-Japanese Alliance, keeping especially in view the independence and integrity of China.... It is understood that the action of Japan will not extend to the Pacific Ocean beyond the China Seas except insofar as it may be necessary to protect Japanese shipping lanes in the Pacific, nor beyond Asiatic waters westward of the China Seas, nor to any foreign territory in German occupation on the continent of Eastern Asia (MacMurray 1921(II):1167).

Japan countered with the declaration that it made no promises to restrict its military activities and entered the war on that understanding in September 1914 (Purcell 1967:81-87). It is clear that the Japanese "persistently pursued a very deliberate course leading to a position from which Japanese claims to the former German islands were ... stronger than those of any other Allied power at the end of the war" (Purcell 1967:88).

Well before Japan formally entered the war, the German light cruiser, EMDEN, departed Tsingtao, China, and headed south. On August 6, 1914, a fleet of German cruisers commanded by Adm. Graf von Spee, then at Ponape, also departed for Pagan in the northern Mariana Islands. After Pagan, the cruisers sailed for Majuro, took on coal and supplies, and sailed east on August 30. This left the China Sea and the Pacific undefended by a German naval force.

In the meantime, on August 9, 1914, a small fleet of three British cruisers left for Yap in search of the Germans. When they arrived, the wireless station was bombarded and the

cable was cut. The Japanese also quickly seized the opportunity to dispatch a fleet to Tsingtao and put together three battleships and a destroyer to serve as a Pacific task force. On September 20, the task force arrived at Jaluit and took possession of that island without encountering any opposition. Three more battleships were sent to Palau on October 1. The two groups, referred to as the First and Second Squadrons, quickly occupied the German islands. Kosrae, Ponape, Truk, Palau and Angaur were rapidly taken between October 3 and 9, and on October 14 Saipan was seized. After October 14, all ships "... entering or leaving the islands ... were under the jurisdiction of the Japanese Minister of the Navy.... Nothing could be done without the permission of the Japanese military forces" (Purcell 1967:89-90) and the islands were firmly under Japanese military control.

This quick action by Japan was unanticipated by Britain. Although the British made an effort to restrict further naval action by Japan, the situation was already beyond their immediate control. The British wanted the Anglo-Japanese occupation of the Pacific to be temporary. Although the Japanese agreed in principal, they made it clear that they had already made a "...considerable contribution to the war effort... [and] were counting on British support... [in] acquiring the islands" (Purcell 1967:93). Japanese Foreign Minister Kato Takaaki further indicated that because of Japan's extensive contributions, when the war finally ended, it would be impossible for Japan to withdraw from the occupied islands.

In December 1914, it was obvious that the statements and subsequent actions by Japan were in direct contradiction to its previous declarations and assurances. Earlier, in August, the Japanese had indicated to the British that they had no territorial ambitions. However, by December, after occupying several islands, Japan agreed to have the ultimate disposition of the Pacific islands settled by the Allies, but made it clear it wanted permanent possession as a reward for participating in the war. British Foreign Secretary Edward Grey reiterated the British position in December 1914 that "all occupation of German territory either by British or Japanese forces [would] be without prejudice to the final arrangements which have to be made after the conclusion of the war" (Grey in Purcell 1967:94).

Although the disposition of the islands would have to wait, Japan's Foreign Minister Kato Takaaki moved to negotiate a separate peace with Germany. Secret negotiations continued until May 1916, when the British were finally informed. Foreign Secretary Grey eventually responded to the news with the comment that Germany should make a peace offer to all the

major combatants rather than negotiating with Japan alone. Grey's statements on the matter notwithstanding, the Japanese government continued to press the issue with Britain's allies and by July had convinced the Russians to sign a secret agreement supporting Japan's claim. This was the first in a series of agreements signed in 1916 and 1917 that ensured European support for Japan and its claim on the German islands (Ikle 1965:63). Eventually, all of the major powers agreed to support Japan and after the close of the war, the Empire was given the islands under a Class C Mandate.

After November 1914, there were no hostilities taking place in the Pacific, and World War I was taking place only in Europe, Africa and the Near East. This interlude, while European and American concerns were elsewhere, provided Japan nearly 6 years within which to establish itself as the administering force over the islands before any serious outside discussions or monitoring were instituted. During the remaining years of world War I, Japanese administration directly impacted the lives of the islanders.

On December 28, 1914, the South Sea Islands Temporary Defense Garrison was created. Immediately, the Japanese set about developing an administrative structure that would control the islands. The military headquarters were set up on Summer Island (Natsu Shima) and Saipan, Palau, Truk, Ponape and Jaluit were designated as civil government districts, each with a defense garrison and a government advisor. Garrisons were also established at Yap, Jaluit and Angaur, and each was under the control of a Japanese naval officer who had ultimate authority. Although there was some realignment of government districts and administrators, the final result was to place the administration of the islands firmly in the hands of the Navy by the end of 1917 (Purcell 1967:146-148).

Information on the administration of the islands from 1914 to 1918 is sketchy. It appears that the Japanese generally maintained the German system, insofar as taxes, local government, and agricultural policies were concerned. However, with the occupation came martial law, which remained in effect until December 1915, when military personnel were transferred to civil government districts and assigned police duties. By 1917 a separate force was established for police duties; however, there was little difference between the military occupational force and the new police force because both served as soldiers. Generally, the laws under which the islanders lived were little changed from those that had been in force during the German period.

A major change during World War I, however, was in the area of education-. German missionaries, who had been almost exclusively responsible for education, were expelled after

the Japanese arrived. In their place, officials of the Navy and representatives of the South Seas Trading Company (Nanyo Boeki Kaisha) assumed teaching responsibilities. Those native children fortunate enough to be in the same area as one of the few "teachers" received instruction in the Japanese language, singing and mathematics. This situation continued until late 1915, when 6 elementary schools were established, one each on Truk, Saipan, Yap, Palau, Ponape and Jaluit. Native children between the ages of 8 and 12 were permitted to enroll and were given 4 years of education. As before, instruction included the Japanese language, along with ethics and a skill or handicraft.

In 1918 the term of schooling was reduced to 3 years, although a special supplementary course was offered that could last as long as 2 years. At the same time, the government established facilities for education away from the main school buildings, which were called detached schools, in seven different areas (Purcell 1967:229-230).

Before Japan entered the war, a number of private commercial interests in Japan were concerned about their future position in the islands. Representatives of one company, the Nanyo Kogyo Goshi Kaisha, submitted a petition to the Japanese government in August 1914, requested permission to continue trading in the region, and expressed the hope of participating in the development of the area. A few months later, a group of scientists was dispatched to the Pacific islands to investigate education, agriculture, forestry, medicine, geography, ecology and botany, among other topics (Purcell 1967:152-155). In an effort to continue economic development in the region, the Japanese kept open for trade the harbors of Saipan, Yap, Palau, Truk, Ponape and Jaluit from the time the Japanese Navy occupied the islands; however, Kosrae was not opened until after January 1, 1919. Elsewhere, customs regulations and duties were established and trade continued unabated (Purcell 1967:149-151).

The Japanese intention to increase control over the islands was evidenced early in the war when they seized the German-owned phosphate mines on Angaur. The German South Seas Phosphorous Company, represented by the English firm of Samuels and Samuels, protested the takeover:

During the present war the Imperial Government have occupied the island of Angaur and ... have seized and exploited the phosphate mines which were private property. Several cargoes of the mineral have been shipped to Japan and it is understood will continue to arrive there

(Samuels and Samuels in Purcell
1967:156).

Despite the protest, by August 1915 all the Germans on Angaur had been expelled under the pretext that the company was not private but was subsidized by the German government. The Germans were, therefore, forced to leave for military reasons. A similar incident occurred in 1916 when 30 Germans were expelled from the occupied islands. Most were doctors and missionaries who had not been evacuated at the outbreak of the war (Purcell 1967:155-156). Having control over the mines and other commercial interests, as well as inserting themselves directly into the administration of the islands, the Japanese had consolidated their control. It is clear that the Japanese proceeded on the assumption that the islands were their territory after the announcement that Japan was entering the war. Japanese interest was not based upon the assumption that they would only hold the islands until the end of the war. These activities were clearly part of an overall plan to implement long-term Japanese rule.

During the period of Japanese naval rule, copra and phosphorous continued to be important exports; to these were eventually added sugar and alcohol. By 1917 the government had set up a shipping line to handle its expanding empire in the Pacific.

The Japan Mail Steamship Company (NYK) received the shipping contract between Japan and Micronesia, while the South Seas Trading Company (NBK) had the service from the regional centers to the outer islands. Within a few years the NYK Western Line had four vessels in service, making 55-day trips, that stopped at Saipan and Tinian. The NYK Eastern Line, with three vessels in service, made 50-day trips with stops at Saipan. The NYK also had a Saipan Line that made 48 trips a year to Saipan and Tinian. The NBK had the interisland service within the Marianas. It ran 17 times a year from Saipan via Rota to Guam and 5 times to the northern islands of Anatahan, Sarigan, Alamagan, Pagan and Agrihan (USN 1944:130). The NBK enjoyed a favored trade position because of the exclusive government shipping contracts. It built warehouses for copra and extended payment in Japanese goods, i.e., foodstuffs, sundries and tools, to the islanders (Peattie 1988:121). The NYK controlled external trade, with three lines, and NBK controlled internal shipping service within the Marianas. The frequent visits of the NYK and NBK lines brought some prosperity to the islands and supported Japanese expansion.

Gilbert Islands

The outbreak of World War I in Europe and the activities of the Japanese in the islands to the west and in China had little direct impact on the Gilbert Islanders. The Protectorate was nearly forgotten by the Home Office because it was secure and isolated. With the possession of mining lands, the Pacific Phosphate Company prospered despite reduced exports. There were minor staff and shipping shortages, but generally these proved to be mere inconveniences.

British Control, 1914-1918--Steam Trade. Passenger and Freight Ships, Colonial Government Ships and Gilbertese Baurua

Britain moved to annex the Gilbert and Ellice islands after the islands were named a colony on November 10, 1915. Britain guaranteed to continue existing laws and island governments and to protect land rights. After obtaining approval from the native governments, the Order-in-Council went into effect on January 12, 1916, and the Gilbert and Ellice islands formally became a British colony. Ocean Island, along with Fanning Island (now Tabuaeran in the Line Islands) and Washington Island (now Jarvis administered by the United States) to the east were incorporated into the colony later in 1916, as were the Union Islands (now Tokelau) to the southeast.

The colonial administrative organization changed little from that under the Protectorate. The British resident commissioner was supplemented by a treasurer, accountant, chief of police, three education officials and two telegraphists in addition to the district officers (Sabatier 1977:153). However, the laws under which the islanders lived were evolving. In the 1890s, under the missionary influence, the list of crimes included adultery and fornication, as well as theft, fighting, dancing, tattooing, piercing ears, telling lies and failure to observe the Sabbath. By the early part of the twentieth century, the high chiefs still held the traditional responsibility for the "good order and cleanliness" of their islands; however, they were given no specific formal powers and were no longer considered as part of the native governments. Instead, native magistrates and councilors were appointed by the British resident commissioner and district officers, who now held wide-ranging powers including review of all native court decisions. Punishable offenses no longer included failure to observe the Sabbath or fornication, and compensation for other crimes was discontinued. Rather, the principle of compensation for offenses began to be replaced by the Western concept of

punishment by a centralized colonial government (Macdonald 1982:126, 47).

The main sources of revenue continued to be customs dues, licenses, head tax, export taxes (on phosphate and copra) and land taxes. Copra and phosphate also continued to dominate the trade of the islands during the war.

Phosphate mining on Ocean Island continued to be profitable for the Pacific Phosphate Company partly because of their monopolistic practices and the reluctance of the colonial government to step in and assume more control. Under a hard-fought and heavily disputed agreement arrived at in 1913, the company was permitted to lease additional lands on the island. The Ocean Islanders, although not happy with the situation, were forced to accept the terms offered, which included the ability to retain the use of the land until needed for mining, and once the land had been mined, to reclaim and replant it to bring it back to its original state. Opposition to the company's use of the new lands arose over the terms of compensation for food-bearing trees. Although these trees were not specifically addressed in the new lease, the islanders wanted compensation for all food-bearing trees, not just the coconut palms.

More serious, however, was the issue of replanting the worked-out lands. Although a few trees were planted, the effort was half-hearted and had little success. Despite the fact that the company's ships arrived in ballast, that is, empty, there was no consideration given to bringing in soil, even though there was a suggestion that the islanders be required to move soil from their unworked lands to the mined areas. There was even talk of requiring the islanders to do so through a public works regulation (Macdonald 1982:101-103). The potential success of the reclamation was further hampered by a 2-year drought, and by July 1917, Edward Carlyon Eliot, the resident commissioner, reported that the replanting was "as dead as the trees which have been planted in the worked out areas from time to time" (Eliot 1917 in Macdonald 1982:103).

Because of the limited resources of the other islands in the group and the limited ability of the Gilbertese to obtain money for trade goods, they continued the practice of selling their labor. The Pacific Phosphate Company employed more than 1,000 laborers, the majority of whom were Gilbertese. Employment outside their home islands, for a year or two under contract, was established as a pattern in Gilbertese life by the close of the nineteenth century. The monies earned allowed them to purchase goods that would not have otherwise been obtainable and that had become the necessities of life. Trade generally remained in the hands of a few

companies and, outside of contract labor, the Gilbertese continued their traditional subsistence economy based upon copra, fishing and limited agriculture.

Unlike many of their Micronesian neighbors, the Gilbertese did not lose their canoe-building skills during the onslaught of westernization. They continued to build canoes for fishing and interisland travel within the Gilbert archipelago, which facilitated contact and exchange of goods and the movement of islanders. However, commercial shipping during World War I was both sporadic and limited into and out of the Gilbert Islands. General trade and passenger travel did continue but at reduced levels when compared to the prewar years. The most regular shipping activity was that associated with the phosphate mine on Ocean Island. This contrasts sharply with the activity of the Japanese in the Marshall, Caroline and Northern Mariana islands. Regular shipping traffic continued and, in fact, increased with the expansion of the Japanese Empire. General trade, copra and phosphate mining were the principal commercial activities.

No specific European or American shipping losses were identified for the Caroline, Marshall and Gilbert islands during the background research for World War I. However, Sabatier reported that between 1904 and 1928, two freighters wrecked at Ocean Island (Sabatier 1977:294-295). No other information has come to light regarding these ships. Documentation of Japanese shipping losses is difficult to locate. Given the increase in Japanese shipping during World War I, both between the islands and from the islands to Japan, there is certainly the potential that losses occurred. Information regarding these ships may be available in Japanese records.

Interwar Years

By 1919, the face of Micronesia, with the exception of Guam and the Gilbert Islands, had changed dramatically (Figure 5.6). Japan had consolidated its power and, coupled with that country's expansionist visions, the islands were treated as possessions rather than territories, effectively sealed off and integrated into the Japanese Empire.

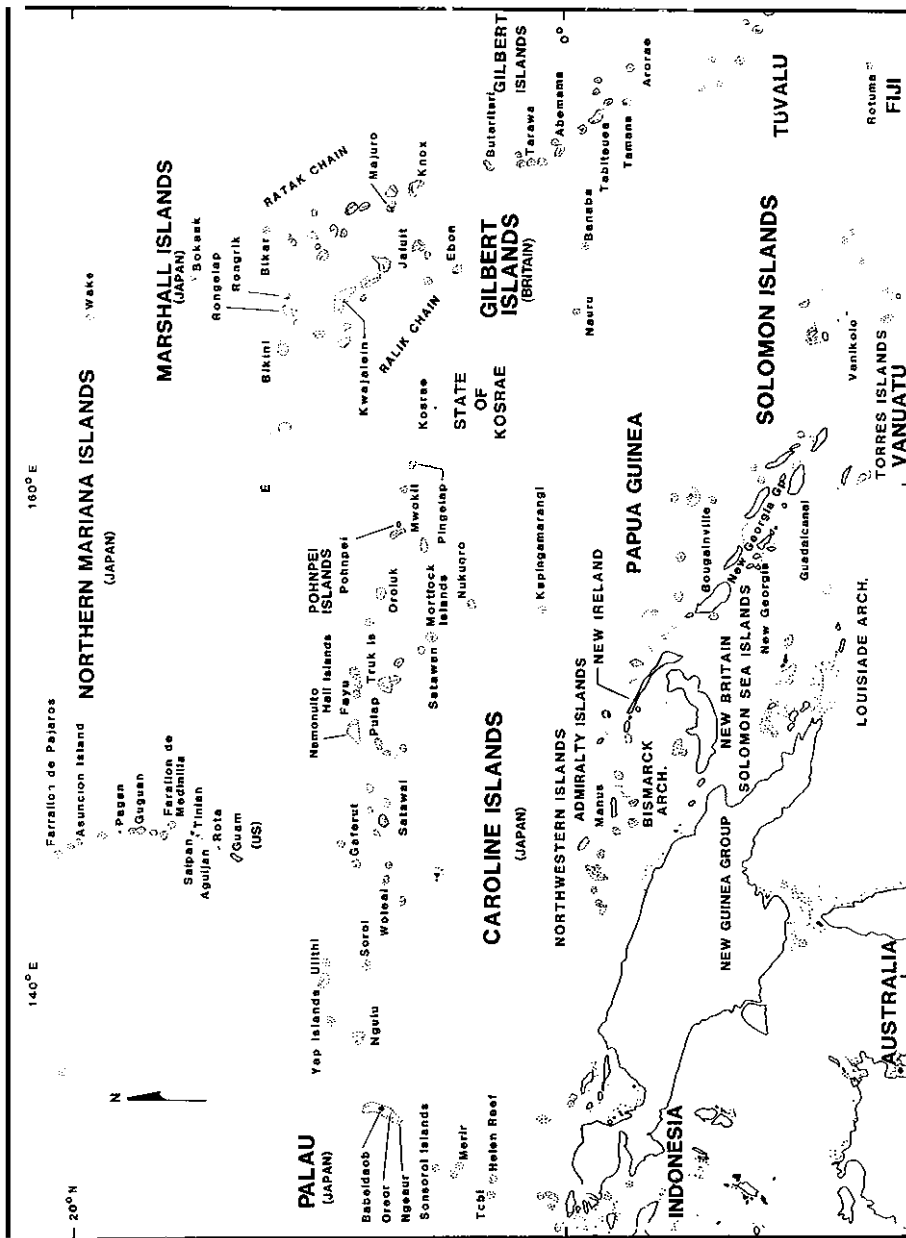


Fig. 5.6. Colonial status of the islands in 1919

Northern Mariana, Caroline and Marshall Islands

Japanese Mandate, Japanese Control, 1918-1941--Steam Freight and Passenger Ships, Mail Ships, Military Battleships, Destroyers, Cruisers and Aircraft

The Japanese officially began to administer the Mariana Islands (except Guam) after World War I when the islands were assigned to Japan as mandated territory by the League of Nations. In March 1922, shortly after the treaty with the United States was signed, the Japanese government placed the islands under the control of the South Seas Bureau and appointed an administrative director. Legislative power over the mandated territory was exercised by the Imperial Japanese Government in cooperation with the Parliament. The director of the South Seas Bureau, who reported to the Premier, was responsible for implementing the general laws of the Japanese Empire as well as laws specially formulated for the islands. Further, the director had discretionary authority to issue fines and imprison an individual for up to 1 year without a trial. He could also order military forces in the islands to perform tasks that were to the "benefit of public peace and order" (Purcell 1967:158).

In July 1920, an independent police division was established in the islands. In addition to their duties related to law enforcement, they also had responsibility for taking the census and in matters of public health. With the creation of the South Seas Bureau, a permanent police force was established, and by 1933, there were 159 members. The vast majority of police were on Saipan, but there were also offices on Rota, Tinian, Yap, Palau, Peleliu, Angaur, Babeldaob, Truk, Ponape, Jaluit, Kwajalein and Wotje (Purcell 1967:216). The police superintendent and the police inspectors were Japanese, while the number of Japanese and native patrolmen were about equal. Native patrolmen handled only those cases that involved natives until 1929, when procedure was changed to allow them to be assigned to any case, regardless of nationality.

The laws under which the islanders lived changed with the arrival of the Japanese. Along with Japanese civil and criminal offenses, the police also enforced a third type, the police offense developed to accommodate the special situations found in the islands. These included failure to prevent insect damage to coconut trees; neglecting to report births, deaths or changes in residence; concealing a person in one's house or boat; loitering; holding immoral banquets; dancing; lewd behavior toward women; adultery when the violated woman lodged a formal complaint; destruction or removal of government property; polluting water; castrating oneself or another person; tattooing; and failing to keep the

village streets clean (Purcell 1967:219). Although the police offense code applied to native and nonnative alike, it appears that it was written with the intention of controlling traditional patterns of native behavior.

Like the Germans and missionaries before them, the natives were prohibited from buying, making or accepting as a gift any beverage that had an alcohol content over 3 percent. The use and possession of firearms was also prohibited (Purcell 1967:223-224).

Until 1922, the Japanese did little to change the existing structure of government at the local level. The South Seas Bureau employed natives, who had held leadership positions during the German administration, as local government officials in the role of chieftain and great chieftain. In October 1922, the South Seas Bureau changed the system to one in which there were four native officials, based upon ethnic differences. The villages of the Chamorros were headed by a general village chieftain, kucho, who had control over a wide geographic area, and a village chieftain, iovaku, who controlled only one village. The villages of the Carolinians and Marshallese, referred to as kanakas by the Japanese, had roughly equivalent leaders called sosoncho and soncho, a general village chieftain and village chieftain. The biggest difference between the Chamorros and the kanakas was that the Chamorro chieftains were members of the community who had traditionally held power, while the kanaka chieftains may or may not have held power under traditional tribal patterns. Because the Japanese system did not always support or complement the traditional systems of the villages, a distinction between the traditional village chieftain and government office chieftains quickly developed. Further, the Japanese would make changes without hesitation, thus undermining the respect due and authority of the appointed government chieftains (Purcell 1967:160-164).

By 1919 there were sufficient Japanese children on some of the islands to warrant the establishment of separate schools. The standards for these schools, very different than for those of the natives, were designed to conform to those in Japan. At the time the South Seas Bureau was established in 1922, the detached classroom facilities that were previously established became schools in their own right.

Poll taxes, initiated during the German period, continued without much change until 1922. After that date, depending upon the wealth of a person, the tax could be as much as double the 10 yen normally due, and after 1927 the maximum was raised to 40 yen. Payment in copra, instead of cash, continued throughout the period. In the Marshall Islands,

the poll tax was not levied individually, rather the tax, in copra, was fixed for each village and was based upon the extant market price (Clyde 1935:93). The appointment of local officials and the thoroughness with which the poll taxes were collected were an immediate manifestation of Japanese domination. Because the taxes were paid in copra, this directly affected the livelihood of the islanders. Coconuts were a food staple as well as a form of currency and any increases or changes in the system had wide-ranging effects.

In the area of land ownership, the Japanese made significant changes. Only those lands to which the German government held formal title were transferred to the Japanese by the mandate. However, "the Japanese government started from the principle that the land which was transferred to Japan in its capacity of mandatory was land which ipso facto belongs to the state by virtue of the principle that all real property without owner belongs to a state" (Purcell 1967:172). The Japanese immediately encountered difficulties in implementing this philosophy because native land ownership was not clearly defined. Records were either incomplete or missing, land was owned on both an individual and communal basis, and ownership was based upon oral history or tribal custom. Under the Japanese system, all lands were divided into state or private domain, although private persons or corporations could obtain permission to exploit state lands. Because land ownership was an area in which considerable trouble between the natives and Japanese could occur, if not handled carefully, the Japanese moved slowly, but deliberately.

In 1916 all land transactions were frozen and only government officials were permitted to conclude any agreements with natives. From 1923 through 1932, a thorough survey of government-held lands was conducted in the islands. Following that, a survey of all privately held lands was completed. By March 1932, the islands of Saipan, Rota, Koror, Malakal, Arakabesan, Babelthuap, Ponape and Yap had been surveyed, a total of 220,052 acres. Native land ownership amounted to only 60,070 acres on those islands while Japan determined that it held title to 156,128 acres, the remainder being in nonnative private hands. The area surveyed represented approximately 41 percent of the total surface area of the mandated islands. The government also claimed ownership of nearly all of Jaluit, Peleliu and Fais, which it had purchased from the Germans for their phosphate mines. The discrepancy between Japanese-owned and native-owned lands was explained by a contemporary Japanese researcher who stated that

...probably the land that is entered as government land can be understood to

include the majority of land which traditionally was owned on a cooperative basis by the whole village (Yanihara **1935:267** in Purcell **1967:174**).

Once land ownership had been determined, the South Seas Bureau pursued an aggressive policy of leasing land to private interests with the understanding that the land would be used in keeping with the overall economic policies of the Japanese government. Most of the land was leased to only two companies, the Nanyo Kohatsu Kaisha, the South Sea Island Company, and the Nanyo Boeki Kaisha, the South Sea Trading Company. According to Yanihara, the land leased to these two companies amounted to just under one-third of the arable land in the islands (in Purcell **1967:175**).

When Matsue Haruji came to Saipan in **1920**, he was interested in sugar cane. After making an extensive survey of the island, he made the decision to attempt cultivation. He received permission to cultivate all government land rent-free. With this grant in hand, he formed the South Sea Island Company and proceeded to hire workers from Okinawa. Within a short time, Haruji developed sugar cane fields, sugar mills, railways, and distilleries on Saipan, Tinian and Rota. Through his efforts a "... single successful industry in the Marianas ... [became] the basis for the economic development of the Japanese Mandated Territory as a whole" (Peattie **1988:130**).

By **1932**, **18** percent of the arable land was being used for cultivation of foodstuffs and sugar, while 41 percent of the arable land was in coconut trees. Although sugar cane grew to be a major crop in the Northern Mariana Islands, very few natives were involved in the sugar industry as either tenant farmers or laborers; the facilities were, for the most part, staffed by Japanese immigrant workers (Purcell **1967:182**).

The South Sea Island Company was also involved in the production of alcohol and molasses on Saipan, Tinian and Rota; starch on Palau and Ponape; and bonito processing on Saipan, Palau and Ponape (Purcell **1967:187**).

Phosphate was discovered on Rota in **1930**. An elevated conveyor was built on the sabana to haul the phosphate down the hill to the processing plant where it was loaded into ships moored in Sasanhaya Bay for delivery to Japan. The operation on Rota joined other successful Japanese-owned plants on Angaur and Peleliu, in Palau, and on Fais in the Western Caroline Islands.

Unlike the sugar refining and other commercial pursuits of the Japanese, the mining and handling of phosphate ore did

not require a skilled labor force. As a result, a large number of native laborers were employed. The natives were brought from Yap and Palau until 1923, when the populations of those islands began to decline; the Japanese then turned to Truk and the Mortlock Islands. The workers were supposed to be recruited on a "volunteer" basis, although when the number of volunteers was insufficient, natives convicted of crimes could be sent to work off their penalties. The Chamorros were treated better than were their Carolinian counterparts, but all were conscripts, and working in the mines was compulsory. Natives from Yap were required to work from 4 months to 1 year, while Trukese and Mortlockese had to remain 4 to 6 months. In all cases, Japanese workers at the mines were employed in supervisory or machine-operating positions, while the Chamorros and Carolinians were unskilled laborers (Purcell 1967:192, 195).

Other commercial enterprises were also present in the islands during this period. The South Sea Trading Company's ships ran scheduled trips between the islands and Japan, and by 1933 the company had a network of 32 retail stores in the islands and a monopoly on the transport of freight. Unlike the South Sea Island Company that relied on nonnative labor, with the exception of phosphorous mining, the South Sea Trading Company depended heavily upon the native population for its work force. Natives were employed on the docks to handle baggage and cargos and as laborers on the copra plantations held by the company. Gradually, however, they were replaced by Japanese workers who were a readily available source of dependable, cheap labor.

In addition to South Sea Trading Company and the South Sea Island Company, there were a number of smaller retail trade companies working in the region. According to the South Seas Bureau, by the end of December 1932 there were 31 other firms handling retail trade and copra (Purcell 1967:199).

Fishing was the largest industry in the Western Caroline Islands. Despite the natives' acknowledged proficiency, fishing was almost entirely in Japanese hands. Koror was the main fishing center, but there were also smaller locales in Saipan, Truk, Ponape and the Marshall Islands. In the 1930s Japanese ships fished as far away **as** the Dutch **East** Indies, and the fleet numbered more than 350. Commercial fishing in the mandated territories resulted in annual catches of from 15,000 to 38,000 tons of bonito, plus quantities of tuna, trepang and trochus. Natives were permitted to collect trepang and shell, but all deep-sea fishing was done by the Japanese (Oliver 1951:357).

Throughout the Japanese period there was a comprehensive program to develop agriculture, industry and commerce in the

islands through a system of government subsidies. Both natives and Japanese were eligible for agricultural assistance if they would agree to devote their efforts to the cultivation and production of foodstuffs. Toward these ends, the government actively encouraged immigration from Japan and guaranteed the immigrant arable land. Between October 1924 and June 1927, three sites on Babelthuap totalling 2,593 acres were set aside for Japanese immigrant farmers. In 1927 a site of 1,963 acres on Ponape was selected. The government also provided seeds and equipment to farmers scattered throughout the islands (Purcell 1967:202). Although natives were, on the surface, able to receive government subsidies and even vocational training in agriculture, the number of individuals who received either was no more than a few hundred in any one year from 1922 to 1931 (Purcell 1967:233).

The South Sea Island Company, the South Sea Trading Company, and the Japan Mail Steamship Company, served the mandated islands throughout the Japanese administration. The Japan Mail Steamship Company's Western Line increased its number of voyages from 29 in 1937 to 36 in 1938. By 1941, the Nanyo (south sea) was a tourist destination for Japanese visitors travelling in vessels such as PALAU MARU.

The Japanese made an effort, at least until 1932, to administer the islands in accordance with the League of Nations mandate; however, it was done at minimal expense and for the maximum benefit of the Empire.

Japanese Military Activity²

There is no question that the mandated islands were being developed by the Japanese as advanced naval facilities, fighter and bomber long-range patrol bases, and as submarine bases during the interwar years. However, despite extensive efforts from 1931-1941 to establish interlocking air bases and to provide suitable naval harbors and intermediate repair facilities, these areas were never fully developed into first-class facilities that were well-protected from sea and air assault.

Edwin Layton, then Intelligence Chief for Adm. Husband E. Kimmel, said in May 1941 that he had prepared

²The following discussion on Japanese military shipping and aircraft activity during the interwar years was prepared by Don Boyer.

...detailed charts of the larger mid-Pacific atolls where [he] believed that Japan had illegally established military installations. The evidence had been provided from monitoring radio traffic, careful submarine surveillance, and occasional help from Pan American Airways... (Layton 1980:112).

The evidence Layton gathered indicated seaplane and submarine bases at Kwajalein and Jaluit, large radio transmitting towers on Ponape, airstrips capable of handling long-range bombers on Saipan, and development of a deep-water anchorage at Truk, among other items. The existence of military development in the mandated islands was considered in United States Pacific naval strategy up to the outbreak of the war, particularly because several islands could obviously be used as staging areas for a Japanese attack on Hawaii. As it turned out, only submarines assigned to the Pearl Harbor operation sortied from the islands; The carrier strike on Hawaii came from the Kuviles.

As Layton's report reveals, the U.S. Navy was conducting long-range submarine intelligence missions throughout the Mariana, Marshall and Caroline islands. The patrol reports for these missions, to date unpublished, might prove to be important source documents on military development in the area. Originally, the reports must have been highly classified because they were evidence of United States penetration into a restricted area, but they should now be available in the submarine historical archives.

The Imperial Japanese Navy, unlike its American counterpart, conducted very realistic training exercises in all weather conditions in all Pacific areas. This policy risked and damaged ships and aircraft, and killed men, but paid off with a high degree of readiness and skill in wartime maneuvers, a fact that would be impressed upon the U.S. Navy with great effect. The mandated islands saw continual movement of Imperial Navy ships on training exercises and other maneuvers in the interwar years. Admiral Layton's book reveals that a considerable amount of this naval activity was at least partially monitored through U.S. decryption of Japan's naval codes and other radio intelligence techniques. For example, in late May 1941, it was known that two Japanese aircraft carriers had attempted to strike and invade the Marshall Islands. Kwajalein's submarines and land-based aircraft played the defensive role. Upon conclusion of the exercises, the carriers visited Wotje, Kwajalein and Jaluit, home bases of the defending forces, before returning to Japanese waters.

Permanently assembled naval organizations, such as the South Seas Force, were stationed in the islands as war became more and more likely. The South Seas Force, the operational title of the Japanese 4th Fleet, was responsible for patrolling the Marshall islands. Air defense for the region came from the 24th Air Flotilla, which was also based at Truk and later Rabaul. Their operations were described at the beginning of the war:

...Flying boats and some land attack planes conducted daily long-range searches around major island bases to offer early warning of approaching American warships. The Japanese planned to stage in squadrons of land attack planes from widely scattered bases in order to concentrate them at the point of danger, a procedure that would prove ineffective in meeting swift American carrier raids (Lundstrom 1984:76).

Flight training exercises of this type were undoubtedly conducted in the Central Pacific as the island bases were developed. Information on operational losses is lacking in the historical records available to date, and it is possible that aircraft losses predating the war could be found in the region. The historical record indicates some smaller ships were lost in the Central Pacific, primarily by grounding or foundering.

Japanese destroyers and antisubmarine forces were also a continual presence in the area. Destroyers were well-suited to the role of "naval presence" because of their relative economy of operation. Destroyer and submarine squadrons operated from all the major bases, and Imperial Navy light cruisers often served as flagships of these squadrons. Larger warships, such as battleships and cruisers, would have operated on their own training and gunnery exercises; however, little information is readily available regarding the special operations of these big, fast warships. It is unlikely any large warships were permanently stationed in the Mariana, Marshall and Caroline islands during the interwar years, their presence being reserved for specific operations only. As the war in China heated up from 1931 on, the major warships, particularly aircraft carriers, supported this effort.

In most areas of the Pacific theater, information on the operation of the Japanese merchant marine is almost nonexistent. American sources indicate that U.S. rapid traffic analysis provided a partial picture of the movement of naval and merchant traffic during a portion of the

interwar years. However, the decryptations of Japanese rapid traffic have in general been researched only for other purposes, such as analyzing the Pearl Harbor attack or submarine histories rather than reconstructing an operational history of the Japanese merchant marine. If such information exists in Japanese sources, it has not yet emerged. An operational history of the merchant marine of Japan is long overdue, considering the enormous losses of ships and men during the war, but any such task would require thorough research of American intelligence records and Japanese assistance.

A good deal of information on the ships of the Imperial merchant marine was gathered by U.S. Naval intelligence; most of these ship data--size, speed, shape, etc.--are useful in wartime but are not particularly revealing about the operation of the merchant marine and how it was controlled, especially during the interwar years.

Intelligence data on the Japanese merchant marine are found in the well-known Office of Naval Intelligence publication ONI-208-J and include photographs of many ships that were operational in the interwar years. Clearly, there was a considerable effort made to collect these photos, which indicates that the U.S. Navy was well aware of the potential of Japan's merchant marine to serve in war. If intelligence efforts were made to construct an "operational guidebook" on these merchant vessels, reference to it has not shown up in the general war histories or those directed to the Pacific submarine campaign, the most logical area for this historical information to surface.

Despite lack of information on interwar and later, wartime, merchant vessel movements, much can be surmised from the fact that the islands required regular resupply from the homeland. Many of the civil steamship lines had standard routes through the mandated islands to carry people and supplies to the major commerce centers; these were primarily passenger-cargo ships, although there were some cargo vessels. Passenger liners carrying foreign traffic were not routed through this area nor, as far as is known, were foreign freighters working under contract for the Japanese. In 1937, for example, 46 percent of Japanese goods "...had been transported by vessels under foreign flags, principally British, American, German, and Norwegian" (Roscoe 1949:308; Lundstrom 1984:76).

The Japanese air bases and naval harbor facilities required regular merchant traffic for supplies and placed heavy demands on naval auxiliaries for fleet repair and maintenance. Naval and merchant tankers were required to provide fuel for ships, aircraft, and vehicles. Tenders were

required to maintain submarines, destroyers, and patrol craft. Several large naval auxiliary tenders were always deployed with the 6th (submarine) Fleet when the units of the 4th (South Seas) Fleet deployed throughout the islands. Their major anchorages were usually Saipan, Palau, Kwajalein and Truk. Seaplane carriers also operated in the area, both augmenting existing long-range patrols and engaging in training exercises.

Harbor facilities required considerable ship-borne support, and each of the developed harbors would have supported antisubmarine patrol craft, gunboats, guard ships, harbor vessels, small supply and landing craft, tugboats, barges (for fuel, food and waste), seaplanes and net and buoy tenders. The shore-based support facilities were needed to maintain such a fleet of harbor vessels. Minelayers and mine sweepers, all naval vessels, would also have been closely associated with major naval facilities throughout the interwar years. Losses of any of the smaller craft in the area are not specifically documented, but considering the nature of the sea and the nature of men, losses must be presumed.

Traffic in the islands or between Japan and the islands was of a more sinister nature than naval ships on precise training maneuvers. The long-range reconnaissance patrols of U.S. submarines were touched on briefly; these were exceptionally realistic "maneuvers" because caution would have been required to avoid detection. Had any of these submarines been detected by the Japanese, it could have caused an international incident.

It is well documented that, as the war approached, many Japanese merchant vessels carried Japanese officers in mufti, doing a little spying on American facilities. Although not specifically documented in historic record, some of the interwar photographs of Japanese merchant and naval vessels hint that the United States was not above taking a photograph through a porthole, just as the British did of their German counterparts. Spying is an accepted part of intelligence, and several specific Japanese intelligence operations originated in the islands. In 1926, for example, the light cruiser, YUBARI, and the naval tanker, SATA, later sunk in Palau, shadowed the annual U.S. Naval maneuvers in the Pacific and gathered electronic intelligence; the tanker, ERIMO, did the same thing in 1932.

The peacetime operations of the Imperial Navy, its air arm, and the merchant marine, are not well documented in the historical record but can still be inferred to be the dominant economic and social influence in the mandated islands between the wars. As World War II drew closer, more

and more land- and sea-based military material and personnel began to enter the area in preparation for the expected expansion across the Pacific. By December 1941, these islands were fully prepared for their role in the opening of the Pacific war.

Gilbert Islands

British Rule, 1918-1941--Steam Trade, Passenger and Freight Ships, Colonial Government Ships and Gilbertese Baurua

Following the end of World War I, the future of Ocean Island and its relationship with the rest of the Gilbert islands and Nauru became the subject of heated debate. Nauru, even richer in phosphate than Ocean Island, was seized by Australian troops at the outbreak of the war in 1914. Although Australia was unwilling to relinquish the island, and the United Kingdom and New Zealand could not come to agreement about administrative control, all agreed that the industry and its profits should come under government management. Accordingly, the Pacific Phosphate Company was bought out, and under a tripartite agreement effective June 1920, the United Kingdom, Australia and New Zealand assumed direction through the British Phosphate Commissioners (BPC).

Under the new organization, the BPC was able to increase efficiency through mechanization and to reduce the price of phosphate by reducing the profit margin. The increasing availability of phosphate directly benefitted the agriculturalists in Australia and New Zealand. In the second year of the BPC's operation of the mines, they "...further reduced its price to farmers, covered all costs, established reserve funds against every possible contingency, showed a surplus in excess of two hundred thousand pounds ... and still complained [the BPC] was over-taxed" (Macdonald 1982:116). The BPC felt that they should only be required to bear the costs associated with the administration of Ocean Island and not the rest of the Gilberts and Ellices. The government position, adopted in 1920, maintained that "Ocean Island was but one portion of a fairly extensive little Colony and could legitimately be taxed for the benefit of the whole" (Fell in Macdonald 1982:117).

Despite apparently sufficient revenues, the administrative staff of the islands was cut during 1923-1924 and the colony's ship, TOKELAU, was sold. In addition to limiting communication between Ocean Island and the rest of the colony, district officers could only visit the more remote islands by obtaining passage on ships belonging to the few

trading companies in the region or on one of the BPC freighters.

The BPC was extremely influential with the colonial government and did not hesitate to use its power to seek tax relief in 1932 in exchange for an agreement to meet any shortfall between government revenues and expenditures. As a result of this agreement, the BPC replaced the Gilbertese laborers with Chinese, further reducing the cash income of the islanders, which was already depressed by low copra prices (Macdonald 1982:121-122).

By 1937, the situation was such that the new High Commissioner, Sir Arthur Richards, expressed deep concern regarding the extent to which the government had lost control of the finances of the colony.

I may say at the outset that, so far as I can see, the agreement has not worked out ... and I cannot avoid the conclusion that far too much deference has been accorded to the views of the Commissioners in the matter of Government expenditure. ...the Commissioners assumed a right to criticize every item of expenditure, and, no doubt encouraged by the conciliatory attitude of the Administration, took full advantage of the position, extended their criticism to all Government activities and instituted a campaign of Government economy (Richards in Macdonald 1982:122).

Until the late 1930s, the colonial policy toward the islanders themselves was one of paternalism. The assumption was that the islands would remain impoverished, that development should be limited, and education should "have no greater purpose than to make its graduates better citizens in a limited atoll environment" (Macdonald 1982:125).

Secure in their isolation and supported by the attitude of the colonial government, the island magistrates became even more authoritarian and attempted to regulate all aspects of the daily lives of the islanders. In the 1920s, prosecutions and convictions were widespread, and in any given year the equivalent of three-quarters of the adult population were found guilty of some infringement, the vast majority of which were minor and related to the cleanliness, or lack thereof, of houses and villages (Macdonald 1982:126-127).

In 1926 Arthur Grimble was appointed resident commissioner. A protectionist and a firm supporter of colonial policy,

Grimble wanted to prevent outside influences from corrupting the islands. The paternalistic attitude of the colonial government culminated with Grimble developing a uniform law-code that was applied to all of the Gilbert and Ellice islands. Published in 1930, the Regulations for the Good Order and Cleanliness of the Gilbert and Ellice Islands included such admonitions as the elimination of soliciting goods and services, the control of adoptions and parents' duties towards their children. The care of the aged or adoptive parents, dogs, pigs and fowl were regulated. Celebratory feasts for marriages, births, betrothals and puberty required permission, and competitive feasts or public feasts for visitors were forbidden. Public dancing was permitted only on certain days during specified hours. "All males attending dances were to carry lamps; children could not attend, shameful gestures and movements of the body, magic rituals, and unclean games were prohibited" (Macdonald 1982:127).

Law-codes such as these were common in nineteenth-century Micronesia but had all but disappeared under colonial rule in the twentieth century. Even by contemporary standards, the regulations were considered to be "Spartan in character and draconic in their severity" but the high commissioner and his staff offered little more than token resistance to Grimble's recommendations (Macdonald 1982:128). In spite of their obvious paternalism and attempt at sweeping control of the islanders, the native governments were selective in their enforcement of these laws.

They supervised communal works, inspected houses, and enforced the curfew but where the law came into conflict with customary modes of behaviour still held in respect, no action would be taken. Despite the law, life crises were still marked by feasting ... goods and services solicited, and its doubtful whether the incidence of abortion was significantly reduced. ...offenders who had committed acts regarded as distinctly antisocial --for example, theft, incest or rape-- were often punished by family or community action without reference to courts (Macdonald 1982:129).

Although there was a concerted effort on the part of the colonial government to eliminate traditional authority, it was no more successful than it had been with the legislation. On Makin, Butaritari, Abaiang, Abemama, Kuria and Aranuka the high chiefs and their families continued to wield considerable power, using their influence to undermine

the native governments where possible. "Even where chiefs had long since abdicated in favor of pastors, or the old men had apparently surrendered their power ... there was a general adherence to a deeply-rooted body of custom upon which alien laws and religious beliefs had made only a superficial impact" (Macdonald 1982:129).

After 1932 there was a move to dismantle the paternalistic legislation and administrative control epitomized by Grimble. The change was lead by H.E. Maude, along with a new generation of district officers, who worked toward developing more even-handed legislation that recognized traditional leaders and customary laws. As a result of their efforts, a new code was drawn up that recognized the diversity of customary law, although all the native governments were still bound to a general code that dealt with public health and safety, communal works and freedom of worship (Macdonald 1982:138). These changes were supported in 1937 by the newly arrived High Commissioner Sir Arthur Richards and later by his successor. They attempted to make changes in the overall administration of the colony, including moving the headquarters from Ocean Island to the Gilberts, and improvement of education and health services. Unfortunately, substantive changes would not take place until after World War 11.

Missionary activity continued on all of the islands. Butaritari and Abaiang, mostly Protestant in the 1890s, were mostly Catholic by the 1930s. The shifting of religious affiliations in the islands occurred gradually and without fanfare. Further south the denominations were generally evenly balanced, the decision to choose one over another based as much on residence, kin relationship and political loyalty as the presence or absence of one mission or another. There was harassment and bickering between groups and the "...adherents of each adopted their chosen cause with a fervour and intolerance that could be matched only by a minority of the European missionaries" (Macdonald 1982:129). However, overall the incidents were minor and mostly of a petty nature.

The missions continued to carry the major responsibility for education, and by the 1920s, both the Gilbertese and Ellice Islanders were literate in either their own language or Samoan. Education was compulsory, although the schools were only minimally supported by the colonial government until the early 1920s. In 1922, a government-built school was opened on Tarawa; its aim was to improve the education of the islanders and train them in English so that they could fill basic government positions.

In addition to legislative and educational changes, the 1930s saw a move to help the islanders obtain greater returns from their lands through the development of cooperative trading societies. The first cooperative society was established in the Ellice Islands in 1926; as a result of its success, the concept was immediately introduced in the Gilbert Islands. From the 1870s, local island leaders had been attempting to exert some control over the cost of trade goods in exchange for their copra. The rapid dominance of the large trading firms quickly eliminated the independent trader and negated local efforts to effect an equitable exchange rate. With the establishment of the cooperative societies, the islanders became directly involved in the import and export of goods and copra. By the mid-1930s, there were 34 societies operating in the Gilberts. Most had fewer than 200 members each but, despite their limited numbers and fledgling business skills, the societies were successful (Macdonald 1982:141-142).

Only one documented, commercial ship loss was discovered during the background research for the period 1918-1941. It is the British-owned freighter, **OCEAN TRANSPORT**. While waiting to be loaded with phosphate at Ocean Island, the ship was driven onto the reef and wrecked on January 30, 1928 (Sabatier 1977:295; Hocking 1969:520). However, given the extensive fishing and interisland trade that occurred, there must have been some losses of Japanese or native boats. Unfortunately, these losses can only be surmised based upon the general activities taking place during the interwar years; no documentation has been located to date to identify any specific losses.

CHAPTER VI. WORLD WAR II

By Don Boyer

Introduction

The events of World War II in the Pacific had a profound impact on the people of Micronesia. While under the control of the Japanese, the mandated islands experienced some economic growth. However, for many of the islanders Japanese military rule often resulted in harsh and cruel treatment; the advent of hostilities did not make their lives any easier. The islanders on occupied Guam felt the full brunt of Japanese domination because of their close ties to and support of the U.S. All the islanders in Micronesia suffered from shortages of food and other necessities as the U.S. was increasingly able to cut off resupply by merchant ships. U.S. bombing during aerial raids, preinvasion salvos from ships and planes that were aimed at reducing Japanese defensive strength, and finally the assaults by troops resulted in the wholesale destruction of support facilities, villages and the islanders' economic base. Family members were often separated or killed, and their way of life was in chaos.

The war in the Pacific is now part of the history of Micronesia. The physical remains of the war, the ships, planes, men and materiel are also now a part of the archeology of the islands. In order to fully understand the value of these remains, both in terms of past human suffering and present historic significance, a discussion of the critical position occupied by Micronesia, both as Japanese possessions and American bases during World War II, is necessary.

Particular attention is given to Japanese naval and merchant ship operations because Japanese ships operated in the Central Pacific over a longer period of time than did American ships, and these form the majority of the wrecks still found in the area. During the course of the war, a few American ships were lost in the Central Pacific; however, these losses are well documented. Many amphibious assault craft were also lost and most areas have remains of these small vessels.

For this overview, the Central Pacific area includes those islands now referred to as Micronesia, more specifically the Gilbert, Marshall, Caroline and Mariana island groups.¹

By 1918 the Japanese were already an industrialist nation and had well-defined imperialistic tendencies. The acquisition of island territories in the Pacific was far from haphazard, rather it was part of an overall plan to gain ascendancy, or at least avoid domination, in the Far East. The advantages inherent in obtaining a string of island bases, forming a neat wedge between U.S. Territories in the Pacific, was not lost on Imperial Japanese military planners even if the development of aircraft had not yet progressed to the point where long-range air power was a serious consideration in military planning. The Japanese demonstrated that it was the geographic location of these islands in the Pacific that was of paramount importance to any military planning or political maneuvering by either side. The islands were never important to the Japanese for their resources, economy or ability to absorb a burgeoning population. Because of this, the Japanese military, particularly the Navy, usually had far more influence in this area than did the civil Japanese government in the period between World Wars I and II.

Between the wars, Japan strictly excluded foreigners and foreign merchant traffic from its island areas. Historical information on interwar development of air and naval military bases, aircraft flight operations, Imperial Japanese Navy exercises, merchant traffic, and harbor development is almost nonexistent in published U.S. sources. Knowledge of merchant ship operations of this era is particularly lacking. What is known is that military development certainly did occur, forming interlinked air bases as well as forward naval operating bases for both submarine and surface forces. Any war planning on the part of U.S. Naval forces in the 1930s had to include consideration of the air and naval capabilities of such places as Truk, Kwajalein and Palau, despite public Japanese assurances that these areas were not being made military-capable.

¹For the purposes of discussing the events of World War II in this chapter, the island and regional names in common use during that era are used; these names are also the most commonly used in historical records.

Data on Japan's wartime construction of merchant vessels are minimal. When the war started, photography of Japanese merchantmen ceased, and photo comparison of war-built ships was seldom, if ever, possible. Many hundreds of these standard merchant ships were, of course, lost during the war in the Central Pacific. These are only partially covered in the Joint-Army-Navy Assessment Committee (JANAC) Report, completed in 1947, listing Japanese warship and merchant losses to all causes in World War II. The ships in JANAC are not all included in the tables found in Chapter VIII because of the difficulty of tracking down hundreds of latitudes and longitudes that were not further identified as "near Truk" or "100 miles SW of Ponape" in the source documents.

When World War II began, the Central Pacific islands served as staging areas for the early expansion of the Japanese Empire to the south and as major forward naval operating bases, roles they would perform again later during the long, costly struggle for New Guinea and the Solomons. Submarine operations and long-range air patrols were a continual feature of military operations in the mandated territory. Army troops, naval landing forces and their fortifications increased steadily as the war progressed and occupied most of the islands. Yet, when these islands came under direct military assault the Central Pacific was lost in one year, from November 1943 when Tarawa was invaded to November 1944 when organized resistance on Peleliu ended.

From the Japanese standpoint, the commitment of considerable resources and military forces to the "China Incident" from 1931-1945, a course of action forced by the Imperial Japanese Army and its political supporters, led to some military neglect of other parts of the Empire, particularly the Central Pacific islands. These islands were never prepared for military operations to the degree suspected or predicted by U.S. intelligence sources. The islands certainly never received the military attention they should have, had the Imperial Navy expected any serious assault. The Japanese government's focus on China led to many oversights when the possibility of a Pacific war with one or more of the Allied powers, particularly the United States, became more of a reality. These oversights, which contributed much to the rapid loss of the Central Pacific island bases, compounded the inherent difficulty of maintaining large dispersed forces in areas of very little land.

Far more influential than Japanese preparedness for war was the evolution in the American Navy of an effective submarine force and a Fast Carrier Task Force. No Japanese, or for that matter American, naval planner of that era could have possibly predicted that the United States could deploy a 12-carrier, 8-battleship task force supporting an amphibious group capable of landing over 100,000 troops against a single target in June 1944, while at the same time supporting an even larger invasion half a world away at Normandy. The American materiel superiority in weapons and numbers is reflected in the high percentage of Japanese ships found throughout the area. The enormously effective submarine war (once torpedo defects were corrected) contributed to the majority of Japanese merchant ship losses in all areas; this is also reflected in the known shipping losses in the Central Pacific when deep waters outside island groups are considered.

Neither the number of shipwrecks nor their home country are indicative of the full valor and sacrifice experienced on both sides in defending or assaulting the islands of the Central Pacific. No Japanese-held island directly assaulted in the Pacific war ever surrendered, no white flag was ever raised from the one remaining Japanese command bunker, no ceremonial sword passed to the victor's hand. On the other side, no U.S. amphibious assault on a Pacific Island was ever unsuccessful, no assault waves thrown back into the sea. These are the facts that should be remembered, and these are the facts to which the Pacific shipwrecks of World War II bear mute testimony.

Historical Research

While conducting the historical research necessary for this chapter, it became apparent that the published records used to document the losses of Japanese shipping and aircraft do not agree. Not only do various Japanese and American accounts differ, but American records also exhibit discrepancies. This problem is well-known to historical researchers; however, this is less known to the general public and consequently requires extreme caution when conducting research on Japanese shipwrecks, particularly merchant vessels. Comprehensive research would require access to both Japanese and American source documents and cross-comparison of all published records and on-site investigations.

No attempt is made in this chapter to reconcile the discrepancies found, for example, between the Joint Army-Navy Assessment Committee (JANAC) Report of 1947, Warships of the

Imperial Japanese Navy 1869-1945, or the recently published U.S. Submarine Attacks During World War II. That type of detailed research is outside the scope and purpose of this chapter, which lists only the most well-documented Japanese and American losses of shipping, or provides representative examples of the types of engagements and sinkings that occurred during a particular Central Pacific wartime operation. This is also true for Japanese aircraft losses; considerable additional research would be necessary to identify any particular aircraft, its squadron, pilot, and base of operations.

The discrepancies, and the consequent need for detailed research in both Japanese and American historical sources to resolve them, have significant consequences for those who must manage the resource base. World War II remains in the Central Pacific are a dwindling resource, gradually decomposing as a result of the effects of the sea, and increasingly vulnerable to exploitation by technically sophisticated diving explorations and by careless sport divers seeking souvenirs. Protection, preservation and interpretation of the artifacts of World War II assume greater importance when a dwindling resource base is considered in conjunction with the many gaps in the historical record that can only be closed through more comprehensive archeological and historical analysis.

War With Japan Begins

The simultaneous attack by Japanese Naval and Army forces in the Dutch East Indies (now Indonesia), Southeast Asia and Pearl Harbor left the Imperial Navy quickly dominant in the Pacific (refer to Figure 2.1). Although the attack on Pearl Harbor was designed as a killing blow against the Pacific Fleet, it failed to destroy Pearl Harbor as a fleet facility, ultimately a disastrous oversight. It further failed to catch the American aircraft carriers in the harbor, although the carrier ENTERPRISE was less than eight hours steaming distance from Pearl and some of its aircraft returning to Ford Island the morning of December 7 were shot down.

The Japanese onslaught in Asia was rapid, ruthless and effective, defeating all engaged forces in all areas. This success engendered an attitude of defeatism, fear and helplessness in the Allied forces "at the front," who had little with which to defend themselves. The British, American and Dutch forces were quickly routed as the Japanese overran the oil and resource-rich lands. These resources were needed by Japan in order to function as a nation in the

face of the U.S.-imposed embargoes on strategic materials, a U.S. reaction to Japan's continued involvement in the war with China. While bitter battles of retreat and frustration were played out far to the west by the U.S. Asiatic Fleet and their overwhelmingly superior Japanese opponents, the Central Pacific remained a relative backwater well into 1942.

Japanese submarines scheduled to participate in the Pearl Harbor operation staged through Saipan and Kwajalein and Japanese forces (including one light carrier) assembled at Palau for the landing at Davao and the Southern Philippines. Additionally, most of the naval forces for the Wake Island assault twice sortied from Kwajalein, the Marines at Wake having stood them off the first time. Other war operations in the Central Pacific are not well documented in the English language histories of this period of the war. It is known that many naval forces staged through the area en route to other areas to the south and west and represented an increase in warship traffic over the prewar average. Steadily increasing merchant traffic in the area likely continued in the prewar pattern with the exception of military convoys en route to other destinations. Many merchant ships still proceeded independently and unarmed despite the threat of submarine attack.

Japanese forces quickly moved into the Gilbert Islands once the war began and established bases at Makin and Tarawa. Seaplane tenders and small naval forces also operated continuously in the area; they supported various naval missions and established control over outlying islands. Long-range patrols by seaplanes and land-based attack planes were a continual feature of Japanese operations, as were submarine patrols.

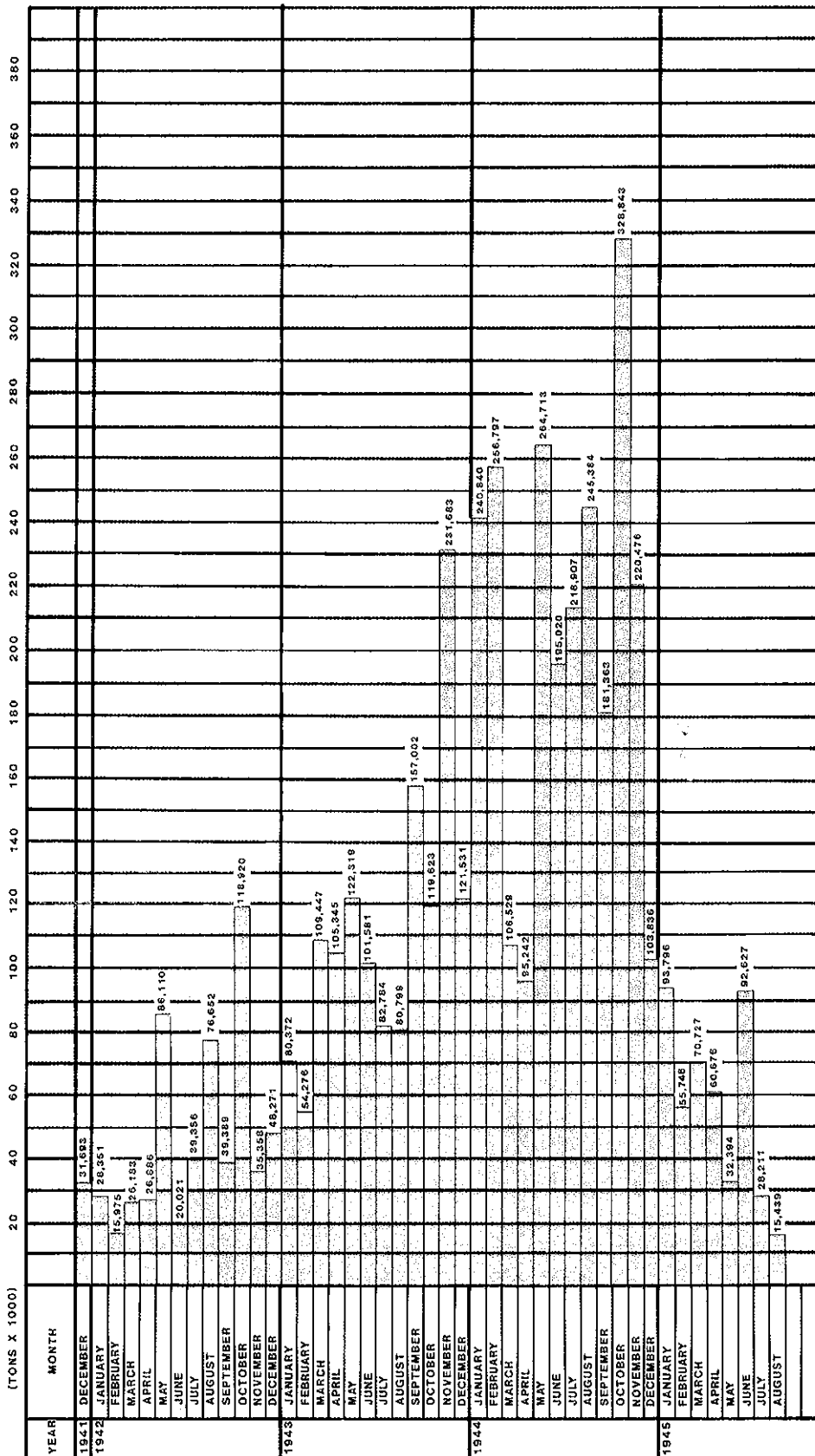
Because the Japanese had complete control over the Central Pacific, with the exception of U.S. submarine penetration, it is probable that Japanese air and ship operations can only be generally summarized. Although U.S. intelligence from radio traffic in the area is incomplete and fragmentary, the decrypts and traffic analysis might shed considerable light on the subject. This is particularly true for merchant vessels whose radio security was far easier to deal with than most naval traffic. The degree of U.S. penetration of the Japanese JN-25 naval code at this time is not well documented in any source, but this decrypted information would be useful in developing a picture of naval operations. Unfortunately, although there is an enormous collection of intelligence decrypts, usually referred to as "Ultra" intelligence in U.S. records, research to date in this collection has been directed at other aspects of the Pacific War. As far as is known, no effort has been made in wartime historical research to detail the operations of the Japanese merchant fleet

before and during the war, nor to depict naval or merchant operations in the Central Pacific early in the war.

While the Japanese consolidated their gains in the southern areas and continued the long struggle for the Philippines, the Central Pacific islands served primarily as staging bases for operations elsewhere. Japanese operations in the Philippines did not go as planned; the tenacious defense of the islands delayed the Japanese far longer than anticipated. As a result, Palau became increasingly important as a staging base for the conquest of the southern Philippines, receiving planes, ships, men and equipment from Saipan and the home islands until the fall of Corregidor.

During the first months of the war, the only U.S. naval forces capable of operating in the Central Pacific were submarines; however, their initial impact in the area was minimal. The operations in the Philippines, off Japan, in Southeast Asia, and the Dutch East Indies occupied the few submarines available. The submarine bases in Australia and Pearl Harbor were a long way from the Central Pacific, which limited their range and time on station. Coupled with insufficient numbers was the more serious issue affecting early U.S. submarine performance in all areas of the Pacific War--a horribly defective torpedo. Defects in the torpedo resulted in many misses and premature firings. To make matters worse, submarine commanders who reported such problems were not heeded. The Navy's obdurate Bureau of Ordnance even refused to test the torpedoes at first. In desperation, the Commander of Submarines in the Pacific Fleet finally conducted his own tests in 1943 and initiated field corrections. He even went so far as to use carefully sanitized Ultra intelligence information to convince doubters in the bureaucracy. The torpedo problems were not fully solved until some 21 months after the war started. Successful submarine attacks increased steadily from this point on, as can be seen by reference to Figure 6.1.

Submarines were not always effectively employed in the early stages of the war because they did not have the advantages of modern electronics, especially radar. They also suffered from too many overly cautious commanders, an outgrowth of a cautious and unrealistic peacetime training program that contrasted sharply with the training conducted by the Imperial Japanese Navy. Because of these factors, the submarine war in the Central Pacific was initially limited in effect, sinking few ships, and the submarine fleet was sometimes poorly used and directed by the commanding admirals. This situation would gradually change and the majority of Japanese ship losses in the Central Pacific would eventually be credited to submarines. Fortunately for the United States, the employment of Japanese fleet submarines



(1,152 1/2 VESSELS FOR 4,859,634 TONS)

UNREVISED FIGURES FROM USSS/JANAC, 1947

Fig. 6.1. Japanese merchant losses (500 tons only) December 1941 through August 1945 from allied submarines.

was unimaginative and poorly directed, almost removing Japan's fleet submarines from any decisive role in the war.

As the war raged to the south and west and salvage work continued to the east at Pearl Harbor, the Central Pacific remained relatively unmolested by the operations of the two powerful belligerents. The Central Pacific would remain terra incognita for U.S. forces despite continuing submarine reconnaissance; a Japanese merchantman, unarmed and unescorted, could still sail at 10 knots from Truk to Kwajalein to Saipan without a care in the world. This relative quiet would last until February 1942, when two American aircraft carriers would pay a visit to the Central Pacific.

First Strikes in the Pacific

Gilbert and Marshall Islands Raids, February 1942

Adm. Chester Nimitz, Commander-in-Chief, Pacific Fleet (CINCPAC), intended to use U.S. carrier strength to hit enemy island bases because he saw this strategy as the best chance of blunting the Japanese expansion into the South Pacific and the best use of available forces. The fast raids would provide a sorely needed morale boost for the American public and the Navy. They would also provide combat experience for the as-yet unbloodied airmen, which did not risk too much, and would, hopefully, protect American supply lines to Australia through Samoa.

The carriers ENTERPRISE, under Adm. William F. Halsey (Task Force 8), and YORKTOWN, under Adm. Frank J. Fletcher (Task Force 17), escorted a troop convoy to Samoa and then departed January 25, 1942, to hit bases in the Gilberts and Marshalls. The attacks scheduled for February 1 were targeted on Kwajalein, Maloelap and Wotje in the Marshalls, ENTERPRISE's targets, and Makin and other bases in the Gilberts, YORKTOWN's targets. Escorting the carriers were the heavy cruisers LOUISVILLE, CHESTER, NORTHAMPTON and SALT LAKE CITY with the light cruiser ST. LOUIS. All the cruisers were scheduled to bombard the islands.

Japanese air defense for the region was reported as "...a portion of Rear Admiral Toto Eiji's 24th Air Flotilla [koku sentai]..." (Lundstrom 1984:76). This consisted of 33 carrier fighters, 9 land attack planes and 9 flying boats from the CHITOSE and YOKOHAMA air groups. American reports indicated seeing more aircraft than this, particularly at Tarawa. In any case, these naval air forces were the only attack forces in the area other than submarines; no heavy naval units were

in the vicinity. Apparently, the Marshall and Gilbert islands were low on the Japanese aircraft priority list because most of the aircraft were not first-line types. They consisted of mostly G3M2 type 96 land attack planes, code named Nell by U.S. forces, A5M4 carrier fighters, code named Claude, and Kawanishi H6K4 type 97 flying boats, code named Mavis. Considering that this eastern extremity of the Pacific territory held by the Japanese was in direct confrontation with the U.S. Pacific Fleet, the relatively weak defensive forces using "second string" aircraft are indicative of the overall lack of realistic planning and preparation for war on the part of the senior military command. Expansion into Southeast Asia, China and the Dutch East Indies absorbed tremendous air and surface forces as well as merchant traffic. This undoubtedly contributed to the limited naval offensive materiel in the Marshall and Gilbert islands. The two attacking carriers approaching for the first offensive Pacific Fleet action in late January 1942 were themselves testimony to the slim resources of the United States at the same time, although two heavy carriers were certainly more utilitarian offensive weapons than the outlying Japanese islands in the Central Pacific, as would be clearly demonstrated.

Admiral Halsey, in overall command, positioned ENTERPRISE in the midst of the targets in the Marshalls and launched the first strike in the predawn hours of February 1, 1942. All of ENTERPRISE's dive and torpedo bombers (SBD Dauntless and TBD Devastators) were fully occupied with Kwajalein, so fighters (F4F Wildcats) were used for the initial strikes on Wotje and Tarawa. This deployment strategy would quickly change because Tarawa had a first-class airfield and was, in fact, one of the major bases in the Central Pacific. Wotje was also bombarded by two cruisers and a destroyer under Adm. Raymond Spruance, while Tarawa was bombarded by the cruiser CHESTER and two destroyers.

ENTERPRISE's initial launch consisted of 37 SBD Dauntless dive bombers, 9 TBD Devastator torpedo planes and 6 F4F Wildcat fighters. With the initial attack on Roi, Comdr. Hallsted Hopping, Squadron Leader of VS-6, dropped the first bomb of World War II to land on Japanese soil. Shortly thereafter, Hopping's SBD crashed in the ocean, a victim of heavy anti-aircraft fire. This began the Central Pacific island's long association with an aircraft carrier named ENTERPRISE. Strikes were carried out until one o'clock in the afternoon, concentrating on Tarawa with its heavily developed airfield. Torpedo and bombing attacks were carried out against the merchantmen, patrol vessels and auxiliaries found around the islands, but no clear accounting of exactly the number of ships sunk or damaged emerges from published English sources. It is certain ships were sunk, but it is

not known if any were salvaged, either by the Japanese before the islands were invaded or later by American forces. Considerable damage was done by air and surface bombardment to all the bases attacked and many aircraft were destroyed. American reports claimed one light cruiser and one submarine damaged along with at least seven merchantmen and auxiliaries.

Incomplete or inaccurate information about Japanese shipping or aircraft losses was not an uncommon problem, particularly in early war actions and in war accounts published shortly after the fact for two reasons--little was known of Japanese ships in general, and the nature of aerial combat in enemy territory does not lend itself to long meditative appraisals of ships, particularly ships shooting back with heavy-caliber weapons. Known Japanese losses during the raid against the Gilberts and Marshalls include the auxiliary netlayer KASHIMA MARU, transport BORDEAUX MARU, auxiliary submarine chaser SHONAN MARU NO. 10, and gunboat TOYOTSU MARU, all victims of ENTERPRISE aircraft.

As ENTERPRISE and its escorts withdrew, five Nells attacked the force. Fifteen bombs in all were dropped, the closest 30 feet off the port quarter of ENTERPRISE, causing minor damage and killing one man. ENTERPRISE was also near-missed by a fatally damaged Nell attempting to crash onboard--a tactic that would later become all too familiar to the Pacific Fleet. Several other Japanese aircraft were reported shot down in these engagements, mostly A5M Claudes and H6K Mavis seaplanes.

Simultaneously to the south, YORKTOWN launched attacks against Makin, Jaluit and Mili, which consisted initially of 17 SBDs and 11 bomb-armed TBD Devastator torpedo planes along with covering F4F Wildcat fighters. Mili was barren of worthwhile targets, but facilities and small auxiliary vessels at Jaluit and Makin were attacked. Poor weather seriously hampered effective coordinated attacks and resulted in additional U.S. aircraft losses. Worsening weather prevented further attacks, and YORKTOWN withdrew to join ENTERPRISE for the return to Pearl Harbor.

By February 6, 1942, both carriers were back in Pearl, having successfully conducted the first offensive strike of the Pacific Fleet with minimal losses of F4F Wildcats, SBD Dauntlesses and TBD Devastators. Although damage to the Japanese-held islands and shipping was less than claimed at the time and much was salvaged or repaired, the effectiveness of the Japanese air arm in the Marshalls and Gilberts was severely reduced until replacement men and materiel could be sent in. The U.S. Navy also learned valuable lessons in operating its carriers and air groups at minimum risk, which

would pay off in future operations. Finally, the Japanese were served notice that they were no longer alone in the Central Pacific; there would soon be further hit-and-run raids.

Wake and Marcus Raids, February-March 1942

On February 14, 1942, the carrier ENTERPRISE left Pearl Harbor with the cruisers NORTHAMPTON and SALT LAKE CITY and seven destroyers bound for strikes on Wake. Wake had been captured by the Japanese on December 23, 1941, after their initial attack had been repulsed by defending Marines. The carrier LEXINGTON was occupied in an abortive attack on Rabaul, and YORKTOWN was being held in reserve, so this hit-and-run raid would pit a single carrier against two widely separated targets, both possessing heavy land-based aircraft defenses. Admiral Halsey was again in command.

The strategy used during the air attack for Wake was similar to that on the Marshalls and Gilberts. First, the heavy cruisers bombarded Wake, approaching from the northwest. Then ENTERPRISE's 52-plane group, consisting of 37 SBD dive bombers, 9 TBD torpedo bombers and 6 F4F fighters were launched 100 miles north of Wake. The attack commenced about 7:50 a.m., February 24; there was no airborne aircraft opposition and the island was heavily bombed with much damage to facilities, fuel storage and aircraft. Several small Japanese auxiliary craft were reported sunk in the vicinity.

Again, precise information on vessels and aircraft down in the area is scanty, ENTERPRISE claiming one small patrol craft and three four-engine Mavis flying boats destroyed (two on the ground) in addition to damage to the island's structures and runways. Two small auxiliary patrol boats were also claimed as destroyed by aircraft and destroyers MAURY and BALCH.

On February 25, as ENTERPRISE was steaming to a fueling rendezvous, CINCPAC ordered Halsey to attack Marcus Island some 650 miles west of Wake and only 1,000 miles from Tokyo. ENTERPRISE, accompanied by only two cruiser escorts, launched a 38-plane attack group in the predawn light of March 4, 1942. ENTERPRISE's radar officer was able to track the attack inbound and provided course corrections for the strike leader, the first instance of radar assistance in a carrier-based attack.

Commencing their attack about 6:30 a.m. and catching the defenders by surprise, the 32 dive bombers worked over Marcus with its three triangular runways. There was no shipping reported damaged or sunk in this engagement, but shore-based

facilities and aircraft on the ground were severely damaged. Completing this single attack before noon, ENTERPRISE turned for Pearl Harbor, performing the classic naval maneuver known as "hauling out with Halsey." Published sources are not clear on the types of aircraft surprised on the ground by this attack and destroyed. Presumably these included the usual first-line naval fighter and bomber aircraft of the period and reconnaissance types as well.

ENTERPRISE returned to Pearl Harbor on March 10, 1942. ENTERPRISE's lone raid deep into enemy territory, while accompanied by only two cruisers, demonstrated the efficacy of the basic tactic being advocated by air-minded admirals in the Pacific Fleet against a still-conservative surface-minded Navy--the long-range, hit-and-run strategy. Some obvious deficiencies existed, in particular close escort for the carriers and more fighter aircraft to escort attacking planes and defend the carriers. But, overall, the concept was proven in the raids on the Marshalls, Gilberts, Wake and Marcus. Aircraft and men were lost operationally and in combat, but the carriers emerged intact.

On the Japanese side, base capabilities were reduced, airpower was curtailed and it was obvious that all of these island areas were vulnerable to attack unless sufficient naval and air forces were allocated. Naturally, bases were rebuilt and reinforced where possible, but there was little available to commit to the Central Pacific. The needs of the Japanese military in the South Pacific, Southeast Asia and China limited what could be accomplished elsewhere, especially as considerable forces were still committed to the struggle for the Philippines.

The existing timetable for Japanese expansion further into the Pacific, New Guinea and the Solomons was disrupted by these carrier raids. This delay would pay off in May 1942 when aircraft carriers would square off against each other for the first time, initiating the naval campaign for the Solomons and New Guinea.

A period of relative quiet ensued in the Central Pacific after the February carrier raids, while issues elsewhere occupied the Naval forces of Japan and the United States and Douglas MacArthur's embryonic campaign in New Guinea. The Japanese would soon meet the U.S. Marine Corps, and aircraft carriers would settle once and for all the question of the dominant naval force in the Pacific; when the ENTERPRISE returned to the Central Pacific in 1943, it would not be alone.

Second Phase of Operations in the Pacific

The early operations of the Japanese military juggernaut succeeded beyond even the expectations of the most optimistic Japanese military commanders, with the exception of the Philippines where it was apparent that a long, bitter and bloody battle was going to occur before the Americans could be ousted. The battle in the Philippines would eventually upset the Japanese timetable of future operations and would occupy military forces and equipment needed in other areas. Whatever else might be said about the American sacrifices in Manila, Cavite, Bataan and Corregidor, they were a key element in eventual victory despite the bitterness of defeat.

Bolstered by continual success and the inability of Allied forces to strike any effective counterblows, Japanese naval and army forces began the second stage of Japan's expansion into the Pacific by occupying Kavieng on New Ireland and Rabaul on New Britain in January-February 1942 (refer to Figure 2.1). Occupation and development of these two bases was supported by naval and merchant forces routed from Japan through Saipan and then Palau or Truk.

Palau, Saipan and especially Truk became major forward operating bases for units of the Japanese Combined Fleet, with the smaller Caroline and Marshall bases primarily occupied with air reconnaissance and submarine operations and serving as routing bases for aircraft and the ever-increasing merchant and naval auxiliary traffic. Because of the Japanese control of air and sea around the Central Pacific islands and these islands' relative isolation from the areas Japan selected for the "front lines," the bases were nearly immune to any form of decisive attack, considering that the U.S. did not have the resources available to make such an attack. Isolated carrier raids, primarily morale and experience builders, and submarine attack were the only practical offensive operations that the U.S. could and did mount in this area.

Submarines would continue to cause shipping losses in the Central Pacific throughout the war or until these areas were secured by U.S. forces. However, it should be pointed out that despite the difficulties faced by the "silent service"

during the first years of the war, around 600,000 tons of shipping were eventually credited to submarines by JANAC² for the period December 1941-December 1942 (refer to Figure 6.1). This tonnage figure does not include ships damaged and laid up for repairs, also a service drain on Japan's thin merchant resources. Losses to submarines in the early part of the war would have considerable effect on the ability of Japan's military to move men and equipment farther into the Pacific, particularly as these operations were not the main focus of Japanese efforts.

Occupation of Kavieng on New Ireland and Rabaul on New Britain provided well-harbored forward bases for further Japanese plans in the South Pacific--occupation of New Guinea and the Solomon Islands. The occupation of these areas was a prelude to operations aimed at cutting the Fiji-Samoa lifeline between the U.S. and Australia. A plan for invasion of Australia was dropped, primarily because the Japanese Army recognized that such a move was beyond the capability of Japanese resources. Rabaul and Kavieng were both heavily developed offensively and defensively by the Japanese Army and Navy. Rabaul became one of Japan's most heavily-defended bases, surrounded by air bases, antiaircraft and ship defenses, and would remain a thorn in Admiral Nimitz' and General MacArthur's sides until 1944. Even then it was still strong enough to be bypassed by Allied invasion forces in favor of less well-defended areas that could be used to keep Rabaul neutralized.

Japanese forces, deploying from the Rabaul-Kavieng area, landed troops on March 9, 1942, at Lae and Salamau on New Guinea's north coast. This was the first step in the planned occupation of New Guinea that was aimed at the Allied base at Port Moresby on New Guinea's south coast. For the first time, the Japanese landing met with stiff resistance from U.S. forces, although the landings and occupation were not stopped. On the morning of March 10, 1942, the carrier LEXINGTON, under Rear Adm. Wilson Brown, and the carrier YORKTOWN, under Admiral Fletcher, launched fighters, torpedo bombers and dive bombers north over the imposing Owen Stanley Mountains of New Guinea. These aircraft caught Japanese forces in both Lae and Salamau by surprise. Postwar accounts credit aircraft from LEXINGTON and YORKTOWN with sinking

²JANAC, though obviously inaccurate, is the only set of documented statistics currently available some 40 years after the fact, although new information such as that found in U.S. Submarine Attacks during World War II is now starting to emerge.

three transports, KONGO MARU, TENYO MARU and YOKOHAMA MARU (later salvaged), with varying degrees of damage to KOKAI MARU, seaplane tender KIYOKAWA MARU, light cruiser YUBARI, minelayer TSUGARU and destroyers ASANAGI and YUNAGI, and Japanese casualties of 130 killed and 245 wounded (Lundstrom 1984:150-168). This attack "... inflicted on the Imperial Navy by far its heaviest losses since the outbreak of the war..." (Lundstrom 1984:163). Further, the damage to Japanese forces clearly indicated to Japanese commanders the need for adequate air support for further operations in New Guinea that could initially only be provided by aircraft carriers. These carriers were not immediately available because Japan's six big carriers of the "Kido Butai" (striking force) were occupied sweeping the Indian Ocean, netting over 100,000 tons of merchant and naval shipping and pushing the British Far Eastern Fleet back to Madagascar.

Essentially, lack of air support forced Vice Admiral Inouye, in overall command of operations in New Guinea and the Solomons, to postpone for a month the scheduled capture of Port Moresby and Tulagi, a small island directly across the sound from Guadalcanal in the Solomons. Upon completion of the Indian Ocean raid, the Kido Butai returned to Japan for much needed rest and repairs. The carriers SHOKAKU and ZUIKAKU (Carrier Division 5) were detached and sent to Truk with supporting forces in response to Admiral Inouye's request for carrier support.

For the first time in the war, Truk saw a portion of the Japanese Combined Fleet's elite striking force anchored within its enormous lagoon. The presence of SHOKAKU and ZUIKAKU signified a change in the Pacific strategies. Large naval striking forces would now be deployed by both sides whenever the Japanese attempted further expansion in the Pacific. This situation arose when further expansion by the Japanese south and east in the Pacific severely strained the capability of land-based airpower to effectively cover these moves. Up to this point, the Japanese advances had been well covered by land- and sea-based airpower within their effective operational ranges. Seaborne merchant traffic was also a beneficiary of this air cover. Beginning with the New Guinea campaign, however, there were insufficient highly trained, land-based air forces available to concentrate at the point of attack. This contributed to the disruption of Japanese plans and set the stage for the first carrier vs. carrier battle of the war. Later, the Japanese occupation of Tulagi and nearby Guadalcanal would prove fatal because their distance from Rabaul's land-based air power was sufficient to cause an unacceptably high combat attrition rate--exactly the type of war situation the Japanese could not afford.

By April 1942, forces of both sides were poised but not yet committed to decisive action. U.S. naval forces, though slim in comparison to Japanese naval presence in the South Pacific, were far more effectively deployed and utilized than their Japanese counterparts because of the absolutely priceless advantage of Ultra decryptations. U.S. penetration of the Japanese JN-25 naval code was still only partial, but good use was made of this information by the commanders in charge, particularly Admiral Nimitz. He was assisted by his intelligence chief, Edwin T. Layton, and probably the most effective U.S. code-breaking team ever assembled--Fleet Radio Unit, Pacific. But before the forces gathered around Truk, Rabaul, Pearl Harbor and New Caledonia could engage, two American aircraft carriers on a lonely north Pacific trajectory would further derange Japanese plans for conquest.

Early in 1942 the sound of American submarine torpedo explosions continued in gradually increasing numbers in the Central Pacific. Already shipping losses in the Pacific area were raising eyebrows among those monitoring the pulse of Japan's wartime economy. Unfortunately for Japan's war effort, the military high command had its eyes focused on conquests in China, Southeast Asia and the Pacific. They were not interested in the statistics of economists whose graphs were beginning to reveal the constant interplay of merchant tonnage constructed versus combat losses and of oil and bulk commodities imported versus cargoes lost. The picture was already not good, "...the balance of shipping available to Japan began to decline as early as April 1942...." (The War Against Japanese Transportation, U.S. Strategic Bombing Survey, 1947).

The Doolittle Raid, April 1942

The raid on Tokyo and other targets by Col. James Doolittle's B-25 medium bombers, launched from carrier HORNET some 600 miles from Tokyo on April 18, 1942, was an unqualified success in terms of embarrassing the higher echelons of the Japanese military hierarchy, although material damage caused by the Tokyo raiders was minimal. HORNET, covered by its sister ship ENTERPRISE, both under the command of Admiral Halsey, had been detected inbound by Japanese picket ships. The Japanese, expecting an attack by carrier aircraft of conventional range rather than longer-ranged medium bombers, miscalculated their response exactly as U.S. planners had hoped, and Doolittle's attacking forces escaped to China and the USSR, where their real troubles began. HORNET and ENTERPRISE also escaped untouched, returning to Pearl Harbor. They were almost immediately redeployed to the South Pacific in the hope they could support forces engaged in the Coral Sea but arrived 24 hours late for the battle. Coral

Sea would be the only major carrier engagement ENTERPRISE would miss during the entire war.

Doolittle's raid was an enormous morale boost for the hard-pressed American forces in the Pacific and on the home front. Its greatest immediate benefits were a thorough shake-up of Japanese complacency about the war effort, with subsequent hurried and ill-conceived plans and priorities by the military, coupled with an Ultra intelligence windfall for U.S. intelligence groups. The tremendous increase in Japanese naval messages, all obviously concerning the Doolittle raid, brought additional decryption and traffic analysis gains for the Pacific Fleet's intelligence units, information and decryptions that contributed considerably to U.S. knowledge of future Japanese operations and, most importantly, a timetable for those operations. The close cooperation developing between intelligence units and the U.S. submarine service would also result in an ever-increasing number of sinkings in all ocean areas, all attributable in one way or another to Ultra. A sinking off Palau, a transport down near Truk, damage to a destroyer near Jaluit, a wrecked tanker under tow to Saipan--all these types of incidents contributed to the increasing difficulty of supplying and maintaining the Japanese advance into the Pacific. Although no statistical analysis has been published to date, several historical sources indicate at least 55 percent of all submarine sinkings benefitted from information provided by Ultra.

Battle of the Coral Sea, May 1942

Further benefits accrued to the the U.S. from the Doolittle Raid because Japanese naval planners finally solidified their plans. Adm. Isoroku Yamamoto's proposal for an attack on Midway, ostensibly to secure the last gap in Japan's front lines and hopefully to draw the remainder of the U.S. fleet (particularly the carriers) into decisive defeat, was accepted by the naval staff. There were good reasons not to engage in the Midway Operation, many of them brought up by informed Japanese naval staff officers in conferences during April-May 1942. However, the serious loss of face incurred from the Doolittle raid effectively silenced opposition. There was also a strong feeling among the Japanese naval staff against interfering with the plans of Admiral Yamamoto who, as Commander-in-Chief of the Combined Fleet, had been brilliantly successful in every naval operation so far. This reliance on Admiral Yamamoto was, in part, a manifestation of the "victory disease" with which the Japanese were infected at this period. (The term was coined by the Japanese themselves in their postwar analyses.)

Reflecting revised Japanese plans, the carrier task forces and other Combined Fleet units repaired, trained and prepared for the upcoming Midway Operation. Meanwhile, Admiral Inouye was ordered to commence further operations directed at occupying Milne Bay and Port Moresby in New Guinea in early May. Carriers SHOKAKU and ZUIKAKU, as well as the small converted carrier SHOHO, would directly support this amphibious assault planned for Port Moresby and also protect the Japanese flank at Tulagi in the Solomon Island chain southeast of New Guinea.

By the end of April 1942, all the Japanese forces staging from the home islands through Saipan, Palau and Truk to Rabaul and Kavieng were assembled. For Port Moresby, the invasion force (in three parts) was commanded by Rear Adm. Aritomo Goto and consisted of a main force of four heavy cruisers, a destroyer and the light carrier SHOHO; an invasion force of transports and auxiliaries and a support group of a seaplane carrier and light cruisers. A further small group of transports and destroyers was assigned to capture Tulagi for eventual use as a seaplane base. Admiral Takagi's striking force of SHOKAKU and ZUIKAKU, supported by cruisers and destroyers, were deployed to cover and support these invasion forces. This splitting of forces on the part of the Japanese Navy was characteristic of major operations by them throughout the war, often with disastrous results.

Pacific Fleet Headquarters was well enough informed of Japanese intentions through radio traffic analysis and decryptations to deploy the carriers YORKTOWN and LEXINGTON to the Coral Sea (refer to Figure 2.1). Action commenced on May 3, 1942, when aircraft from YORKTOWN struck the small Tulagi invasion force and sunk an old destroyer, two small patrol craft, and a transport and damaged other ships. The two big Japanese carriers were out of position, delayed due to refueling, and could not support the Tulagi force, the remnants of which returned to Rabaul. On May 7, acting on poor reconnaissance information, carriers SHOKAKU and ZUIKAKU did succeed in sinking the U.S. fleet oiler NEOSHO and destroyer SIMS, while Admiral Fletcher, victimized by equally poor reconnaissance data, got lucky and found carrier SHOHO the same day. SHOHO was promptly sunk by planes from LEXINGTON and YORKTOWN, the first Japanese carrier loss of the war.

Following the sparring on May 7, 1942, both carrier forces found each other on May 8. Planes from the American carriers succeeded in putting several 1,000-pound bombs on SHOKAKU, knocking it out but not sinking it. ZUIKAKU was not damaged, but its air groups were decimated and it too was rendered ineffective. YORKTOWN was seriously damaged by a bomb, and LEXINGTON took two torpedoes and a bomb, resulting in its

eventual loss when ruptured fuel tanks ignited, causing uncontrollable fires. LEXINGTON was abandoned and scuttled late in the afternoon of May 8. LEXINGTON was America's first aircraft carrier loss of the war.

Tactically, the victory went to the Japanese at the Coral Sea in terms of tonnage sunk. Strategically, the Japanese Port Moresby invasion was stopped cold and the invasion transports forced to turn around and return to Rabaul during the carrier battle. This was the first time a Japanese amphibious assault was stopped. Coming hard on the heels of the surrender of Corregidor, the Coral Sea battle was a clearcut American victory and a great morale booster for the American public. In addition to gaining time for hard-pressed U.S. forces in the Pacific, further intelligence gains from the Coral Sea would pay huge dividends in the next naval battle.

U.S. forces withdrew from the Coral Sea to Pearl Harbor following the battle. The Japanese were in no position to take advantage of the U.S. absence, however, because of lack of carrier air cover and the demands of the upcoming Midway operation. While Japanese naval and army operations in the New Guinea-Bismarck-Solomons area regrouped from the stinging defeat, the Combined Fleet, minus two sorely needed carriers, began its deployment for Midway. Prevented from further gains in New Guinea, stalled in Tulagi and about to start an airfield on Guadalcanal, the Japanese would await the outcome of the Midway operation before continuing their conquest of the South Pacific.

Battle of Midway, June 1942

The battle of Midway, like that of the Coral Sea, did not have a direct impact on the Marshall, Caroline, Gilbert and Mariana islands. However, the outcome of these battles did affect the ability of the U.S. to pursue a strategy of attrition warfare and make steady progress across the Pacific. The significance of both the battle of the Coral Sea and Midway (the latter considered a major turning point of the war) to the eventual outcome of the Pacific War cannot be overstated. Midway was to serve as another mid-ocean base for Japanese expansion and as a jump-off point for attacks against Johnston Island and Hawaii (refer to Figure 2.1).

The Japanese attack on Midway occupied almost the entire strength of the Combined Fleet, again scattered across the Pacific in several task groups. As a diversion, two light carriers and occupation forces were dispatched to the Aleutians to occupy Attu and Kiska and to attack Dutch Harbor as well. This force was essentially ignored by the U.S. Navy and played no significant part in the conflict at Midway.

Deployed against Midway were the "Kido Butai" with four carriers, AKAGI, KAGA, HIRYU and SORYU, and their supporting forces. These fast carriers approached from the northwest and were followed at a distance by the Combined Fleet's battleships, including Admiral Yamamoto on the fleet flagship YAMATO. The invasion transports for Midway, accompanied by support bombardment forces, came from Central Pacific bases to the southwest.

Against these forces, Admiral Nimitz deployed only the three sister carriers ENTERPRISE, a veteran; HORNET, a new carrier with an untried air group; and YORKTOWN, also a veteran but only partially repaired from its Coral Sea damage. With their supporting cruisers and destroyers, this small group represented America's "first team" in the Pacific--the men and materiel available and on the front lines when the war began before U.S. production capability made any difference in the war effort. Under command of Admirals Spruance (replacing the ill Halsey) and Fletcher, the three carriers appeared inadequate for the task of holding off the most powerful invasion armada deployed so far in the Pacific War.

Fortunately for U.S. forces, Admiral Nimitz not only had superb intelligence on Japanese intentions, including most of their battle plan, but he acted immediately and decisively on these intelligence decrypts in the face of conflicting information from other intelligence sources. Decisively deployed and brilliantly employed, ENTERPRISE, YORKTOWN and HORNET destroyed the Japanese carrier force on June 4, 1942, mortally damaging AKAGI, KAGA and SORYU within five minutes and scoring on HIRYU later in the day. The loss of these ships was followed by the sinking of one heavy cruiser (MIKUMA) and damage to another the next day. On the U.S. side, the carrier YORKTOWN was lost to aerial bombs and submarine torpedoes and the destroyer HAMMANN was sunk by a torpedo.

Following the carrier battle of June 4, 1942, the remaining Japanese forces retreated in disarray, with the exception of those forces that succeeded in "capturing" undefended Attu and Kiska, where they immediately became more of a liability to the Japanese than a forward bastion. For the U.S., elimination of four of the six carriers of Japan's only true carrier task force took enormous pressure off the only American carriers available in the Pacific, ENTERPRISE, HORNET and SARATOGA.

The strategic effect of the American victory was immediate and enormous, although the Japanese refused to recognize the Battle of Midway as a strategic defeat at the time. Without an effective fast carrier force, all Japanese front line areas were now far more vulnerable to attack by American

naval and amphibious units unless additional air power could be provided in great numbers. One of the legs supporting Japanese plans for expansion across the Pacific had been the ability to deploy large numbers of carrier aircraft to any threatened point. With four carriers sunk and no large carrier construction program in the works, further Japanese operations were now in serious jeopardy whether the Japanese recognized it or not. SHOKAKU and ZUIKAKU, still in Japan under repair from the Coral Sea battle, plus the few carriers under construction, would not be sufficient to support either offense or defense for any length of time. The men of SHOKAKU and ZUIKAKU would take a tremendous beating over the next two years proving just that point.

Stripped of the potential support of the fast carriers, the Central Pacific islands were now vulnerable to the same type of carrier attack originally considered a bulwark of their defense. Fortunately for Japanese forces, the U.S. was in no position to immediately exploit this advantage, although political and military events would conspire to make the South Pacific once again the focus of the main war effort by both combatants.

New Guinea and Guadalcanal, July-August 1942

The political and military situation faced by the U.S. and its Allies fighting a war on two fronts was still grim in mid-1942. Despite the agreement by the major Allied powers on a war philosophy of "Germany first" and the pleas of the USSR for a second front in Europe, it was obvious to American war planners that offensive action in the Pacific would be required to ensure at least the containing of the Japanese and preventing the loss of the vital lifelines to Australia. This created competition for war resources among the military commands involved in Europe and the Pacific. Because of American commitments to North African operations and related actions in the Mediterranean, MacArthur's campaign in New Guinea and the Naval and Marine Corps operations in the Solomons under Vice Adm. Robert Ghormley, and later Admiral Halsey, would suffer from shortages of personnel and equipment. This would often put the war effort in extreme peril in the Pacific and would extract an enormous toll from American and Allied forces.

For the Japanese, who by July 1942 were once again ready to commit troops to the New Guinea front, the Central Pacific islands would now receive their most intense period of military and merchant traffic. All Japanese Army and Navy military forces to be used in New Guinea had to stage through Saipan, the Philippines, Palau, Truk, Kwajalein and other islands en route to Rabaul and eventual deployment either in

northern New Guinea or, later, in the Solomons (refer to Figure 2.1). The staging of troops again emphasized to the Japanese the importance of the geographic locations of these island bases. Depredations by American submarines were a constant factor throughout this phase of the war. Beginning with the Guadalcanal campaign, submarine operations in the Central Pacific intensified with better results. On the Japanese side, more merchant ships were armed, the beginnings of a convoy system were established, and Japanese antisubmarine resources (never adequate during the war) were increased throughout the Central Pacific islands and the Northern Marianas. Enormous numbers of ships and aircraft would pass through the Central Pacific en route to combat areas and many would not return. Repair facilities in these areas began to do a land office business. Truk was heavily involved in ship repair work in 1942-1943 as damaged ships from Guadalcanal, Rabaul and New Guinea arrived from the south.

The Japanese invasion of New Guinea began again on July 21, 1942, when Lt. Gen. Tomitaro Horii's 16,000-man elite South Seas detachment landed at Buna. Instead of an amphibious assault on Port Moresby, this time the Japanese intended to march over the 13,000-foot Owen Stanley Mountains and capture Port Moresby from the north. Apparently the climatic and environmental conditions in these jungle-covered mountains were not a factor in Japanese plans, but the jungle and diseases would be more relentless enemies than those who had guns and bombs. As it was for the Japanese, so it was for the allied Australian, New Zealand, British and American forces who would bear the brunt of the New Guinea fighting under General MacArthur's command.

Australian troops fought a bitter retreating engagement over the Owen Stanleys along the Kokoda Trail against advancing Japanese troops. The Japanese were barely contained, finally accepting defeat only when about 30 miles from Port Moresby. During the same time, a second amphibious assault was attempted by the Japanese at Milne Bay, at the eastern end of New Guinea. This attempt was repulsed by Australian troops and American combat engineers. The attempt to capture New Guinea in one decisive action had again failed; the Japanese were then committed to an attrition battle for New Guinea, pouring men and resources into the north coast of the island by barge, destroyer and freighter. Although the Imperial Army would continue to seek the conquest of New Guinea, another land battle would soon occupy almost all the men and materials originally planned for the Papau front. Despite this, Allied forces would pursue the Japanese in the jungles of New Guinea well into 1945.

Before the end of June 1942, the Japanese, consolidating their slim hold on the Solomon Islands at Tulagi, brought in labor troops, engineers and construction equipment to Guadalcanal in order to begin the construction of an airfield. When the 13-ship convoy completed its deliveries at Guadalcanal and steamed out of the sound, Japan had occupied the last piece of territory in the Pacific it would hold. Because of its distance from major land-based air power at Rabaul and because American response to the air-base construction was relatively quick, Guadalcanal immediately became a liability to the Japanese, particularly as the Japanese Army had not prepared intermediate airfields in the Solomons chain before starting on Guadalcanal.

On August 7, 1942, 11,000 Marines of the 1st Division reinforced landed on Guadalcanal and Tulagi, occupied the airfield and eliminated stubborn Japanese resistance by Tulagi by the end of the next day. This began the next longest sustained battle in American history, the six-month struggle for Guadalcanal. Although it is far too complex to cover in a general overview of this type, Admiral Morison's preface to Volume five of his History of U.S. Naval Operations in World War II succinctly summarizes the campaign:

.....the United States Navy fought six major engagements in waters adjacent to Guadalcanal, more bitter and bloody than any naval battle in American history since 1814. Four of them were night gunfire actions of a kind that we may never see again; two were carrier-air battles of the pattern set at Coral Sea; all are highly interesting and significant in the history of war. In addition, there were a score of naval actions involving destroyers and motor torpedo boats which never attained the dignity of names; fights almost daily between the Imperial Japanese Air Force and American fliers; some thirty occasions when land-based airplanes attacked ships; a fair number of submarine battles; and almost continual ground fighting by United States Marines and Army against Japanese troops, including the Battles of the Tenaru River, the Matanikau River, the Bloody Ridge, Henderson Field, Point Cruz, the Gifu and the Galloping Horse, which are worthy to figure in any military history. The Guadalcanal campaign is unique for

variety and multiplicity of weapons employed and for coordination between sea power, ground power and air power. And certainly no campaign in modern history is more fraught with ferocity and misery; none has blazed more brightly with heroism and self-sacrifice [Morison 1951(V):nbn].

Despite the best efforts of Imperial Army and Navy units to recapture Guadalcanal, they were never able to do so, losing thousands of men and hundreds of ships and aircraft in the attempt. Faced with increasing problems in New Guinea from General MacArthur's ever more successful Allied armies, defeat in Guadalcanal, and an increasingly successful submarine campaign, the Imperial Army effort collapsed; its ambitious plans for conquest turning more and more to plans for retreat and defense after January of 1943.

With Guadalcanal secure and victories in New Guinea, American forces were poised to advance up the Solomons and recapture all of Northern New Guinea, eventually planning to recapture Rabaul. This two-pronged offense under MacArthur in the Southwest Pacific and Admiral Halsey in the South Pacific would occupy most of 1943. With a steady increase in ships, men and materiel available, and guided by intelligence information, the U.S. was able to by-pass strongpoints and occupy less well-defended areas. American forces were eventually able to break the Bismarcks Barrier, leap over Rabaul and occupy the Admiralty Islands as well as recapture most of New Guinea by 1944, which poised American forces in the South Pacific on the route back to the Philippines.

These long, desperate, naval and land actions stretching from Guadalcanal to Manus and northwestern New Guinea were not the only actions pressed against the Japanese. In mid-1943, the operations that would retake the Central Pacific commenced. Japan had been unable to defend itself from the two-pronged attack through New Guinea and the Solomons; in 1943 there would be a third prong.

Central Pacific Offensive

The American decision to begin an offensive in the Central Pacific had, like all Pacific battles, a political and a military rationale. On the military side, the campaign in New Guinea was now obviously controllable and winnable, and it was also obvious from intelligence sources that the Japanese Army and Navy were in dire straits as a result of the enormous attrition of men and resources. Additionally,

the new, fast carriers were beginning to show up in the Pacific--both ESSEX-class fleet carriers and the less capable but equally fast INDEPENDENCE-class light carriers. These ships and their supporting warships were powerful but untried. The carrier admirals waged a vociferous campaign to get these new weapons into action.

Politically, the invasion of the Central Pacific was critical to the Navy. If the Navy did not maintain offensive action somewhere, it risked having its forces subordinated to MacArthur's campaign in the southwest Pacific, something the Navy was unwilling to do. The Navy did not view tying its aircraft carriers to a long-term land campaign in close proximity to enemy air bases in a good light, nor did it trust General MacArthur whose enormous ego was always getting in the way of brilliant leadership. The Central Pacific campaign had so many advantages from the strategic view that it was not difficult for Adm. Ernest King, Chief of Naval Operations, to get it approved by the Joint Chiefs of Staff. Navy-controlled operations in the Central Pacific also neatly sidestepped the issue of overall command of American forces in the Pacific. Much more importantly, it provided a means of maintaining a three-pronged attack on the Japanese to which they could not adequately respond with the military resources available.

During the long campaign for the South Pacific, the Japanese-controlled islands of the Central Pacific continued in their role of forward air and naval bases and as staging points for the merchant, naval and air traffic being sent south from the homeland to support the New Guinea-Solomons battles. The advantages accruing to the Japanese from possession of the island bases in the Central Pacific were clear; internal lines of naval communication and availability of airfields for shuttling airpower around. During the early period of the Pacific campaign (1942-early 1943), the U.S. did not have the aircraft carrier resources to seriously threaten these island bases, only the increasingly effective submarine campaign affected Japanese operations in the Central Pacific. Much of the defensive capability of these islands was seriously hampered by the submarine war. Merchant ships carrying men and materiel to reinforce these bases were not arriving, to the overall detriment of the defensive structure in the region. Many island bases were not as strongly defended or heavily fortified as they should have been when American assault forces descended upon them. Less than adequate defenses plus the inability of the Japanese fleet units to effectively operate in the Marshalls and Gilberts, because of diminished carrier airpower, had a direct bearing on the success of the Central Pacific offensive.

However, it was also obvious to the U.S. that any assault on the island bases would require a major commitment of force that must be able to effectively cut off an atoll in the face of available Japanese naval and air power. Despite reduced support, the determination of the Japanese to hold these bases was undiminished. The tenacity of the defenders and their defensive strength was tested on Makin more than a year before Operation Galvanic, the code name for the Gilbert invasion, was put into effect.

The Makin Raid, August 1942

On August 9, 1942, the day Marine forces secured Guadalcanal and Tulagi in the Solomon Islands, two U.S. submarines departed Pearl Harbor with Lt. Col. Evans F. Carlson's 2nd Raider Battalion on board. NAUTILUS and ARGONAUT, both big prewar "V-boats" carrying two 6-inch guns each, were assigned to deliver Carlson's Raiders to Makin Island (actually Butaritari Island, known by the Gilbertese as Makin Meang) in the Gilberts for a hit-and-run raid. Ordered by Admiral Nimitz, the attack was primarily intended "...to secure intelligence about the Japanese installations, strength and inclination to fight for the atolls of the Central Pacific" (Hoyt 1978:1). The raid would also test the effectiveness of the newly formed Marine raider battalions as well, although their true test would come on Guadalcanal. Intelligence data indicated the Gilberts were relatively lightly defended, having been occupied by Japan after the war started, thus their selection as a target.

By August 16, the two submarines were off Makin and the raider forces were landed in the early morning in rubber boats with small outboard motors. The accidental discharge of a Marine rifle alerted the defenders (about 200 in number) and a firefight erupted. By late afternoon, Carlson's Raiders still had not secured the island, despite fire support from the submarines; the raiders had also taken about 30 casualties, 11 dead. The Japanese inclination to fight was certainly not in doubt--the Marines had to kill them all and were not able to capture any prisoners, nor quickly disengage. Forced to stay on the beach overnight, the Raiders withdrew the next day, but not easily. Boats swamped, motors died and many had to swim for it. Withdrawal was completed that day, despite some aerial harassment from Japanese aircraft from other islands. Total American casualties amounted to 18 dead and 12 missing; 9 of the missing were men unintentionally left behind, captured and executed.

The Marine raiders killed the defenders, burned supplies and installations, reportedly sank a small transport, captured

intelligence data, and then withdrew. The cold light of postwar analysis suggested the raid to have been more nearly a disaster, but the individual Marines had, as they would so many times, turned a bad situation into a victory. Postwar records show the Japanese did not lose any aircraft in this operation and the small transport was not credited.

Properly hailed as a victory in the wartime civilian press still beset by the early defeatist attitudes toward the war, the Makin raid was, in some respects, detrimental to the war effort. It tipped the Navy's hand to the Japanese and pointed out the glaring vulnerability of these outpost islands to the Japanese high command, who immediately began to correct this oversight. One island area in particular was immediately reinforced--Tarawa. The Japanese also scoured all the islands, rounding up coastwatchers and others, all of whom were subsequently tortured and killed.

Gilberts Invasion, November 1943

More than a year after the Makin raid, Operation Galvanic was originally to have included both Tarawa and Nauru islands, but Makin was substituted for Nauru late in the planning stages (Figure 6.2). American forces for the attack included the 2nd Marine Division under Maj. Gen. Julian C. Smith and the U.S. Army's 27th Division under Maj. Gen. Ralph Smith. Overall command of the assault forces went to another Smith, Marine Lt. Gen. H.M. Smith, nicknamed "Howlin' Mad." Command of the amphibious assault force, which now included eight escort carriers and seven old battleships, went to Rear Adm. Richmond Kelly Turner. Nearly 100 Army bombers and about 300 Marine and Navy land-based aircraft were used to support the assault, but the real punch behind the invasion was Admiral Spruance's 5th Fleet, including 6 big carriers, 5 light carriers, 8 escort carriers, 6 new battleships, 15 heavy and light cruisers, and 65 destroyers. Eighteen attack transports were accompanied by tankers, minesweepers, tenders and amphibious craft of the assault force.

The assault on Tarawa marked the return of the veteran carrier ENTERPRISE to the Central Pacific. Its last visit to the Central Pacific had been the raid on Wake and Marcus in February 1942. This time it would not be one lone carrier and two heavy cruisers. For this invasion, the carrier task forces would stick close in support of the landings rather than engaging in long-range, hit-and-run strikes against widely separated targets. This was a conservative approach to carrier warfare dictated as much by the fact that amphibious assault techniques were new and full of risk as by any conservatism on the part of the commanders.

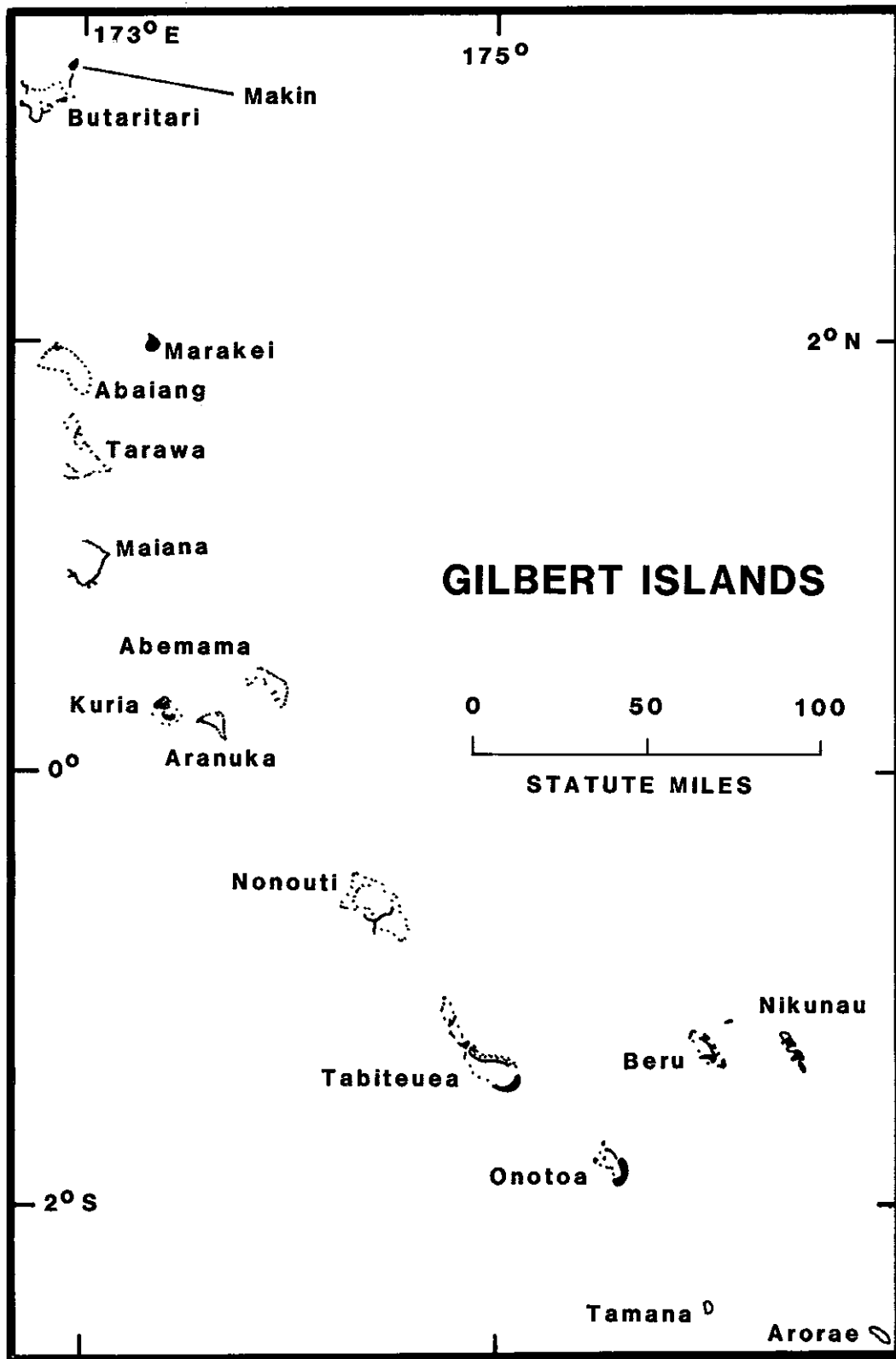


Fig. 6.2. Both Tarawa and Makin were heavily defended, and the battles there were the first in which the Marines faced the Japanese. The recapture of the Gilberts was a turning point in the Pacific War.

The carriers did participate in softening up the islands in September 1943, when three carriers struck Butaritari in Makin Atoll and Betio in Tarawa Atoll. The islands were attacked several times on September 18, which caused considerable damage to facilities and destroyed aircraft and shipping, mostly small vessels. The Japanese defenders were now assured of continued attention as they prepared for the inevitable assault. In October, the carriers attacked Wake, doing more damage and destroying air power in the area. Like the early raids in the Central Pacific, carriers and aircraft were given a final honing and training before the main assault, but unlike previous raids, knocking out the supporting air power that could interfere with the assault was a primary objective. The stage was set, and carrier- and land-based air pounded the Gilbert Islands continuously prior to the invasion.

Opposing the landings on Tarawa and Makin were the 7th Sasebo Special Landing Force and supporting units including labor battalions, commanded during the assault by Rear Adm. Keiji Shibasaki. Admiral Shibasaki's men had constructed impressive defenses on Tarawa where Japanese forces were concentrated. Makin had fewer men and less elaborate defenses, but overall the area had been converted into a virtual fortress.

On the morning of November 20, 1943, the Marine and Army assault forces landed on Tarawa and Makin in the face of intense opposition and were hampered by the miscalculation of tides that stranded many landing craft hundreds of yards off the beach. The preassault bombardment by ships and aircraft had been insufficient, leaving many areas undamaged. Tarawa became a three-day blood bath in which the outcome was in doubt for the Marines before they finally gained the upper hand on the second day of the invasion. Makin was easier, but the U.S. Army's 27th Division, less experienced than the Marines and unfortunately saddled with some ineffective commanders, had a tough time of it. While the Marines and Army suffered thousands killed and wounded while assaulting the formidable defenses of Makin and Tarawa, the Navy provided air cover for the assault. Because the carriers were tied to the vicinity of the amphibious assault, they were vulnerable to attack. The escort carrier LISCOMBE BAY paid for that vulnerability and was torpedoed and sunk by I-175 on November 21, 1943, with the loss of over 640 men. Nearly 1,000 men died assaulting Tarawa and over 2,000 were wounded. The Japanese garrison was killed almost to a man; a few Japanese were captured but most of the survivors were Korean laborers. The defenders and the defenses gave a clear indication of how it would be in the Central Pacific as each island base was captured.

After the battle, it was apparent that serious American mistakes were made at Tarawa. The need for effective, self-propelled, landing craft capable of negotiating reefs was high on the list along with much more naval and aerial bombardment. To the credit of the senior American commanders, these deficiencies were rapidly corrected, although it was clear that no amount of bombardment was going to be completely effective against the types of defenses the Japanese were installing throughout the Central Pacific.

For one part of the Central Pacific, Japanese naval and merchant traffic ceased and American development began. Capture of the Gilberts resulted in an immediate influx of men and material to construct and activate U.S. air bases and facilities to be used in pounding the Marshall Island bases in preparation for the next amphibious invasion. Airfields constructed on the Gilbert Islands were heavily used for land-based bombing, reconnaissance, transport and supply efforts directed at the Marshalls and, later, Truk. The advance across the Central Pacific was so rapid that many of the Gilbert Island bases were greatly reduced in personnel and capability within a year, some serving primarily as transport centers. Invasion of the Marshalls was made considerably easier by the presence of a large photoreconnaissance team based in the Gilberts. American forces were thus able to obtain up-to-date intelligence on Japanese naval and base facilities in the Marshalls, unlike the situation prior to the invasion in the Gilberts when reconnaissance efforts were more limited and far less effective.

Neither Makin nor Tarawa was large enough to develop into a major fleet base--a fact often used to criticize the Tarawa invasion and its cost. However, the U.S. Navy had to begin somewhere, and the Gilberts were the easiest piece of the Central Pacific to cut off. Despite the cost and despite their limited long-range usefulness, the Gilberts were the correct place to start. Capture of the Gilberts opened the entire Central Pacific to invasion.

U.S. submarine patrols continued to focus their efforts on constant attrition. With ever-increasing success, they prevented many tons of supplies and personnel from getting to the Japanese "front lines." For example, one submarine sank a transport and prevented some 1,200 troops from arriving at Tarawa prior to the American invasion. The troops that survived sat out the war in Jaluit. Although the submarine service had been plagued with torpedo trouble up to late 1943, the problems were fixed and the increase in sinkings was immediate and serious. Increasingly, submarine effectiveness contributed significantly to the effort directed at conquering the remainder of the Japanese-held

Central Pacific islands. Newly-published (1989) documents also show that a considerable number of damaged ships at various island bases burdened the Japanese supply problem even more than had been thought (for more on this, see the section on the Truk Raid).

The capture of the Gilberts, provided the "break" in the Japanese outer defensive perimeter vital for eventual victory. This battle also marked the end of the Japanese advance across the Pacific (Figure 6.3). It also allowed the Navy and Army to increase the pressure on the next targets and keep areas that were to be by-passed pounded down and ineffective for the remainder of the war.

By-passed island bases were not ignored, rather, they came under day and night bombing raids, bombardment by surface ships and general harassment. Most remaining Japanese island bases turned from defense to vegetable gardening and fishing as the war continued and no surface or air transport could get through with supplies. The Japanese Navy, under pressure from the Army, continued to attempt to supply these bases by submarine with limited success. It was now far more dangerous for Japanese submarines anywhere in the Pacific than for their American counterparts; the U.S. Navy, learning from its Atlantic experiences with U-boats, had a far more effective antisubmarine program than did Japan.

Kwajalein Invasion, January-February 1944

Planning for the invasion of the Marshalls by U.S. forces was concurrent with that for the Gilberts because of the proximity of the two island groups and the necessity of a tight schedule to fit in with other planned Pacific operations in the Solomons and New Guinea.

Pressure on the Marshalls to the northwest increased after the successful attack on the Gilbert bases. Admiral Nimitz, in response to the naval problems associated with the Gilbert campaign, specifically the loss of LISCOME BAY and damage to INDEPENDENCE and LEXINGTON, determined that fast carrier raids should be more aggressively used to eliminate air power in the vicinity of the next targets. Further, he hoped to limit damage by not tying carrier forces too close to an amphibious invasion for too long.

On December 4, 1943, two of the carrier task groups of Task Force 50 (soon to become TF-58) raided Kwajalein itself (Figure 6.4). Four heavy and two light carriers attacking from the unexpected northern direction destroyed many aircraft, sank at least four transports and damaged the light cruisers ISUZU and NAKA in attacks on Roi-Namur and Kwajalein

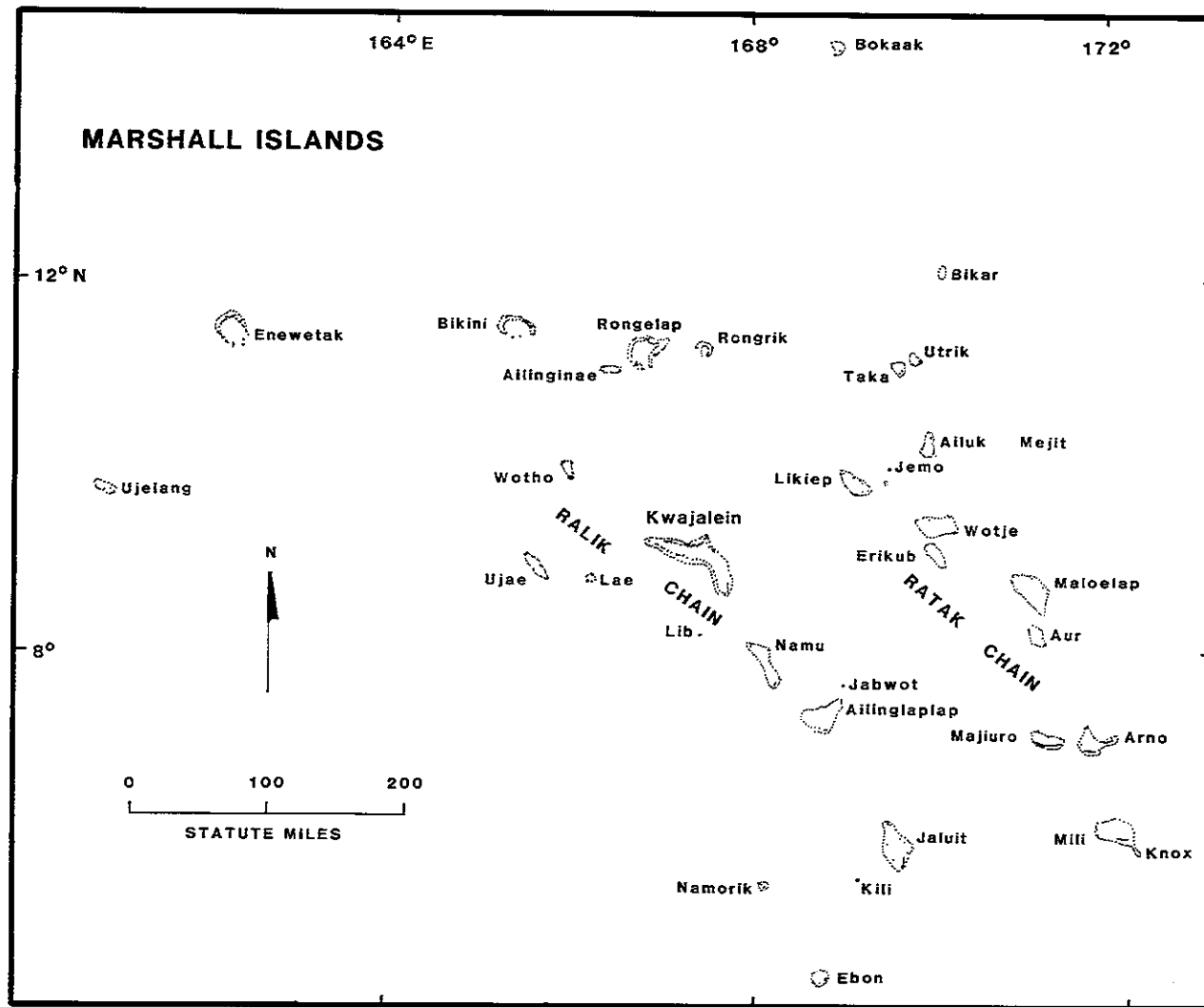


Fig. 6.4. The islands of Kwajalein, Wotje, Jaluit, Maloelap and Mili were all heavily reinforced by the Japanese prior to the attack on the Marshalls in January-February 1944.

as well as Wotje. Aircraft, airfields, defenses and base facilities were also hit hard. The Japanese responded with night air attacks on the withdrawing carrier group, damaging the carrier LEXINGTON with one torpedo hit.

Kwajalein, central atoll of the Marshall group, was always considered a prime target in Pacific war planning. It was finally selected as the focal point for the next American assault because of the almost-completed airfield there and because solid intelligence data indicated to Admiral Nimitz' planners that it would be an easier target than Wotje, Maloelap, Jaluit or Mili, all of which the Japanese were reinforcing to the best of their ability after the fall of the Gilberts. Selection of Kwajalein met with resistance from Nimitz' subordinate commanders, who felt the eastern group of islands, the Ratak Chain, would be more appropriate. Nimitz prevailed, primarily because he felt his air admirals, chafing under the command of more conservative surface-oriented officers, were correct in their assumption that the fast carrier task force, properly employed, could hit widely separated islands and keep them ineffective while Kwajalein was assaulted. There were enough carriers for the job now, including escort carrier groups that could absorb much of the "routine" assault work on the beaches as well as antisubmarine patrol and free the big carriers for operations distant from the primary target.

The Kwajalein assault gave the U.S. Navy an opportunity to utilize the big carriers without being too conservative. This time the carriers would be more mobile and would avoid the mistakes of the Gilberts. The Kwajalein invasion would add its weight to the theories of the air-minded Navy, and set the stage for the devastating carrier air attack at Truk later in the war.

The organization for "Operation Flintlock" was similar to "Galvanic" in the Gilberts and utilized many of the same naval task groups and amphibious forces. Admiral Spruance, Commander 5th Fleet, was in overall command, while Rear Adm. Turner was again in command of the assault forces (Task Force 51). Maj. Gen. C.H. Corlett, USA, commanded the 7th Infantry Division assigned to assault Kwajalein. The northern landing force on Roi-Namur was under the command of Maj. Gen. Harry Schmidt, U.S. Marine Corps, with units of the 4th Marine Division. The reserve force under Capt. D.W. Loomis, U.S. Navy, was used as a floating back-up in case things got tough on the beaches; as it turned out, this group became Task Group 51.11, assigned to take Eniwetok (Operation "Catchpole"). There were approximately 54,000 assault troops in these three groups in comparison to about 27,800 troops in the Gilberts operation.

The joint expeditionary force for the assault consisted of almost 300 ships plus the fast carrier task force and submarines assigned to war patrols and reconnaissance in the area. This assault force was a considerable improvement over that used for the Gilberts operation, whose harsh and bloody lessons had been quickly learned. Amphibious assault forces were greatly improved by better amphibious tractors and supported by modified amphibious vehicles designed for close inshore fire support of landing troops. Communications between commanders and forces ashore were greatly improved by specially designed communications and command ships, such as Admiral Turner's flagship ROCKY MOUNT. Improved air support and attack techniques were developed for the assault, including better air communications and practice against fortifications such as those found at Tarawa, which were constructed on Kahoolawe in the Hawaiian Islands for Navy and Marine practice.

Overall, the preparation for the Kwajalein assault was a vast improvement over that for the Gilberts, particularly direct support for the assault troops during the landings and the air assaults prior to the landings. The fast carrier task force, aided by land-based air from the Gilbert bases, gained control of the air and eliminated Japanese air power before the assault. The strategy used for Kwajalein set the pattern for all subsequent Pacific island operations.

The Japanese responses to American preparations for attacking Kwajalein were conspicuous by their absence. Admiral Koga, commander of the Combined Fleet following the death of Admiral Yamamoto in April 1943, in his flagship MUSASHI at Truk, had little with which to respond. Koga's carrier- and land-based aircraft had been exhausted in the continuing struggle to hold the Bismarcks and Solomons against the combined MacArthur-Halsey assaults in the south and southwest Pacific. Some Imperial Japanese Navy submarines were deployed from Truk on offensive patrol; however, these were the only representatives of the Navy on hand when Kwajalein was invaded. Their impact on events can be gauged by the fact that the historical record mentions that four submarines were lost and little else.

The Imperial Navy, still crippled by the loss of four aircraft carriers at Midway, could not defend the Central Pacific, and the Imperial Army was fully occupied elsewhere. Without fast carriers and their aircraft and with insufficient long-range bombers operating in the Central Pacific, the still-powerful Japanese Combined Fleet's surface warships could not successfully intervene when faced with a U.S. force of 10 to 12 heavy and light carriers plus a battle group of 8 fast new battleships and their escorts. The decision of the high command was obvious--the Central Pacific

perimeter would not be heavily reinforced; those soldiers and sailors already there would stand and die, extracting as heavy a toll as possible in the process, while the defensive perimeter was redrawn on the Tokyo situation maps. Many similar decisions would have to be made in the near future, and each new line would be drawn closer to Japan itself.

On January 31, 1944, a small assault force under Rear Admiral Hill took Majuro Atoll in the eastern Marshalls in the first stage of the Kwajalein assault. Three Japanese soldiers were captured and no one was killed on either side. Majuro was captured by 9:55 a.m., and the American flag was "...raised on the first Japanese territory--Japanese before the war--to fall into American hands" (Morison 1951 VII:227). The first break had been made easily, but much bloodshed would follow on Kwajalein and Roi-Namur.

Naval bombardment of Kwajalein from the old battleships and support cruisers and destroyers commenced early on January 31, 1944, while the assault forces disembarked from transports and headed for Roi-Namur. Assault troops hit Red and Green beaches on Roi and Namur, respectively, about noon on January 31, and the fight turned into the same fight that would develop on every Pacific island invaded--tough, bloody and relentless, against an intelligent, resourceful and exceptionally tenacious enemy. The extent to which lessons from Tarawa were taken to heart was obvious in this assault, because the Roi-Namur complex was captured in three days of hard fighting, although the island was better prepared and defended than Tarawa. Naval air and surface bombardment was far heavier than in previous attacks, and the assault forces were better prepared, trained and equipped for the job. Almost three times the tonnage of bombs and shells landed on Roi-Namur than were spent at Tarawa, and the old battleships were operating less than a mile offshore, with lighter ships operating even closer. Additionally, artillery battalions landing on small islets near Roi-Namur added their explosives to the devastation, along with general and call-strike air support throughout the assault.

Small islets adjacent to Kwajalein were captured on January 30, 1944, with about 125 Japanese killed compared to 3 Americans. One of the benefits of this preliminary assault was the capture of some 75 secret Japanese naval charts of considerable value for operations in the Central Pacific, particularly information on minefields. On January 31, Ennylabegan and Enubuj, small islets that form a portion of Kwajalein Atoll's protective reef, were captured for use as artillery bases and the main assault on Kwajalein itself commenced on February 1.

Japanese defenders resisted the Americans with the same ferocity regardless of odds or equipment; most had to be found, dug out, and then burned, shot, or buried in their defenses; very few surrendered. The Japanese policy of "no surrender" was one of the factors that prevented air and ship bombardment from being all that the ground soldier, who had to step onto the beach, might wish. This was particularly true in areas where the Japanese could really dig in, such as Pelileu and Iwo Jima. The prelanding bombardment assault on the Kwajalein Islands was probably as successful as any; for example, of the Roi defenders only about 300 men survived the bombardment. Roi and Namur were overrun by 2:15 p.m. on February 2, 1944, with the last Japanese killed or captured. The 4th Marine Division was quickly relieved by garrison and construction units, and the islands were in use as an air base complex within two weeks. The battle on Kwajalein was similar to that at Roi, but elements of the U.S. Army's 7th Infantry Division, which had captured Attu, faced the Japanese on that island.

As an example of prelanding surface and air bombardment, Kwajalein had few, if any, equals when one considers the acreage under attack. For this island alone, the U.S. Navy deployed 4 old battleships, 3 new battleships (borrowed from the supporting fast carrier task group), 3 heavy cruisers, 1 light cruiser and 11 destroyers. Air support was provided by two heavy, one light and three escort carriers, although air support was somewhat limited by bad weather. In varying degrees, this weaponry was deployed against Kwajalein from the morning of the assault until the island was secured. This type of close-in continual support earned the nickname "Spruance Haircut."

Assault troops landed on the Kwajalein lagoon beaches on February 1, 1944, at 9:30 a.m.--1,000 troops were ashore within 10 minutes. Pitted against about 4,000 defenders, they advanced inland and by 11:30 a.m. were facing determined resistance from well-prepared positions. Although the pressure on both sides was continual, by nightfall over 10,000 American troops were ashore. At night the assault troops faced the usual Japanese night attacks, infiltration and harassment. The night attacks staged on Kwajalein were repulsed, with heavy losses for the Japanese. Continual fire support was provided by the Navy for the American troops ashore, a luxury the Japanese did not have. Progress against the ingenious Japanese style of concrete and coconut-log blockhouses, bunkers and trenches was slow, but by February 5 the fighting was over, leaving only the precautionary cleaning up of the smaller islands of the atoll. On February 6, 1944, the garrison forces took over. American casualties for the battle were around 372 killed and 1,582 wounded with

about 7,870 Japanese killed and 265 taken prisoner (Morison 1951 VII:278).

While Kwajalein (and Eniwetok in particular) became advanced naval bases and airfields, the problem of Truk and the Marianas with their unknown quantities of air power was addressed by the fast carrier task force. Following support of the Kwajalein invasion, the fast carriers took the next step in their wartime development as a powerful, fully effective, strategic weapons system. The Imperial Japanese Navy, on the other hand, would become incapable of winning any battle, in a strategic sense, anywhere in the Pacific.

Capture of Eniwetok by Brig. Gen. T.E. Watson's 8,000 troops, Operation "Catchpole," quickly followed Kwajalein. The reserve force troops, augmented by units that had participated in the capture of Kwajalein assaulted and captured Engebi Island on February 17-18, 1944, and Eniwetok itself on February 19-23. Japanese resistance was very light in comparison with other island assaults, primarily because there was very little with which to resist. Engebi was a small airfield used for shuttling aircraft elsewhere and Eniwetok had not even been reinforced by the Japanese until the Gilberts fell.

Eniwetok's large lagoon became a forward U.S. naval base of considerable importance in the advance across the Pacific, and American construction and build-up on the atoll's three major islands almost obliterated evidence of Japanese occupation on land.

Truk Raids, February-April 1944

With the entire eastern half of the Central Pacific in American hands, the strategic situation for the Japanese, particularly in regard to Truk, changed dramatically. Truk was now vulnerable to attack, particularly from the fast carriers who did not have to worry about land-based aircraft at their back if they penetrated too far into the Central Pacific. Admiral Koga was quick to pull the Combined Fleet west to Palau and to leave behind in Truk only those ships that could not leave because of damage or, for one reason or another, had to stay. Soon these ships would be gone.

The Truk garrison was, however, in a position to flank any further U.S. movements in the Pacific beyond Eniwetok. The Marianas bases were also a threat to further westward movement, as they also had long-range bomber units available.

For the fast-carrier task forces, the raids made in the Central Pacific in early 1944 were the next important

development in carrier warfare. Strikes directed at Truk, Yap, Ponape, Palau and the Marianas were independent of any immediate amphibious follow-up; so the fast carriers ranged far and wide at their own pace and schedule. These powerful, sustained strikes at enemy outposts were closely coordinated with the capture of Eniwetok and the remainder of the Marshall Island bases. The same carriers provided support during the Hollandia landings in New Guinea.

At the time "Hailstone" was scheduled, American planners were not yet sure if Truk, the first target, would eventually have to be invaded. More information on Truk's strength and capabilities was needed before such a determination could be made; little was really known of Truk's defenses at the time other than that it was the main forward base for units of the Japanese Combined Fleet. Regardless of its potential or actual capabilities, it was obvious to American planners that Truk would have to be neutralized. With the majority of amphibious forces committed to Kwajalein and operations in the South Pacific, the fast-carrier task force was the ideal tool for the job because of its massed hit-and-run capability.

The first photographic reconnaissance of Truk was made February 4, 1944, by a B-24 Liberator from Bougainville. Appearance of reconnaissance aircraft tipped the Japanese that something was in the wind. All those ships of the Combined Fleet that could, left Truk immediately. Only two light cruisers, NAKA and KATORI, and about eight destroyers remained from the fleet units. The damaged light cruiser AGANO, the largest light cruiser to be sunk by a U.S. submarine in World War II, left Truk on February 16 but never made it home, as it ran into a spread of torpedoes from submarine SKATE instead. With the heavy Combined Fleet units gone, Truk was even more vulnerable to attack because it had never been heavily built up defensively, although Truk did have impressive anti-aircraft defenses.

Before dawn on February 17, 1944, the carrier task groups, undetected by the Japanese, moved to within 90 miles of Dublon. Spread across an ocean area larger than the targets they were attacking, the aircraft carrier task groups were composed of 5 heavy carriers, ENTERPRISE, YORKTOWN, ESSEX, INTREPID and BUNKER HILL; 4 light carriers, BELLEAU WOOD, CABOT, MONTEREY and COWPENS; 6 new fast battleships, IOWA, NEW JERSEY, SOUTH DAKOTA, ALABAMA, MASSACHUSETTS and NORTH CAROLINA; 5 heavy cruisers, SAN FRANCISCO, BALTIMORE, WICHITA, MINNEAPOLIS and NEW ORLEANS; 5 light cruisers, SANTA FE, SAN DIEGO, MOBILE, OAKLAND and BILOXI; and 26 destroyers. The first strike on Truk was a fighter sweep designed to knock down enemy air power; the 5 big carriers launched 72 F6F Hellcats while the light carriers provided combat air

patrol over the fleet. The first strike was successful; although 90 Japanese aircraft attempted to intercept, 30 were shot down and 40 were destroyed on the ground. Only four American fighters were lost in this strike. The second strike included 18 Avenger torpedo bombers, loaded with fragmentation bombs, destined for the airfields of Eten, Moen and Param. As Morison wrote, "...of 365 aircraft at Truk when the raid began, fewer than 100 remained unscathed..." (Morison 1951 VII:320).

With the fighters and bombers beaten down, the shipping in Truk Lagoon was next. The light carriers began launching deckloads of fighters, dive bombers and torpedo bombers in staggered lots for continuous coverage. "The power of this bombing attack may be gauged roughly by the fact that there were thirty strikes in all, each stronger than either of the two Japanese strikes that had done all the damage at Pearl Harbor" (Morison 1951 VII:321). Destruction to the fleet train and auxiliaries was enormous, with over 200,000 tons of shipping, both naval and merchant, sent to the bottom or irreparably wrecked. This includes shipping sunk on the night of February 17, 1944, by 10 radar-equipped Avengers from ENTERPRISE in the first night-time carrier strike of the war. About one-third of the total damage to shipping at Truk was credited to this night attack.

The task force did not get off unscathed, however, as the Japanese had radar-equipped planes as well. Six or seven B5N "Kate" torpedo bombers made a run on the force late in the evening of February 17, 1944. Evading night fighters, one Kate was able to get a torpedo into INTREPID about 11:00 p.m. Eleven men were killed and seventeen wounded, and INTREPID had to be detached along with the light carrier CABOT, two cruisers and four destroyers for protection. Despite this, the attack on Truk was not stopped or even appreciably slowed down.

Operations resumed on February 18, 1944, with carriers ENTERPRISE, ESSEX, YORKTOWN and BUNKER HILL "on the line" launching strikes against the remaining ships and concentrating on airfields, ammunition supplies, hangers and field facilities. By the time the carriers withdrew around noon, 1,250 combat sorties from the carriers had dropped almost 500 tons of bombs and torpedoes on the ships and facilities at Truk.

The Truk raid was enormously effective. The combination of air power, which did the majority of damage, surface ships and submarines, operating in the area in late February, sank over 30 ships. In addition to the light cruisers KATORI, sunk by surface forces, AGANO, sunk by a sub and NAKA, sunk by aircraft; the Japanese fleet also lost the modern

destroyer MAIKAZE, sunk with KATORI, the old destroyers TACHIKAZE, OITE and FUMIZUKI; motor torpedo boat GYORAITAI NO. 10; and subchasers CH-24 and 29. Merchant ship destruction, including naval auxiliaries was even more serious--transports AKAGI MARU, KIYOZUMI MARU, AIKOKU MARU, all ex-armed merchant cruisers; YAMIGIRI MARU, TAIHO MARU, MATSUTANI MARU, KENSHO MARU, AMAGISAN MARU, HANAKAWA MARU, UNKAI MARU NO. 6, YAMAKISAN MARU, SAN FRANCISCO MARU, REIYO MARU, HOKUYO MARU, ZUKAI MARU, GOSEI MARU, JOSAN MARU and SEIKO MARU all went down along with aircraft transport FUJIKAWA MARU, ammunition ship NICHIRO MARU, water carrier NIPPO MARU; and auxiliary fleet tankers FUJISAN MARU, HOYO MARU, SHINKOKU MARU and TONAN MARU NO. 3. TONAN MARU NO. 3 was the second largest merchant vessel in Japanese service, exceeded only in size by its sister TONAN MARU NO. 2. TONAN MARU NO. 3 was salvaged by the Japanese after the war. Both ships were originally whaling factory ships.

U.S. submarines operating in the general area also caused several other losses, but these subs were on normal war patrol and were not specifically assigned supporting roles during the Truk raid.

The Navy's later assessment showed that, overall, the planes could have done better, particularly against the ships, but the damage was still enormous, especially among tankers and other ships of the Japanese Combined Fleet's supply train. The loss of auxiliary and fleet tankers, with their at-sea refueling rigs, was the most serious, depriving the Combined Fleet of its ability to sustain long-range, long-duration operations in the Pacific, at least until more tankers could be deployed. In this sense, the new American fast carrier task force, without actually sighting or directly attacking a single large unit of the Combined Fleet, managed to force that fleet thousands of miles westward, first to Palau and then to Borneo and Lingga Roads. Without sufficient air power, Japan's surface Navy was unable to engage U.S. forces on equal terms; retreat was the only alternative. The Truk strike was the first dent in the remaining Japanese defense perimeter, and Truk was rendered useless as a forward fleet base. Truk had been so reduced by this strike, and others to follow, that U.S. planners struck it from the list of assault targets and consigned Truk to the realm of the by-passed islands to be harassed by bomber assaults throughout the remainder of the war. Finally, on September 2, 1945, Vice Adm. Chuichi Hara surrendered Truk to American forces on the heavy cruiser PORTLAND; Vice Adm. George D. Murray, once commanding officer of the ENTERPRISE, accepted the surrender for the U.S. Navy.

Following the Truk strikes, the fast carrier forces headed for their next targets--Palau and the Marianas, a clear

indication that the U.S. Navy was now dominant in the Pacific.

Mariana and Palau Raids, March-April 1944

The hit-and-run raid by Vice Adm. Marc Mitscher's fast carrier task force on February 17-18, 1944, brought a new phase of warfare to the Central Pacific. The expansion of the U.S. Pacific fleet that began in mid-1943 finally provided sufficient large carriers to attack any target, even those that had large land-based air forces.

The destruction of aircraft, shipping and base facilities at Truk had shown that the carrier task force was, and would remain, the dominant offensive force at sea. In sufficient numbers and properly employed, the American fast carriers would be used not only to cover American amphibious operations during the always-dangerous assault phases, but also in far-ranging strikes against enemy targets close enough to provide air support to besieged Japanese defenders. Once American amphibious forces hit the beachhead, the defenders would be cut off from resupply and rearmament from other island bases or the home islands.

The capability of the U.S. Navy to strike and seal off an area by using the fast carriers would wrest the remainder of the Japanese Central Pacific empire away in less than a year. This strategy would also open the door to the Philippines and Japan itself with tactics undreamed of at the beginning of the war. U.S. Naval air power gained skill and improved tactics and equipment as each target was attacked. The carrier forces that attacked the Mariana Islands were much more effective than the forces that had assaulted the Gilbert and Marshall islands, although many of the ships were the same.

The power of the fast carriers and their effect on the Japanese military machine can be gauged by the desperation of the eventual Japanese response--the kamikaze. In effect, the kamikaze was a cruise missile, at least from the point of view of those being attacked. One can speak volumes about the use of a human guidance system as opposed to computers, but the fact remains that the kamikaze was very effective against aircraft carriers, particularly later in the war. The seeds of the kamikaze effort would be planted in the results of the upcoming assault on the Marianas that was scheduled to begin in June 1944. But before the first assault wave hit the beach on Saipan, there was much work for the fast carriers in the Central Pacific. And as always, veteran carrier ENTERPRISE would set the pace for the Fast Carrier Task Force, TF58.

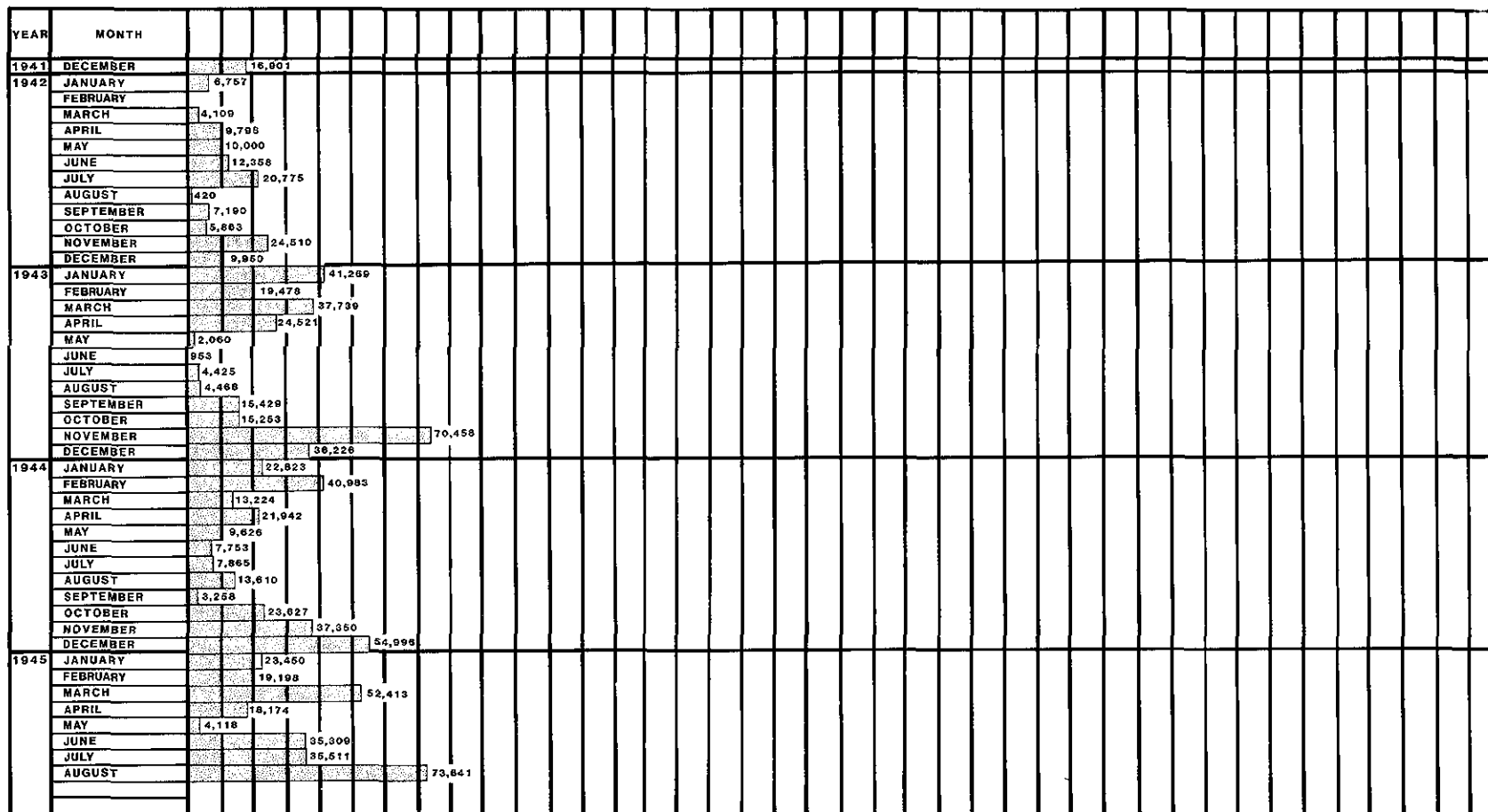
The strike at Truk caused Admiral Koga, now commander-in-chief of the Combined Fleet, to withdraw all forward units to Palau, 1,055 miles west of Truk. Although this removed the Japanese fleet from immediate danger, it also further exposed the entire Central Pacific to U.S. fleet- and land-based attack. By-passed island bases were subject to constant harassment and interdiction raids by surface forces, submarines, carriers and land- and sea-based air power for the remainder of the war without interference from Japanese naval units. From the U.S. viewpoint, keeping by-passed island bases in the Central Pacific pounded down night and day prevented any surprises from behind the lines as the war moved westward and ensured no reinforcements were moved to forward points. As a bonus, these scattered attacks provided minimum-risk practice for untried air groups and the like before they went on to more serious action at "the front." The general effectiveness of these attacks is reflected in the loss of merchant ships to attacks from U.S. Navy and Army aircraft (Figure 6.5, 6.6 and 6.7).

Admiral Koga's retreat from Truk was not wholly defensive as the presence of major Combined Fleet units at Palau still posed a threat to MacArthur's planned advance on Hollandia on the northern New Guinea coast. As a result, a carrier raid on Palau was ordered by Admiral Nimitz to follow the already-planned first strike on the Marianas. With an enormous fleet train of tankers and support ships capable of keeping the fast carriers at sea for months, by choice rather than necessity, inserting another raid in the schedule at such a late date was not really a serious strain on the U.S. Pacific fleet, and plans moved forward accordingly.

The first air attack on the Marianas commenced on February 23, 1944, with the carriers launching from west of Guam to take advantage of the prevailing winds. American aircraft destroyed well over 160 Japanese aircraft in the air and on the ground during these attacks as well as facilities, small patrol craft and some small merchantmen or auxiliaries. Submarines stationed around the Marianas intercepted escaping ships, and merchant tonnage losses from all sources amounted to nearly 50,000 tons. Most importantly, American aircraft photographed all the islands and, as Morison indicates in his history, "...the photographic intelligence obtained was even more important than the destruction wrought" (Morison 1951 VIII:155).

Following the first Marianas strike, the fast carriers returned to Majuro for rest and replenishment while the various land-based air commands continued to pound by-passed Japanese bases in the Central Pacific. TF-58 sortied from Majuro on March 22, 1944, for Palau where strikes were

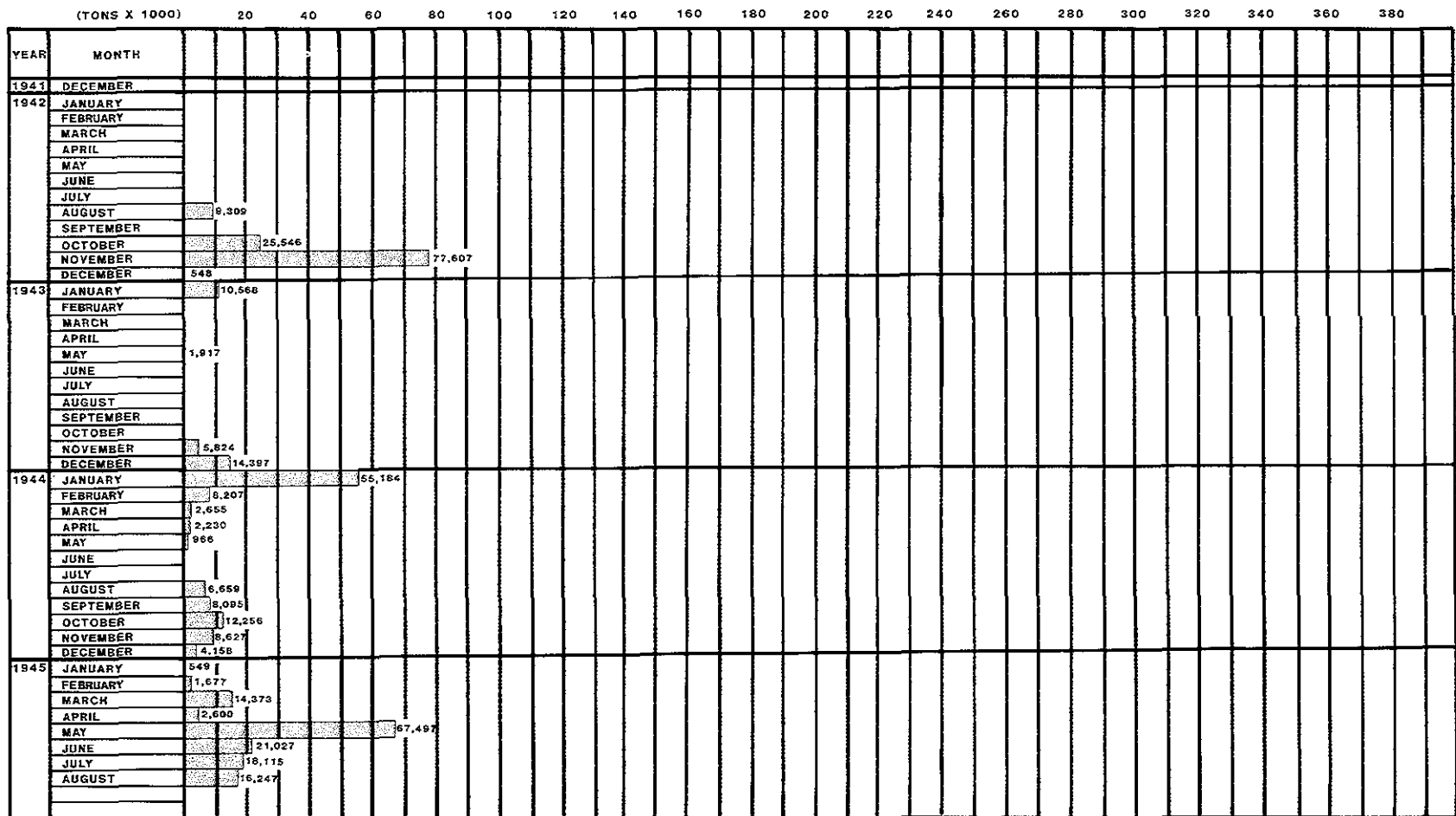
(TONS X 1000) 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380



FROM UNREVISED JANAC/USSBS SOURCES, 1947

(300 VESSELS FOR 909,572 TONS)

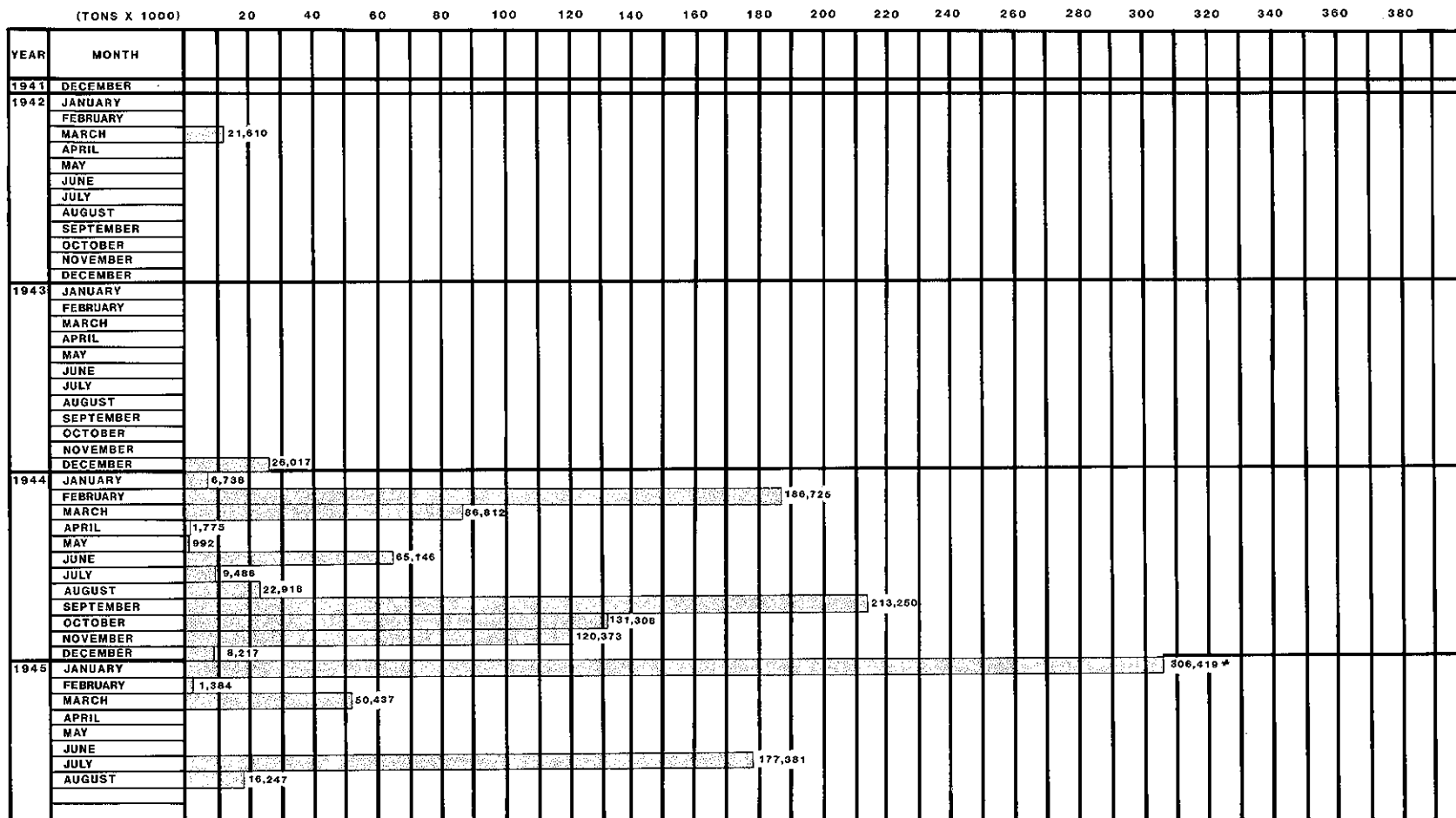
Fig. 6.5. Japanese merchant ship losses to U.S. Army aircraft December 1941 through August 1945.



UNREVISED FIGURES FROM USSBS/JANAC SOURCES, 1947

(144 1/2 VESSELS FOR 383,168 TONS. THIS INCLUDES VESSELS DAMAGED FOR DURATION.)

Fig. 6.6. Japanese merchant ship losses to Navy land-based aircraft
December 1941 through August 1945.



FROM UNREVISED JANAC/USSBS SOURCES, 1947

(393 1/2 VESSELS FOR 1,453,133 TONS)

* FOR PURPOSES OF THIS GRAPH, SHIPS LISTED AS DAMAGED AND OUT OF ACTION ARE INCLUDED WITH SINKINGS

Fig. 6.7. Japanese merchant ship losses to Navy carrier aircraft December 1941 through August 1945.

scheduled to commence on April 1. Plans were advanced a day, however, because the task force was sighted on March 25 and 26 by Truk-based search planes. As was usual in these attacks, U.S. submarines surrounded the Palaus in hopes of picking off fleet units escaping from the harbor. However, the Japanese were tipped off and the major fleet units had already left at high speed and had avoided the waiting submarines. Loss of one submarine, TULLIBEE, sunk by one of its own torpedoes making a circular run, and unfamiliarity with Palau in general caused the submarines to be less successful than at the Marianas. Only the super battleship MUSASHI, hit forward by one torpedo from U.S. submarine, TUNNY, was damaged in the escape from Palau. Despite the retreat of the Japanese Combined Fleet, Palau was not entirely defenseless, and on March 28 the fast carriers were attacked by Japanese torpedo bombers, with no damage to the fleet and many losses for the Japanese.

By March 30, 1944, Palau's defenders were as ready as they could be for the attack, but readiness availed nothing. The carriers BUNKER HILL, LEXINGTON and HORNET sent in their Avenger torpedo bombers, armed with mines, and sealed the harbor exits. They trapped over 30 ships, which were then destroyed at leisure during the following day and a half of air strikes by the fast carriers. Postwar accounts credit some 36 ships sunk or destroyed for almost 130,000 tons. Losses to this air attack included the fleet repair ship AKASHI; old destroyer WAKATAKE; PATROL BOAT NO. 31; submarine chaser CH-6; auxiliary submarine chasers CHA-22, 26 and 53; naval tankers SATA, IRO and OSE; auxiliary netlayers NISSHO MARU NO. 5 and SHOSEI MARU; and auxiliary tankers AKEBONO MARU and AMATSU MARU among many others documented in the historical sources. Later TF-58 raids and the invasion of Palau would add still more victims to the list.

As at Truk, many of these ships were part of the fleet train of the Combined Fleet and the losses, particularly of naval tankers, had a profound effect on the future course of the war. Palau's air bases and aircraft were also severely damaged, but the island's proximity to the Philippines meant that the only real knock-out blow to Japanese air power would be by invasion. As it was, the retreat of the Combined Fleet to Tawi-Tawi, Borneo and Lingga Roads was a severe defeat in itself. All of New Guinea now lay open to invasion, and that invasion by MacArthur's forces was not long in coming.

Following the Palau strike, the fast carriers returned to Majuro, striking Yap and Woleai on the way. By April 6, 1944, the fast carriers were all back at Majuro and were preparing for the support of the Hollandia invasion and additional raids in the Central Pacific.

The raids on Truk, the Marianas and Palau set a new standard of warfare in the Pacific. Gone were the fast isolated raids by small carrier groups, replaced by massive long-range strikes sustained for days at a time. The addition of night operational capabilities a little later in the war would make 24-hour operations possible as well. Combined with amphibious forces, the offensive carrier forces would be unstoppable. Air operations combined with the constant attrition by submarines would bleed the Japanese Empire dry. First, however, a forward operational base would be needed to ensure the assault on Japan could not be outflanked. The Marianas were ideal for this purpose and would also serve as bases for the new B-29 bomber.

One great advantage accruing to U.S. forces preparing for the assault on the Marianas was the fact that the fast carrier task force had forced the Japanese Combined Fleet from Truk to Singapore and the home islands. Gathering the Combined Fleet to defend the Marianas would now be far more difficult, and the fuel oil situation would be critical, both elements of disaster. While the Truk and Palau raids did much damage to shipping in the area, they also had strategic impact because they displaced Japanese forces from effective interference in the Marianas.

In the period from November 1943 to April 1944, the fast carriers and their supporting battleships, cruisers and destroyers assisted in the capture of two island groups in the Central Pacific, pounded some 20 other small island bases into impotence, destroyed 2 major Japanese fleet bases at Truk and Palau, and shoved the still powerful Combined Fleet some 2,000 miles westward without having directly engaged that fleet in air or surface action. The fast carriers also supported a major invasion in the South Pacific until land-based air could take over, made the first strike into the Japanese inner defense perimeter, and gained enormously valuable photo intelligence in the process. In the dark days of February 1942, it had been ENTERPRISE and two cruisers on a lone raid into the Central Pacific. Now it was ENTERPRISE and a carrier task force that, in battle disposition, covered some 400 square miles of ocean. Later in the war, the Okinawans would coin the phrase "typhoon of steel" to describe the effect of such a task force.

Assault on the Mariana Islands

The Marianas presented a much different target for the American amphibious forces assigned to its capture (Figure 6.8). Instead of small atoll islands, the Marianas were larger, with rugged mountainous terrain. There was plenty of

room for defending armies to maneuver and plenty of opportunity for in-depth defensive positions. Fortunately for the assault forces, all was not well with the defending Japanese in the summer of 1944.

Although Guam, Saipan and Tinian formed a major naval and air headquarters area, one of the most important in the Pacific for the Japanese, none of the islands had the defensive positions or trained personnel it should have had to withstand an amphibious assault. Japanese planners had not expected the threat to the Marianas so soon, because Saipan was a part of the inner defense perimeter, far from the front lines of early 1944. When the threat was realized, particularly after the first fast carrier raids, the Japanese began to mobilize forces for the defense of the Marianas. Army forces with their equipment and supplies were loaded in convoys for the Marianas and additional air power was staged in from the home islands, from the by-passed Central Pacific base of Truk and from Palau.

Although air reinforcements were fairly successful in reaching the Marianas, Army forces were not. By mid-1944, the American submarine war was raging at its height. Now, instead of a ship or two being lost on a long journey, entire convoys were being decimated by single submarines and groups of marauding submarines emulating the day-and-night, wolf-pack tactics of their German counterparts in the Atlantic. Many ships bound for Saipan and Tinian never made it; thousands of troops and hundreds of thousands of tons of weapons and supplies were lost at sea, which decisively weakened the defenses of the Marianas. Probably for the first time in the war, the contribution of U.S. submarines to the success of an amphibious assault was equally as significant as was the power of the covering naval forces and the grit and fortitude of the assault forces themselves. In the Marianas operations, submarines alone accounted for the great majority of the losses of supplies and reinforcements for these islands before the battle had begun.

American planning for the Marianas took into account the size of the land masses to be attacked; the American forces were beefed up to accommodate the larger size of the islands. Under Admiral Nimitz's direction from Pearl Harbor, the attacking force consisted of the 5th Fleet under Admiral Spruance, which included Task Force 58; the fast carriers and eight modern battleships under Vice Admirals Mitscher and Lee; and the Joint Expeditionary Force (amphibious assault force) under Vice Admiral Turner. This group comprised some 535 combat ships ranging from battleships and carriers down to landing craft. They would put 127,571 assault troops, 4-1/2 reinforced divisions, on shore at the two amphibious beachheads on Saipan and Guam. D-Day would be June 15, 1944,

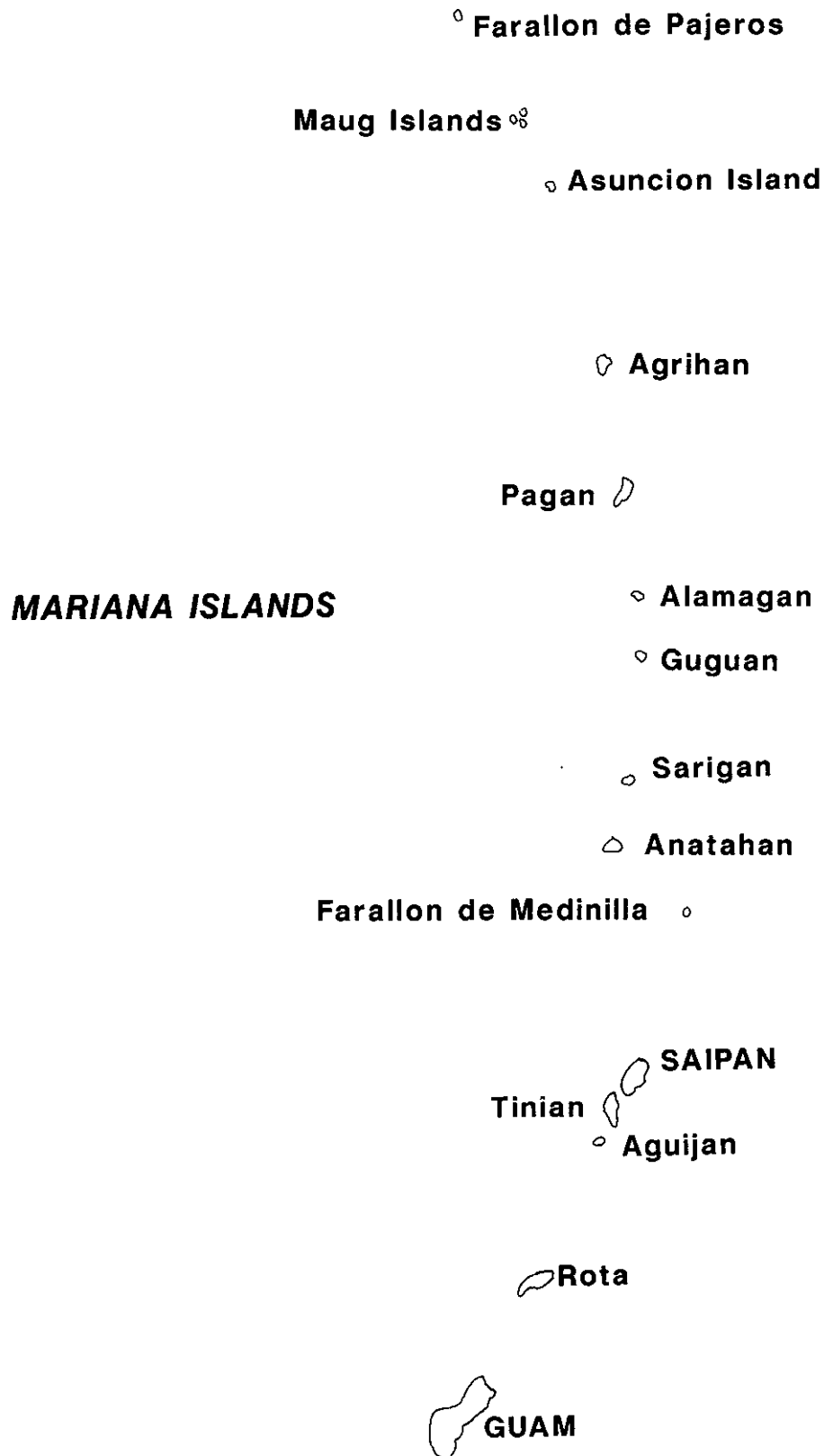


Fig. 6.8. The assault on the Mariana Islands began with preliminary air strikes on Guam, Saipan and Tinian in June 1944.

just 10 days after the invasion of Normandy, half a world away. In support of the assaulting naval forces would be the Service Force; Pacific Fleet, under Vice Adm. William Calhoun; a supply group capable of maintaining both the 5th Fleet and amphibious forces at sea for weeks. Also in support were the land-based aircraft of Vice Adm. John Hoover's Forward Area Central Pacific, operating from island bases recently in Japanese hands; and, last, the submarine forces in support of the Marianas operation.

Such was the fortune of materiel power for American forces in June 1944 and misfortune for the Japanese. The Japanese would respond with the same ferocity, tenacity and single-minded purpose on the battlefield. The result, against overwhelming odds, was entirely predictable; the cost in blood was not, and it would be high.

General Holland M. Smith, U.S. Marine Corps, was in command of the assault forces, which consisted primarily of the 2nd and 4th Marine Divisions, the 3rd Amphibious Corps and the U.S. Army's 27th Infantry Division under Lt. Gen. Ralph Smith, U.S. Army. These forces were divided into a northern attack force (TF-52) bound for Saipan, a southern attack force (TF-53) bound for Guam, and a floating reserve supported by seven escort carriers. Amphibious forces for the assault staged from Guadalcanal, Hawaii, Kwajalein, Eniwetok and Majuro, beginning on May 29, 1944.

Beginning in early June 1944, American forces gathered at sea with Task Force 58 taking the point. During the approach to the Marianas, Army land-based air forces staged interdiction raids against Peleliu, Yap, Woleai, and Truk and American intelligence began to pick up information that the Japanese were executing their plan to deploy major naval forces in defense of the Marianas. Whatever forces the Japanese sent, they would have to face 7 heavy and light carriers with over 800 aircraft, 8 modern 16-inch gunned battleships, 8 heavy cruisers, 6 light cruisers, 4 anti-aircraft light cruisers and 66 destroyers before even reaching the amphibious forces, which had 10 escort carriers (3 with the fueling group), 8 old battleships, 6 heavy cruisers, 5 light cruisers, 68 destroyers and 20 destroyer escorts of their own.

The Japanese were well aware of the materiel superiority of the United States at this point of the war; however, it is doubtful that even the most pessimistic Japanese staff planner could have predicted they would have to engage 223 major warships in order to defend the Marianas and chase the invaders back into the sea. The basic Japanese plan was, in part, dictated by Task Force 58. Japan would have to use the nine remaining fleet and light carriers from an advantageous lee position east of the Philippines and west of the Marianas

in order to launch massive air strikes against the American carrier forces. These carriers and their escorting warships were on the move in early June but not in time to prevent the initial landing on Saipan, first of the American targets.

Saipan Invasion, June-August 1944

Preliminary strikes on Guam, Saipan and Tinian commenced June 11, 1944, when 216 aircraft from Task Force 58 hit all three islands, caused major damage to facilities, destroyed some 30 aircraft and sunk over 30,000 tons of shipping. These strikes continued against all the Mariana Islands for the next two days when the surface bombardment forces moved in.

Initial shore bombardment was conducted by the newer battleships detached from Task Force 58 on June 13, 1944. This bombardment was relatively ineffective due to limited practice by the crews, and the older battleships took over the next day. All told, 79 16-inch rifles and 72 14-inch rifles were employed in the bombardment, supported by the 8-inch, 6-inch, and 5-inch guns from the cruisers and destroyers. Japanese communications were wrecked by this continuous shelling, and there was considerable damage to bunkers, caves, trenches and gun emplacements.

Underwater demolition teams (UDT) worked over the landing beach approaches on June 14, under cover of the naval bombardment group. By evening all was in readiness for the morning's assault as ships of the Northern Attack Force made a nicely-timed approach to the landing areas off Saipan. Lieutenant General Saito, Lieutenant General Obata, Vice Adm. Chuichi Nagumo (demoted from sea command following Midway and the Guadalcanal battles) and Vice Admiral Takagi with their 31,629 fighting men on Saipan had their work cut out for them.

D-Day, June 15, 1944, on Saipan went much as the Americans had planned. Despite all preliminaries, resistance was stiff as landings took place on a two-division front along Saipan's southwest coast (Figure 6.9). The initial waves of assault vehicles and troops hit the beach at 8:44 a.m. and within minutes over 600 landing craft had deposited troops on every beach. Eight thousand Marines reached shore in the first 20 minutes, which provided a beachhead broad and deep enough to allow for later deployment, not unlike the Normandy landings. Although the landings were successful, the Japanese, with plenty of surviving field weapons, prevented any rapid advance. The first day's planned advance line was not captured for 3 days. By the end of the first day's fighting, some 20,000 troops were ashore, and it was obvious to all present that Saipan was not going to be easy. Early

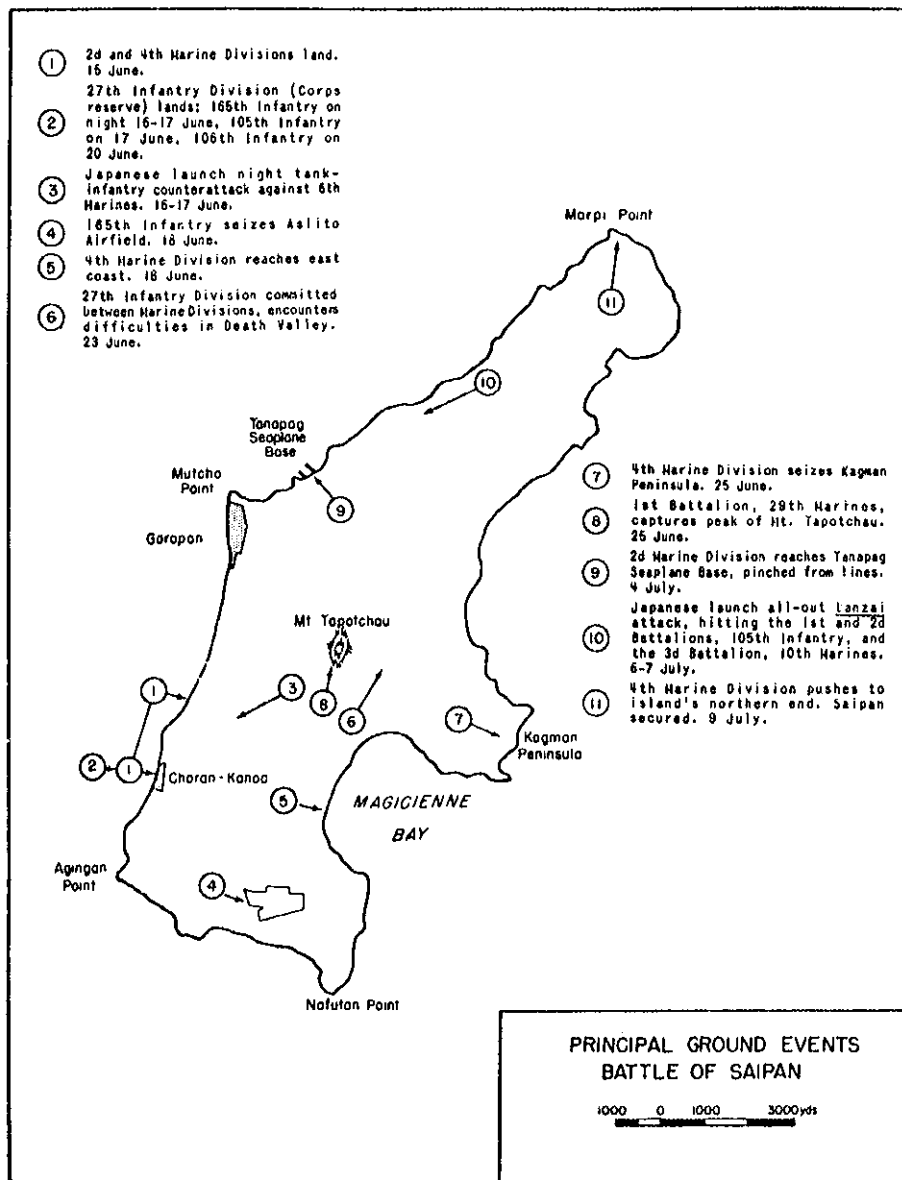


Fig. 6.9. The battle to capture Saipan continued from June 15 to August 10, 1944, when the island was declared secure.

in the morning of June 16, Japanese troops unsuccessfully counterattacked the Marine lines several times and sustained losses of more than 1,000 dead.

Vice Admiral Turner, commanding the amphibious forces, originally set June 18, 1944, as the day for the assault on Guam, based on the progress on Saipan. These plans changed when definite word of approaching Japanese warships reached Admiral Spruance from scouting submarines. The Guam landings were postponed, and the decision was made to commit the 27th Infantry Division (reserve units) to Saipan because the fighting there was obviously going to be tougher than anticipated. American naval forces began to deploy for the upcoming carrier battle.

While the battle of the Philippine Sea was taking place to the west between massed carrier forces, the bitter fighting on Saipan continued unabated until August 10, 1944, when the island was declared secure. The long fight up the island claimed thousands of civilian casualties including those who killed themselves jumping off the cliffs at Marpi Point. American forces buried 23,811 enemy troops, with uncounted dead sealed in caves and bunkers. U.S. forces sustained casualties of over 3,000 dead and 16,500 wounded. The capture of Saipan, and of Guam and Tinian to follow, was to prove catastrophic for the Japanese. On July 18 when the loss of Saipan was announced to the Japanese public, the Japanese government collapsed. Gen. Hideki Tojo, who had headed the Japanese government and military for so long, resigned in disgrace. The change was a political admission of defeat, but the war would drag on for another year because no one in Japan was willing to risk the wrath of the Japanese Army's political machine by proposing peace.

The Battle of the Philippine Sea, June 1944

Japanese forces assembling for the Marianas battle were commanded by Vice Adm. Jisaburo Ozawa. Now called the Mobile Fleet, the naval forces were headed by nine aircraft carriers in three divisions: Carrier Division 1 (CARDIV 1) was composed of the carrier TAIHO, largest in the fleet, and SHOKAKU and ZUIKAKU, both veterans of Pearl Harbor. CARDIV 2 consisted of JUNYO and HIYO, light carriers converted from merchant hulls, and RYUHO, a naval auxiliary conversion. CARDIV 3 included CHIYODA and CHITOSE, naval conversions of seaplane carriers, and ZUIHO, also an auxiliary conversion. Only the first division had heavy fleet carriers; the rest, smaller merchant or naval auxiliary conversions, carried fewer aircraft and were far less effective warships. The carriers were augmented by the usual heavy support forces, including MUSASHI, YAMATO and other fast battleships, as well

as heavy and light cruisers and destroyers. Japanese planning included support from some 500 land-based aircraft staging into the Marianas. However, the great majority of these aircraft never saw combat because they were cut down by American carrier aircraft before and during the battle, a fact Admiral Ozawa was unaware of until far too late. Twenty-five Japanese submarines were also deployed to support the advancing carrier forces, but at least seventeen were sunk and the rest proved ineffectual.

The Japanese forces, sortieing from Tawi Tawi and the home islands on June 13, 1944, were promptly reported by U.S. submarines who tracked their progress through the Philippines and east toward the Marianas. Ozawa expected to utilize three tactical advantages: land-based air support, the superior range of his aircraft (as compared to American), and the lee gauge of sailing into the easterly wind, which meant he would not have to turn away from the battle center in order to launch or recover aircraft as the American position would require for TF58. These advantages were more than offset by the lack of experience on the part of Japan's naval aviators. Ozawa's best carrier division pilots had only six months of air operations training when it sortied for battle.

Air search was critical to this battle and in this respect the Japanese had the advantage. The location and disposition of the Japanese fleet was a problem for the Americans throughout the battle, primarily because Admiral Spruance elected to keep TF58 within covering range of the Marianas, lest the Japanese split their forces for an end run as they had done so often in the past and would do again at Leyte. This served to keep the American carriers too far east of Ozawa's position for American reconnaissance to locate the Japanese carrier before they launched the first attacking waves. For once the Japanese were using a tactical disposition similar to that used by TF58: keeping their carrier groups together; there was no plan to divide forces in a pincer movement as Spruance feared.

By the early morning hours of June 19, 1944, Ozawa reached his planned position and launched the first strikes. Task Force 58, situated between Ozawa's fleet and the Marianas, received air attacks from Guam early that morning but, despite the best Japanese efforts there were only about 50 operational aircraft on Guam, not the 500 Admiral Ozawa was told would be available. The U.S. fast carriers had over 450 fighters available and they kept the task force from any damage from the direction of Guam. While TF58 fighters were dealing with the land-based planes, Admiral Ozawa launched the first of four raids; the Japanese fighters were picked up on the TF58 radars by 10:00 a.m. on June 19 while more than

150 miles from their targets. Every available fighter plane was launched to engage in what became known as the "Great Marianas Turkey Shoot." Ozawa's forces lost well over 300 aircraft to TF58 while damage to the American fleet did not stop a single ship.

While the American fighters stopped Ozawa's attacks, two U.S. submarines found Ozawa's carrier forces. ALBACORE put a torpedo into TAIHO, which caused fuel tanks to leak. Inept damage control compounded the problem and TAIHO blew up and sank with heavy loss of life. TAIHO, newest and largest carrier in the Imperial Japanese Navy, had been in commission only about four months. Submarine CAVALLA found SHOKAKU the same day and hit it with four torpedoes. The veteran of Pearl Harbor, Coral Sea and the Guadalcanal battles rolled over and sank. By sundown on June 19, Ozawa's forces were defeated, with two fleet carriers gone and their air groups decimated. The remaining carriers proved ineffective for the rest of the battle.

Ozawa's forces withdrew toward their planned fueling rendezvous on the evening of June 19, 1944, and two hours later TF58 finished recovering aircraft and turned west in pursuit. Because of their relative positions, Ozawa's forces were not sighted until a pilot from ENTERPRISE found them at 3:40 p.m. on June 20. Admiral Mitscher launched everything he had late in the afternoon while fully realizing his fliers would have to return after dark. They located the Mobile Fleet at 6:40 p.m. and attacked immediately, sinking the carrier HIYO and damaging other carriers. One tanker was sunk and two destroyers were lost. The strike aircraft flew back in the dark and many were forced to ditch before reaching the carriers; many others went into the water while attempting to find a carrier to land on after finding the task force, even though Admiral Mitscher ordered the fleets' lights turned on. Losses in aircraft were high but many of the pilots and crewmen were recovered.

By June 21, 1944, American forces were retiring east to a fueling rendezvous, and the decimated Mobile Fleet was heading for Okinawa. The Battle of the Philippine Sea was over. Many historians have suggested that the U.S. forces should have been used more aggressively and the Mobile Fleet closely engaged and destroyed by the American fast carriers and battle line. Despite this criticism, Spruance's more conservative tactics resulted in successfully accomplishing the mission, which was to protect the Marianas assault forces and the continuing amphibious operations there.

Guam Invasion, July-August 1944

The invasion of Guam was postponed because of the Battle of the Philippine Sea and because of the unexpectedly stiff resistance on Saipan, which required committing the reserve 27th Division. It was also suggested that it would be wise to use an extra division of troops to take Guam. The size and terrain of Guam made it obvious that it would be tougher to take than Saipan, because Guam has more mountainous areas with cliffs, shelves, benches and valleys ideally suited to the Japanese style of interlocking-fire defense. The Army's 77th Division was available and was brought in for the landings scheduled for July 21, 1944.

Although the delay in landing on Guam provided considerable benefit to the Japanese defenders, about 19,000 fighting men under Lieutenant General Takashima, it also "...gave United States forces a chance to deliver the most intensive and prolonged prelanding air bombing and naval bombardment that any Japanese-held position ever received..." (Morison 1951(VIII):374). Troops in the Guam assault were the 3rd Marine Amphibious Corps, which consisted of the 3rd Marine Division and 1st Provisional Brigade, and the Army's 77th Division, all under Major General Roy S. Geiger, USMC.

During the fight for Saipan, Guam was not ignored; air bombardment and general harassment by carrier aircraft and surface bombardment were scheduled whenever possible. The serious work started on July 8, 1944, when Vice Admiral Conolly's bombardment group moved in to begin systematically working over Guam. Assisted by aerial photography and interpretation, the battleships, cruisers and destroyers continued shelling day and night for 13 days. According to the naval gunfire reports on the action, 6,258 rounds of 14-inch and 16-inch ammunition, 3,862 rounds of 8-inch, 2,430 rounds of 6-inch and 16,214 rounds of 5-inch were expended in a 6-day period. This did considerable damage on Guam and certainly lessened casualties in the landing force, but it was not enough even though Marine liaison with bombardment forces was much closer and more thorough than had been the case in the past.

Bombardment of positions on Guam continued while the assault forces approached, and the sustained fire became heavier and more concentrated as W-Day neared. Battleships delivered main-battery fire on July 19, 1944, and the continued operations of the beach-cleaning UDTs gave the Japanese their clue that the landings would be on the Asan and Agat beaches. By the morning of the landings, 6 battleships, 8 heavy and light cruisers, 32 destroyers and 3 escort carriers were engaged in a prelanding bombardment that, according to Japanese sources, destroyed all the coast defense

emplacements in the open and about half the hidden ones, as well as about half the smaller emplacements inshore of the landing beaches. Such continuous bombardment also had its effect on the defenders' morale.

"W-Day" at Guam was July 21, 1944; the plan called for a split landing north and south of Orote Peninsula at Asan and Agat on Guam's western coast. By 6:00 a.m., all assault forces were in place and the troops and naval forces formed up to hit the beaches; the first waves touched shore at 8:30 a.m. Within six hours the entire assault division on the Asan beachhead was ashore. At the Agat beachheads to the south, resistance was much tougher and the unloading slower.

The Marines on the Asan beachhead had a long row of low cliffs to face and at Agat, Marine and Army units faced steep hills and undestroyed Japanese emplacements. All U.S. forces faced intense return fire from light and medium artillery, machine guns, and the rifles of the Japanese troops. The battle was vicious right from the landing beaches, but by July 28, 1944, the two landing forces had united east of Orote and were preparing a "breakout" to sweep the rest of the island. During the intervening days, both landing forces withstood several massed Japanese counterattacks. Following one particularly intense assault near Asan, 3,500 Japanese bodies were counted. These battles broke the back of the Japanese defenders. Generals Sigematsu and Takashima were killed in early fights, and General Obata, who just happened to be on the island, assumed command of the remaining forces. When General Obata took control, he had no tactics left but a fall-back defense, which was employed with not surprising skillfulness.

Orote Peninsula, with its airfield and remains of the old Marine barracks, was in American hands by July 29, 1944, although there remained the dangerous cave-cleaning duty. The American flag flew over the old Marine parade ground at 3:30 p.m. that day, for the first time since December 10, 1941. Between July 29 and August 10, Marine and Army forces took the remainder of Guam, killing or capturing over 19,000 Japanese. On August 15, occupation forces took over and the ships and assault forces departed. Several thousand Japanese remained at large in the jungles of Guam and attempted to fight a guerilla war. Guam remained dangerous until after the Japanese surrender. Even after the war, holdouts remained to wander out of the jungle and surrender or be captured for many years after the war.

Tinian Invasion, July-August 1944

Tinian, 5 miles wide and 10 miles long, lay close enough to Saipan to require its capture, unlike Rota and Aguijan, which were not occupied by American forces until the Japanese surrender (refer to Figure 6.8). Tinian's proximity to Saipan could have made it a nuisance once Saipan was developed as an American forward base. Further, Tinian had an operational air base and three more under construction and its flatter terrain made it ideal for B-29 bases.

American planning for the capture of Tinian called for a shore-to-shore operation using the same 2nd and 4th Marine Division troops employed on Saipan. Maj. Gen. Harry Schmidt was selected as overall commander for ground operations on Tinian, and extensive bombardment by air and surface forces was started before the invasion. Operational plans for the assault were issued on July 13, 1944. J-Day was July 24, and troops landed on two narrow beachheads on the north coast, where a landing was least expected. Japanese forces on the island comprised about 9,000 Army and Navy personnel under the command of Col. Kiyochi Ogata, although the senior officer on Tinian was Vice Adm. Kakuji Kakuta.

Tinian was invaded on schedule, the first waves of assault troops hit the narrow beachhead at 7:55 a.m. on July 24, 1944. Expanding the beachhead to accommodate the landing was a top priority as troops fought inland. Although there was a tenacious Japanese defense, Tinian was overrun and secured in nine days, one of the most successful operations of the war. Tinian was declared secure on August 1; however, mopping up took three more months for an entire Marine regiment. U.S. forces suffered 389 killed and 1,800 wounded compared with over 5,000 Japanese known killed and 250 prisoners taken. The other 4,000 troops probably died in sealed-up caves, although a few may have escaped. As planned, Tinian was quickly developed into a massive base to support B-29 operations against the Japanese homeland. Both atomic bombs were delivered from Tinian.

As the fighting for Guam and Tinian tapered off, the logistics fight was just beginning. The Marianas were turned into massive forward bases for the military, with the B-29 airfields receiving top priority. Admiral Nimitz moved Pacific Fleet Headquarters to Guam as did Admiral Lockwood for the submarines. Apra Harbor was enlarged and rebuilt along with the airfield at Orote Point while other air base complexes rose all over Guam, Saipan and Tinian. Support and logistics organizations also continued with supply bases, motor pools, magazine areas, rest and recreation facilities, hospitals and other facilities springing up wherever needed.

The naval and land victory in the Marianas is often characterized as the decisive battle of the Pacific War. This view was advanced in some of the biographies and autobiographies of participating commanders, such as General Holland Smith. Indeed, the Marianas battle was the definitive break into the Japanese inner defense perimeter, and it poised military forces in the ideal position for killing strikes into the Japanese inner empire, regardless of the Japanese forces now remaining in the Philippines, Formosa, Okinawa and other areas. This battle also split the Japanese Empire in two. Submarines operating from Guam could continuously attack the natural bottleneck in all Japanese ship traffic in the Western Pacific--the Luzon Straits north of the Philippines. This effectively severed the Japanese homeland from the oil resources to the south, which had been one of Japan's main reasons for going to war. The Philippines became vulnerable to attack and could be cut off from the rest of the empire.

The Marianas battle can be considered decisive because of the geographic position in which it placed attacking American forces and because it stripped the remaining Japanese carriers of their aircraft. This had disastrous results in the next naval battle at Leyte Gulf. The elements for a U.S. victory were in place, but a year of war remained that would see bitter and sustained fights with ever-increasing casualties at sea and on land.

The strategic consequences of the Marianas battle should be tempered with this thought in mind. Decisiveness in war is relative to long-term results. In this respect Midway, where a lone pilot from ENTERPRISE made a decision to turn north; Guadalcanal, where Col. Merritt "Red Mike" Edson and his Marines held a small ridge against the best the Imperial Japanese Army could offer; and New Guinea's Kokoda Trail, where mostly Australian troops fought a retreating but ultimately victorious battle against better-equipped and superior forces must also be considered decisive battles. These battles were fought with backs to the wall, little hope for sufficient supplies and equipment, little support from home other than deepest sympathy, inadequate intelligence and communications, and mostly against superior forces. These were the truly decisive battles. After these, for the Americans, there was nothing but victory; for Japan, only defeat.

If the battles of 1942 opened the doors to the Pacific, the Marianas battle closed them on a Pacific Ocean that was now the property of the United States. With MacArthur's combined military forces completing their long climb across the north coast of New Guinea, all Pacific forces could be united in future operations, the main target being the Philippines.

But before the enormous land mass and large armies in the Philippines could be tackled, military planners had decided one more island would need to be taken to protect the American flank on its approach to the Philippines--Peleliu, in the Palaus, last and by far the most difficult of the Central Pacific bastions to fall.

End of the Line in the Central Pacific

Palau had been a Japanese possession since October 1914 when a Japanese occupation force came to Koror Island. The Japanese quickly established firm administrative control over the islands, more so than on many of the other mandated islands, and began limited defensive military development. Major harbor facilities at Malakal and an airfield at Peleliu along with a seaplane base at Arakabesan were the extent of military facilities at the outbreak of the war. Fishing, phosphate mining and scientific study had occupied most of the Japanese administration of the islands as war approached.

During the early part of the war, Palau served as the jumping-off point for a small carrier task force that assaulted the southern Philippines at Davao. Assault troops for the Mindanao invasion were also staged through Palau, and the area would remain a critical link in the Japanese supply routes from Saipan to the south in New Guinea and east toward Truk.

For eighteen months after the surrender of the Philippines, the Palau area command continued in the role of an intermediate staging ground for Imperial Japanese troops engaged in the hard-fought battles in New Guinea and the Solomons. Infantry and artillery units used the Palaus as training and practice grounds before being sent to the southern fronts. The excellent harbor of Malakal provided safe anchorage for ships involved in the desperate struggle for Guadalcanal. Koror was also a major supply base for the forward areas (Gailey 1983:7).

Palau also had air bases on Peleliu and Babelthaup for protecting the islands and as staging areas for aircraft en route to the Southern and Central Pacific battlegrounds. Palau was also used as an amphibious training ground for various military units. It was the potential threat from

these air bases that figured heavily in American planning for the capture of the Palaus following the Marianas operations.

As with other bases in the Central Pacific, the Japanese had not really given much thought to heavily fortifying the Palau bases before the war or even early in the war. The Japanese were apparently far more interested in offensive operations to ensure capture and consolidation of the oil-rich southern areas than in strong defensive fortification of their existing major Central Pacific bases. It was not until September 1943 that serious consideration was given to improving the defenses of the inner defensive perimeter, particularly in Palau and the Marianas. Even then, defensive planning was based on Japanese intelligence interpretations of U.S. military potential; even the most pessimistic Japanese planning analysis could not have predicted that the U.S. Navy alone could more than double in size in a year (in terms of warships afloat, at least). Defensive planning for the Palaus was, as for most of the Central Pacific, too late and too little, a fatal mistake that only became apparent when the U.S. Navy's Task Force 58 first ripped through the Central Pacific in February-March 1944.

The Japanese Army, always in control of overall military planning during the war, considered General MacArthur's campaign in the New Guinea area as the most dangerous threat to the Japanese defensive perimeter. As a result of this assumption, Japanese naval airpower in the Central Pacific was sent south to counter this threat, just in time for the U.S. Navy to hit the Marianas with Army and Marine assault troops. U.S. naval maneuvers in the Central Pacific were so rapid and extensive they foiled adequate defensive planning. Both prongs of the U.S. effort were equally dangerous to the Japanese Empire and could not be adequately defended against. Quite simply, they did not have the resources available, a consequence of the Japanese Army's continued insistence on the China campaign in the face of the appalling losses of men and material in the Pacific theater up to 1944.

By September 1944, the stage was set for Palau (Figure 6.10). The Marianas were in American hands and the inner defense perimeter broken; MacArthur's forces had wrapped up the New Guinea campaign and were preparing for the Philippines operation, which would see the two-pronged Pacific offensive united into one. American planners, looking ahead to the Philippines, naturally assumed that the Western Carolines would have to be taken in order to secure the right flank of the Philippine invasion, which was originally planned to start at Mindanao rather than the eventual target, Leyte. Peleliu was perceived as a threat to any amphibious landing on Mindanao; however, the fact was that Palau did not have sufficient air forces to defend

itself, much less the Philippines some 500 miles to the west.

Whether or not American intelligence estimates made accurate summations of the Japanese capabilities in Palau in mid-1944 has been part of the controversy surrounding that operation since the first postwar histories were written. It is apparent that good intelligence about Palau was overlooked or ignored by the senior American planners and others. The result was the surprising ferocity of the battle of Bloody Nose Ridge during the ground fighting to take Peleliu. If those in command of the American offensive had taken a harder look at the situation, it is conceivable that Palau would have been isolated and bypassed like Truk. It also indicates that American planning was overconfident, in too much of a hurry, and defective in many respects, which cost many lives.

The overconfidence is not surprising, considering how the Marianas had been effectively steamrollered, but this overconfidence was in large part due to the massive increase in men and materiel available in the Pacific. The force became so massive, in fact, that after the Marianas campaign the fleet, its supply and logistics train and supporting amphibious forces began to reach the limits of effective control. Fortunately, this would never be too serious a problem, although it had its effect at Leyte and Samar. Contributing to this was the fact that planning for the Palau operation was scattered among several commands in several areas, and senior commanders, who would be in charge of the assault operations, were still involved in finishing the Marianas operations and were not as directly involved in the planning stages for Palau as they should have been. Historical accounts also indicate that some of the senior officers were not the best of friends and did not work as well together as had been the case in the past.

Planning for the Palau invasion considered many possible targets, finally settling on Peleliu (the main attack) Angaur, Ulithi and Yap, although Yap was dropped at the last minute. Operation "Stalemate," as the Palau operation was named, involved the 1st Marine Division and the U.S. Army's 81st Infantry Division with their attached units totalling more than 43,500 officers and men. They faced over 10,000 men, primarily from the Japanese Army's 14th Division, originally part of the Kwantung Army in China. This four-to-one advantage was illusory, however, because the fighting would involve about even numbers on both sides, a situation "...that should have made even the most optimistic planners shudder" (Gailey 1983:23). The poor use of intelligence data, complex logistics, and lack of cooperation among some commanders and their planning staffs, among other factors, combined to make the fight for Peleliu as bad as it could be.

Peleliu and Angaur were the recipients of the Navy's much-practiced, and therefore much-improved, close-in fire support from the battleships and prelanding aerial assault from both the big fast carriers and the smaller escort carriers assigned to the assault. Vice Adm. Jesse Oldendorf's fire support group included 5 old battleships, 4 heavy cruisers, 4 light cruisers, 9 to 15 destroyers and 7 to 11 escort carriers. As before, it would never be enough against a well-dug-in enemy.

When the American fast carrier task forces again raided Palau just prior to the invasion, they discovered that there was still merchant shipping in Palau's many harbor areas. During the attacks, aircraft from ENTERPRISE and FRANKLIN took on some of this shipping:

The Japanese knew that the favorite prey of the blue planes was ships, ships which could reinforce, resupply or evacuate. So he set airplane traps baited with ships.

As soon as the first aircraft was well committed in its dive, the ships and the woods on all the surrounding islands began to smoke and sparkle with automatic weapons fire. Lead laced back and forth across the attacking formation ... pilots and gunners returned the fire.

Rockets, bombs, and strafing had no real effect on the shipping: "...nothing happened. The ships could not sink. They were already sunk, resting on the bottom in the shallows, holed and finished by previous attacks, now only machine gun nests and AA emplacements ringed by other machine gun nests and AA emplacements" (Stafford 1962:393-394).

Palau and Ulithi Invasion, September 1944

The invasion forces for Palau staged from Hawaii and the Solomon Islands beginning on September 4, 1944. While these slow-moving units were at sea, the planning for Palau changed again as a result of information from Admiral Halsey's Task Force 38. After hitting the Philippine Islands, Task Force 38 operations showed the Philippines to be far more weakly defended than presumed. Halsey sent a message to Nimitz at Pearl Harbor, in which he recommended dropping Palau and Yap

from the invasion list and moving up the invasion of the Philippines. After consulting with the Joint Chiefs of Staff then attending the Octagon Conference in Quebec, Nimitz dropped Yap from the invasion timetable and the Philippines invasion was moved up. However, Nimitz did not drop the Palau plan; Peleliu, Ulithi and Angaur would still be attacked, the rationale being that the Palau invasion forces were already at sea.

Lt. Gen. Sadae Inoue, commander of the Japanese 14th Division and of Palau, was stationed on Koror Island. Both he and his chief of staff, Colonel Tada, were of a mind to incorporate the lessons of previous island invasions in their defense plans. Defenses were prepared as much as possible, considering the pounding the various island bases had already taken from air assaults and the difficulty of moving in more men and supplies through the ever-increasing submarine blockade in the Western Pacific area. There would be no useless banzai charges or attempts to throw the enemy back into the sea at the beach. Defenses were designed to foil naval and air bombardment with deep caves that could protect front-line troops until they met the enemy on the ground. On Peleliu alone, over 500 natural and manmade caves were used.

The Palau defenders staged a "dogged holding action" (Gailey 1944:40) against the assault troops. On Peleliu, Colonel Nakagawa, commander of the 2nd Regiment, was obviously an officer of skill and professionalism; his defense of Peleliu chewed up one Marine regiment and brought it to a halt, something that had not occurred before in Central Pacific amphibious assaults. Colonel Nakagawa was assisted by Major General Murai, a fortifications expert, sent to Peleliu primarily to give the Army an officer of equal rank to the Naval commander on the island. Unfortunately, there was no real cooperation in the joint defense preparations at Palau.

Colonel Nakagawa's and General Murai's defenses centered on the southwest coast, which had the only realistically usable landing beaches on Palau, and on the Umurbrogel Ridge area, along Peleliu's west coast, where the Japanese had well over a year to prepare fortifications within the narrow valleys, cliffs and fault lines of the coral limestone ridges. The defending forces were understrength in heavier guns and mortars and many of the caves proved inadequate against the newer models of flame throwers but, overall, defenses were much more logically laid out and prepared than previously in the Central Pacific. Some 13,000 Navy, Army and civilian personnel were estimated to be on Peleliu by September 15, 1944, when the invasion began. Colonel Nakagawa had the native Palauans evacuated to Koror before the fighting started, another indication of Colonel Nakagawa's stature as a military officer.

The Palau operation began on September 12, 1944, when Admiral Oldendorf's fire support group of old battleships opened up on Peleliu and Angaur, interspersed with attacks from the aircraft of the escort carrier groups assigned to the invasion. By midmorning of September 12, underwater demolition teams were clearing the beach approaches and blasting paths through the coral. Palau had the most extensive and formidable offshore beach defenses of any of the Central Pacific islands, a result of Colonel Nakagawa's plan to try and destroy as many landing craft as possible before they could arrive at the beach. Beach preparations were quickly completed, but naval and air bombardment continued for the next three days.

By the morning of September 15, 1944, the landing forces were in position and the transports standing some 16,000 yards off the southwest beaches designated for the landing as White Beach 1 and 2 and Orange Beach 1, 2 and 3, all on the southwest corner of Peleliu. The landing force consisted of three Marine regiments, the 1st Regiment under the legendary Col. Lewis B. "Chesty" Puller, the 5th Regiment under Col. Harold D. Harris, and the 7th Regiment under Colonel Herman H. Hanneken. Naval and aerial bombardment of the beaches continued as the assault waves formed up and moved out:

Almost as soon as the advance LVTs departed the reef for the beach, they were brought under fire by Japanese light artillery and mortars from the area immediately inland from the beach and by heavy artillery concentrated in the highlands. Some heavy fire was later directed from the flanks along the entire length of the beach.

The first Marines landed on White Beach 1 at 0832, only two minutes behind schedule. Within four minutes troops were ashore on all the beaches and were met by heavy rifle, machine-gun, and mortar fire.... Some commentators have left the erroneous impression that Colonel Nakagawa surrendered the landing area without a struggle. Nothing could be further from the truth, but he had designated only approximately 1,200 men to his westward defense region, preferring to use the majority to defend the highlands in order to make the capture of Peleliu as costly as possible for the attackers. The primary targets

for the Japanese were the landing craft (Gailey 1944:68-69).

Nakagawa's defense was successful. Later reports estimate that more than 60 landing craft were damaged or destroyed at the beaches, and it was obvious from the moment troops were ashore that the fight at the beachhead was to be as bad or worse than at Tarawa, although the landings did go almost as planned despite the intense and devastating fire directed at the beach.

Peleliu, with its daytime temperatures over 100^o, high humidity, and lack of water became pure hell for the Marines even without the presence of the Japanese, whose defense exceeded that of any previous engagement. By the end of the second day of fighting, U.S. forces had a beachhead some 3,000 yards long and 500 yards deep and were engaged in a life-and-death struggle along every inch of it, with over 1,100 battle casualties, including 210 killed.

Much of Colonel Nakagawa's defense system was destroyed in the first two days; the Marines would not be tossed into the sea. They would not walk over the rest of the island, either. Fighting occurred on every part of Peleliu where the Marines advanced. Eventually, the battle became an inch-by-inch struggle through the Umurbrogel Highlands, part of which was the aptly named Bloody Nose Ridge. By the last week of September, "...nine tenths of the island had been captured and an estimated 9,000 Japanese had been killed" (Gailey 1944:155). Yet, despite all this, the strongest defensive pockets still remained on the ridge. Fighting was so intense and casualties so high for the 7th and 5th Marine Regiments that the senior commanders had to scramble to get fresh men ashore, mostly Army troops who had previously been involved in other operations or held in reserve.

Although Peleliu was declared "secure" on September 27, 1944, this was command bravado on the part of the Marines. Ground defense, for example, was not handed over to base command (nonassault garrison forces) until January 1945, and Japanese survivors continued to be a dangerous problem up to the end of the war. By October 1944, however, only a pocket some 300 by 450 yards was still held by about 1,000 Japanese defenders, including the brilliant Colonel Nakagawa and General Murai. Getting to this final point had cost the 1st Marine Division almost 7,000 casualties, including 1,300 killed.

The final phase of the Peleliu fight belonged to Army units of the 81st Division in relief of the Marines. By November 24, 1944, Army units broke the final pocket of resistance, Colonel Nakagawa and General Murai committed suicide, and the

remaining 120 Japanese defenders did the same or died in battle. By November 27, all was quiet on the Umurbrogel, two and one half months after the initial assault. Army units of the 81st Division suffered over 900 casualties and 110 killed in the final assaults on Peleliu while killing some 1,500 of the remaining Japanese defenders.

While the fight for Peleliu raged, Angaur and Ulithi were captured by regimental combat teams of the U.S. Army's 81st Division. Ulithi was undefended, and easily occupied by the 323rd Regimental Combat Team. Ulithi, a major lagoon area, was the best and most useful prize in all of Palau and became the major forward replenishment area for the U.S. Navy for the remainder of the war, a critically important staging point for all future U.S. Naval operations in the Philippines, Formosa, Okinawa and the Japanese homeland.

The 321st and 322nd Regimental Combat Teams assigned to Angaur had a much tougher time of it against Major Goto's defending forces who, as usual, organized their defenses around the principle of making the operation as costly as possible for the attackers. Army landings commenced on September 17, 1944, with the troops fighting the same fanatical enemy and the same heat and humidity found at Peleliu. By October 19, the last Japanese position was overrun, the commander killed and mopping up of stragglers begun. U.S. forces suffered some 260 men killed with over 2,000 wounded or incapacitated by disease; almost 1,400 Japanese were killed.

Capture of Peleliu, Angaur, and Ulithi closed the campaign in the Central Pacific. U.S. forces now had control of the sea and air in this critical area, with major land bases and naval replenishment areas well secured despite the fact that the Japanese retained possession of islands like Wotje, Truk and Babelthuap. These bases did not surrender until the end of the war. Beginning with the first invasion in November 1943, it had taken only about a year to tear the Central Pacific from the Japanese Empire. This speaks volumes for the power and ability of the U.S. Navy, Marine Corps and Army.

After the close of the war, the remaining Japanese-occupied islands of the Central Pacific quickly surrendered to American naval forces and all Japanese were repatriated. Most of the islands returned to their peacetime existence, but not all of them. Kwajalein remained an active military base first for the postwar atomic tests and later as a missile test area, and Guam continues in the role of a forward naval base.

The many hundreds of shipwrecks throughout the Central Pacific are a testament to the rapid and violent collapse of the Japanese island empire. The historical and cultural significance of these ships will always be tied to the politics that led to war in the Pacific islands and to the type of warfare fought in the area.

The artifacts of war in the Central Pacific have gradually been disappearing as a result of both the inevitable actions of the sea and the actions of man. Following the war, much material was salvaged for scrap or other uses, such as the Japanese salvage of TONAN MARU NO. 3 at Truk, and many ships were blown apart to clear harbor anchorages and entrances. Concurrent with this type of activity was much postwar dumping of materiel and equipment into the sea, such as wrecked landing craft, stripped aircraft, machinery and supplies. When the Americans packed up and cleared out of many areas, even usable material was disposed of at sea, as it was not worth the trouble to haul home--part of the bitterly expensive waste of war.

Rebuilding and expansion of villages into towns and towns into cities has contributed extensively to obliterating the remains of World War II on many islands, which leaves only the material in the oceans as a relatively intact and undisturbed record of the war years in the Central Pacific.

These fragile and deteriorating remains at sea are the best resource for archeological and historic research associated with this period. As such, they merit the protection and management necessary to preserve them for future research without the threat represented by unthinking sport diving or, in the case of deep-water wrecks, exploitation diving with advanced technology.

Much undoubtedly still remains to be discovered of the World War II wrecks in the Pacific, and even the smallest details of these wrecks--ships and planes, Japanese and American alike--will make a contribution to understanding the sacrifice and the violence of the Pacific war.

CHAPTER VII.
POST WORLD WAR II, THE NUCLEAR AGE TO PRESENT

By Toni L. Carrell

Introduction

The islands of Micronesia came under temporary military government as each was liberated. The American island commanders had officers specially selected and trained to improve the welfare of the newly-liberated civilians and maintain public order. Distinctions were quickly made between the various island ethnic groups; most were treated as innocent victims or, in the case of Japanese civilians, rounded up and treated as harmless enemies.

After V-J Day, the role of the American military officers was formalized. They were given the task of administering the numerous bypassed and recaptured islands. For the previous five years thousands of Japanese, British and Americans fought and worked in these islands; they displaced native populations, introduced new materials and ideas, and upset island economies and tribal relations. When the surrender teams put in at islands that had been bypassed, such as Truk, Ponape and Koror, they found want and devastation among both Japanese and natives.

Efforts were immediately made to repatriate all Japanese and Okinawan civilians and return islanders to their homes. Most islanders needed medical help, many of their homes and other buildings were in ruins, their boats destroyed, lagoons and reefs depopulated of fish from the bombings, livestock killed, and their gardens and groves devastated and threatened by pests.

Rapid demobilization and the general disintegration of all communication and supply facilities created additional problems. Inexperience and lack of long-range administrative goals resulted in continued chaos and little stability in the years immediately after the war.

Trust Territory of the Pacific Islands

For two years following the war, the islands' status was in limbo. Then, in 1947, the United Nations responded to considerable pressure and agreed to place the islands into a trusteeship, the only such instance where the basis was strategic importance. The legal status of the United States Trust Territory of the Pacific Islands was based upon an agreement between the United States and the UN Security Council; the agreement took effect July 19, 1947.

U.S. President Harry S. Truman delegated authority for the civil administration of the territory to the Secretary of the Navy on an interim basis. Vice Adm. Louis E. Denfield was named the first high commissioner of the territory, headquartered in Hawaii, and Rear Adm. Carleton H. Wright was appointed deputy high commissioner, headquartered in Guam. In 1951 the administration of the islands passed to the U.S. Department of the Interior. In 1953, however, all of the islands in the Marianas, except Rota, were returned to the control of the Navy Department for "security" purposes.

This situation continued until mid-1962 when control reverted to the Department of the Interior, and the Northern Mariana Islands became the Mariana Islands District of the Trust Territory. Headquarters for the territory were transferred from Guam to Saipan at that time, and five other districts were established: Palau, Yap, Truk, Ponape and the Marshall islands.

The Micronesians began to move toward self rule in January 1965 when the first elections were held for a bicameral Congress of Micronesia. A commission was established in 1967 to determine the future political status of the islands. In 1970 the commission recommended that the territory should either become a self-governing state in free association with the United States or have complete independence. After 2 years of negotiation, it was agreed that the Micronesians would be guaranteed four basic rights: the right to decide their own constitution, the right to control their own land, the right of self-determination, and the right to unilaterally terminate any compact with the United States. This agreement did not cover the future status of the Mariana Islands, however, which was handled separately.

Northern Mariana Islands

The invasion of the islands by American forces in the summer of 1944 left devastation in its wake. The battle resulted

in high casualties on both sides and the destruction of much of the islands. Saipan and Tinian became forward bases for the offensive, with airstrips and a variety of related government buildings. From 1945 to 1947 the islands continued under U.S. military occupation. Under the interim American military government, Chamorros were relocated from the various Carolinian islands to Tinian, Rota and Saipan.

The northern islands came under trusteeship status in 1947. The islanders participated in the first elections, held for a bicameral Congress of Micronesia, in 1965. Following the report of the Commission on the Future Political Status of the islands, in 1970 negotiations began on a compact between the United States and the Trust Territory. From the outset, the people of the Northern Mariana Islands made known their desire to integrate permanently with the United States. Once it became apparent that the aspirations of the islanders were irreconcilably different from those of the remainder of the Trust Territory, negotiations began in earnest for territorial status.

In 1975 the "Covenant to Establish a Commonwealth of the Northern Marianas in Political Union with the United States" was voted on by the islanders. It was approved in June 1975, and a separate constitution and government were proclaimed in January 1978.

In the years following the war, efforts toward agricultural rehabilitation began. During the Japanese era, sugar cane and other agricultural products were the basis of the area's economy. Unlike the Caroline Islands, the natives on the Northern Mariana Islands had moved away from direct farming. During the Japanese era they acted as the middleman, collecting copra, keeping small stores, supervising labor and other similar tasks. When the Japanese and Okinawans were repatriated, this presented serious problems for agricultural activity on the island.

Despite the difficulties, agricultural productivity has grown. As on the rest of the islands, commercial and local fishing are present. Saipan's port can accommodate a variety of international and interisland craft, including bulk cargo, international fishing fleets, passenger-carrying copra boats and small local fishing boats.

No specific effort was made to research modern shipping losses in the Northern Mariana Islands. It is presumed that they continue to reflect the maritime activities extant in the region. Small local craft, for fishing and pleasure, most likely comprise the majority of losses since the close of World War II.

Guam

As soon as Guam was liberated, efforts began in earnest to transform the island into a military base. All other requirements were subordinated to building and supplying bases for the final assault on Japan and the Philippines. Military and civilians existed in makeshift camps. As many islanders as possible were encouraged to work for the military.

After the war, development of military facilities continued as did improvements of the island in general. Because of the special relationship that Guam had with the United States, an Organic Act was passed by Congress in 1950. This gave Guamanians United States citizenship and some local autonomy.

Guam continued to receive special attention, but it was not until the mid-1960s that the island was permitted a measure of nonmilitary economic growth and international trade. The copra economy had long since given way to nonagricultural employment and small-scale manufacturing. Today the island supports a thriving tourist trade, and it is a major international port for both ships and aircraft in the Pacific.

Ship losses in Guam since World War II mirror the maritime activities extant at the island. Small local craft, for fishing and pleasure, and some larger commercial ships have sunk.

Caroline Islands

American fleet aircraft attacked Truk in early 1944 and destroyed 23 ships and 201 planes. However, Ulithi Atoll was the only island in the Carolines to be occupied by American forces before the Japanese surrendered in 1945.

The Caroline Islands, like the rest of Micronesia, stayed under U.S. military occupation for 2 years after the war, then under trusteeship until 1972. Negotiations for free association continued through the 1970s. In 1978 the remaining districts of the territory drafted a proposal that defined three separate political groupings: Palau, the Federated States of Micronesia, and the Marshall Islands.

The United States began negotiations with each of the groups for a free association relationship in 1978. By 1980 the Federated States of Micronesia (FSM) and Palau had locally enacted constitutions, and constitutional governments were

installed in the Federated States on May 10, 1979, and in Palau on January 1, 1981. At that time the name Belau was officially adopted. Negotiations were finally completed in 1982, and the compact and its related documents were signed by the United States and Belau on August 26, and with the Federated States of Micronesia on October 1. The trusteeship was not terminated in the FSM until 1986.

The only export of consequence continues to be copra, which is exported to Japan. Other lesser exports include bananas, betelnut and trochus shell. Small farm enterprises include black pepper, poultry and egg raising. Management of the FSM's 200-mile marine economic zone has moved toward international licensing agreements. Local fishing continues, but no commercially operated companies exist for fishery export. Local industry includes handicrafts, coconut oil extraction, garment manufacture and soap-making. There are also plans for a cannery.

The major international ports are at Yap, Pohnpei, Kosrae and Truk. These accommodate the variety of international and interisland craft, including bulk cargo, international fishing fleets, passenger-carrying copra boats and small local fishing boats.

No specific effort was made to research modern shipping losses in the Federated States of Micronesia. It is presumed that they continue to reflect the maritime activities extant in the region. Small local craft, for fishing and pleasure, most likely comprise the majority of losses since the close of World War II.

Marshall Islands

When Japan withdrew from the League of Nations in 1935, the Marshall Islands, like many of the other mandates, were fortified and provided with extensive facilities. It was from these islands, principally Kwajalein Atoll, that the Japanese launched attacks against Nauru, Ocean Island and the Gilbert Islands. The Allies were not able to launch counterattacks on the area until after strategic islands in the Gilberts were secured in late 1943. Kwajalein Atoll was the first recaptured, in February 1944. An American military administration was immediately established and preparations began to transform Kwajalein into a staging area for further movement across the Pacific.

The Marshall Islands became part of the United States Trust Territory of the Pacific Islands in July 1947. They remained in this status until the Compact of Free Association was

signed in 1982. Under this agreement, the United States retained responsibility for defense and the use of Kwajalein as a missile-testing range. In return, the Marshallese were slated to receive \$700 million in economic aid over 15 years. The compact did not take full effect until late 1986, when the United Nations trusteeship was finally terminated.

The country produces only one agricultural crop of any significance: copra. The atoll of Arno is the highest producer. Other cash crops include banana, papaya, pandanus and breadfruit, sold in the markets at Majuro and Ebeye. The fishery resources of the islands are largely unexploited, although Japanese fishing fleets are active. Local cooperatives are also actively fishing, but as the catch of the overseas fleets increases, the amount taken by local cooperatives decreases. A number of private companies have begun joint venture projects in fishing. Trochus shell processing and black pearl culture are being developed along with oyster and clam farming. Local industry is limited to the manufacture of handicrafts, fish salting and small boat building. The majority of the population is concentrated on Majuro and Kwajalein.

The major port facility is located on Majuro. A variety of international and interisland craft, including bulk cargo, international fishing fleets, passenger-carrying copra boats, and small local fishing boats vie for space in the lagoon. A growing number of cruising yachts are visiting the port as well.

No specific effort was made to research post-1947 shipping losses in the Marshall Islands. They continue to reflect the general maritime activities in the region. Small local craft, for fishing and pleasure, are probably the majority of losses since the close of World War II. The major exception to this is the sinking of 23 ships during atomic testing in the mid-1940s at Bikini Atoll.

Postwar Postscript: Operation Crossroads

Immediately after the war the inhabitants of Bikini were relocated to Rongrik Atoll. The remaining islanders were helped to resettled in their former homes as best as possible. Many chose to stay in Kwajalein and Majuro, close to the U.S. military bases, for economic reasons.

In 1946, the United States began using Bikini for the first in a series of atomic tests: tests Able and Baker, an air burst and subsurface burst. Both tests were conducted using an array of 70 ships, landing craft and submarines around ground zero to test the effects of heat, blast and

radiation. The ships carried tons of military equipment--trucks, guns, tanks and planes--as well as live animals. Some of the ships sank during the tests and remain in Bikini Lagoon. Others were disposed of at Bikini after radiological testing. Those ships that remain are in relatively deep water.

Table 7.1. Ships Sunk in Bikini as a Result of Atomic Tests or Posttest Activity

<u>Name</u>	<u>Type</u>
ANDERSON (DD-411)	Destroyer
APAGON (SS-308)	Submarine
ARDC-13	Concrete repair dock
ARKANSAS (BB-33)	Battleship
CARLISLE (APA-69)	Merchant
GILLIAM (APA-57)	Merchant
LAMSON (DD-367)	Destroyer
LCI-620	Landing craft, infantry
LCT-414	Landing craft, tank
LCT-812	Landing craft, tank
LCT-1114	Landing craft, tank
LCT-1175	Landing craft, tank
LCT-1187	Landing craft, tank
LCT-1237	Landing craft, tank
LST-125	Landing ship
NAGATO (ex-Japan BB)	Battleship
PILOTFISH (SS-386)	Submarine
SAKAWA (ex-Japan CL)	Cruiser
SARTOGA (CV-3)	Aircraft carrier
WAINWRIGHT (DD-419)	Destroyer
YO-160	Concrete oil barge

Many of the ships that survived both Able and Baker tests and were not sunk later at Bikini were towed to Kwajalein. Tests continued on these ships until 1948 when the vast majority were used for target practice or were scuttled and sunk in deep water. Of the remaining ships, some were taken back to scrap yards on the Pacific coast and sold, while others were used for target practice and sunk.

In 1947 isolated Enewetak was chosen for further tests, and its 146 inhabitants were resettled on Ujelang. The first U.S. hydrogen bomb was exploded at Enewetak on March 1, 1954; two more were detonated in the following weeks. No ships were involved in these tests, which were repeated in 1956, 1958 and 1962.

Table 7.2. Ships Sunk at Kwajalein

<u>Name</u>	<u>Type</u>
BANNER (APA-60)	Merchant
BARROW (APA-61)	Merchant
BRACKEN (APA-64)	Merchant
BRISCOE (APA-65)	Merchant
BRULE (APA-66)	Merchant
BUTTE (APA-68)	Merchant
CARTERET (APA-70)	Merchant
CATRON (APA-71)	Merchant
DAWSON (APA-79)	Merchant
FALLON (APA-81)	Merchant
MYRANT (DD-402)	Destroyer
MUGFORD (DD-389)	Destroyer
MUSTIN (DD-413)	Destroyer
RALPH TALBOT (DD-390)	Destroyer
RHIND (DD-404)	Destroyer
STACK (DD-406)	Destroyer
TRIPPE (DD-403)	Destroyer
WAINWRIGHT (DD-419)	Destroyer
WILSON (DD-408)	Destroyer
PENNSYLVANIA (BB-38)	Battleship
PENSACOLA (CA-24)	Cruiser
KMS PRINZ EUGEN (ex-German)	Cruiser
YOG-83	Gasoline barge
LST-52	Landing craft, tank
LST-133	Landing craft, tank
LST-220	Landing craft, tank
LST-545	Landing craft, tank
LST-661	Landing craft, tank
LCI-327	Landing craft, infantry
LCI-332	Landing craft, infantry
LCI-620	Landing craft, infantry
LCI-412	Landing craft, infantry
LCT-705	Landing craft, tank
LCT-746	Landing craft, tank
LCT-816	Landing craft, tank
LCT-818	Landing craft, tank
LCT-874	Landing craft, tank
LCT-818	Landing craft, tank
LCT-874	Landing craft, tank
LCT-1078	Landing craft, tank
LCT-1112	Landing craft, tank
LCT-1113	Landing craft, tank
LCT-1115	Landing craft, tank

Kwajalein continued to be used as a U.S. naval base after the war, and the period 1951-1956 saw increased activity because of its position on supply routes for U.S. operations in Korea and nuclear testing in Bikini and Enewetak.

Enewetak was formally returned to its original inhabitants in September 1976; at that time, the U.S. began an extensive clean-up and rehabilitation program. In 1980 about 550 people were returned from Ujelang.

In August 1968, after the completion of the atomic testing program on Bikini, the island was announced fit for human habitation. By 1971, two of the islets had been cleared of debris. At that time 140 Bikinians were allowed to return. However, tests in 1977 revealed that despite a \$3 million decontamination project, Bikini groundwater was still too radioactive for human consumption, as were the coconuts, fruit and vegetables grown in Bikini soil. The Bikinians were resettled once again; some were sent to Kili and others were scattered on Majuro, Ebeye in Kwajalein, and Jaluit. Efforts at rehabilitation and decontamination have continued but with mixed results. In 1989, estimates for full decontamination ranged from 20 to 90 years. Enui Island, in the Bikini group, could be resettled in the near future, but all of the risks have still not been determined.

The influence of the United States, particularly on Majuro and Kwajalein, has been tremendous. The effects range from diet to social behavior. In the more remote atolls the impacts are far less pronounced. Despite this, traditional chiefs still command a good deal of respect and their importance has been recognized in the constitution of the republic.

Gilbert Islands

On December 9, 1941, two days after the raid on Pearl Harbor, Japanese aircraft bombed Ocean Island (Banaba), and reconnaissance parties landed briefly on Tarawa and Butaritari. Within a few months, most of the Europeans on those islands were evacuated. Some government officials stayed, joined by missionaries and coast watchers from New Zealand. Twenty-two coast watchers were eventually killed by the Japanese. Tarawa and Makin atolls were transformed into forward bases. Throughout the Japanese occupation the Gilbertese resisted passively, their only course of action.

Temporary headquarters for the remaining islands of the colony, not in Japanese hands, were transferred to Sydney. They remained there until November 1943, when American forces

recaptured the islands. British colonial officials returned to the islands with American Marines and immediately set up a labor corps that handled a good deal of the stevedore responsibilities in preparation for the campaign in the Marshall Islands. New government headquarters were set up on Tarawa, where they have remained.

When Ocean Island was reoccupied in 1945, all of the Gilbertese labor force were dead and the native Ocean Islanders had been deported to Nauru and Kosrae in the Caroline Islands. When Nauru and Kosrae came under Allied control, the Ocean Islanders chose to go to Rabi Island in Fiji rather than return to their former home.

Within a few years of the war, most of the people of the islands were resettled, the displacements and disruptions mended as best as possible. An important postwar move in the main islands was the strengthening of the cooperatives that were originally established in the late 1930s. This made it unprofitable for any foreign trading firm to return to the group.

There was also a move in the late 1950s to give the islanders a greater degree of self-determination. In 1963 an executive council and an advisory council were created, giving the islanders a formalized advisory role. In 1967 the advisory council was replaced by a house of representatives. It did not have legislative powers and acted much in the same manner as did the advisory council.

In 1971, the house of representatives was replaced by a legislative council of 23 elected members, and the government council was replaced by an executive council. On January 1, 1972, the colony moved out from under the jurisdiction of the Western Pacific High Commission and the resident commissioner was sworn in as the first governor. In 1974 the Ellice Islanders voted to secede from the colony, and in April and May 1977 more than 200 members of local government councils, churches, traditional leaders, and cooperative societies met to draft a new constitution. Independence was formalized on July 12, 1979, with the presentation of Letters Patent formally declaring the country's independence from Britain. Upon independence, the name Kiribati was adopted.

In September 1979, a treaty of friendship was signed between the Republic of Kiribati, which now included the Phoenix and Line islands, and the United States. Under the treaty the U.S. relinquished all claims to 14 islands in the Line and Phoenix group that had been made under the Guano Act of 1856.

Copra still continues to be the only exported agricultural product. Other foodstuffs are grown, and fishing is done

principally for local consumption. The creation of a 200-mile economic zone and agreements with several nations for fishing rights are leading toward the development of commercial fishing in the region. Plans to develop a national tuna-fishing industry have begun, and fishing boats, both donated and contracted, are in use. Butaritari is the proposed base for the commercial operation. Efforts are also being made in aquaculture, principally farming of milkfish and lobster.

Local industry is limited to the manufacture of handicrafts, fish salting and small-boat building. The phosphate mining industry on Banaba (the name was changed from Ocean Island at the time of independence) closed down in 1979. In late 1988 the possibility of commencing operations once again was being considered.

The main overseas port facility is at Betio in Tarawa. All large ships are worked by tugs and barges from anchorages offshore. Commercial shipping is handled by several companies. Nauru Pacific Line carries both cargo and passengers. The Philippines, Micronesia & Orient Navigation Company offers a regular container service from Honolulu to Tarawa. In addition, Asia Pacific, KAP New Guinea Line, China Navigation and Star Shipping serve the islands.

No specific effort was made to research modern shipping losses in the Gilbert Islands. It is presumed that they continue to reflect the maritime activities extant in the region. Small local craft, for fishing and pleasure, most likely comprise the majority of losses since the close of World War II.

The Modern Era

The nature of transoceanic shipping has changed dramatically since the close of World War II. Commercial passenger liners, large bulk cargo and container freighters, and tankers are the ships that today ply those waters. They move the general merchandise, bulk cargoes of grain, crude oil, raw and refined minerals, fuel, people and manufactured goods that form the backbone of modern industrial economies on both sides of the Pacific. Modern military ships also roam the region. Unlike their predecessors and many of their contemporaries, some of these ships are nuclear-powered.

The advent of satellite-linked communications and positioning has reduced not only the potential for grounding but has provided a safety net to expedite rescue operations. Although losses still do occur, they are most numerous among

the small boats, local fishing or work boats, and pleasure craft of all sizes.

Record keeping, part of the duty of the various Ports Authority, tracks the coming and going of hundreds of ships a month. Far from being relegated to second class status as a result of the preeminence of aircraft transport, shipping is greater than ever. While aircraft do handle the bulk of passenger traffic, shipping in the region is concentrating on the manufactured goods and raw materials needed to support an interlinked world economy.

CHAPTER VIII.
SHIPWRECKS: THE HISTORICAL RECORD

By Toni L. Carrell

Introduction

Documented ship losses in Micronesia span more than four centuries, from the first European ships accompanying Magellan in 1520 to modern yachts and pleasure boats lost each year. Of course, the undocumented losses go back to the earliest peopling of the region. Unfortunately, to date, no prehistoric watercraft have been discovered. However, every major historic trend and activity in the region is mirrored in the record of ship losses. Early exploratory ships and traders, galleons, privateers, colonial presidio boats, whalers, missionary ships, military cruisers, mail ships and passenger ships as well as every type of modern military ship used in two world wars and those used in atomic testing have been lost in the islands of Micronesia.

The vast majority of shipping losses occurred during World War II, although, proportionate to their historical numbers, whalers did not fare well either.

A wide variety of sources, from archival documents housed in Spain, Mexico and the Philippines to modern military histories was examined during the research for this chapter. As a result of the combined efforts of the many contributors to this report, the list of ships known to have been lost in the region numbers 581. By no means is this list exhaustive. We were not able to search Japanese archives nor could every ship listed in the report of Japanese Naval and Merchant Shipping Losses During World War II by All Causes (Joint Army-Navy Assessment Committee, 1947) be traced.

However, the bulk of the known ship losses now forms the core of a shipwreck data base at the Submerged Cultural Resources Unit offices in Santa Fe. Obviously, the exact location of each of the 581 ships is not known, nor have but a handful been located and investigated, even on a preliminary basis. The data base forms a starting point from which to work and also makes handling the many pieces of information about the ships more manageable.

The purpose of this chapter is to provide a frame of reference, that is, the historical documentary structure within which these sites can be evaluated. It is geared to allow the resource manager a quick understanding of the range of resources and the numbers of sites of a specific type or from a specific time period that may be present. This basic information is an important part of the process by which sites are evaluated for their significance. It is also useful in planning for resource research and surveys. In other words, those responsible for the protection, management and interpretation of submerged resources need to know what their resource base is.

The chapter is organized by era and island chain. Because of the vast numbers of ships lost during World War II, a list of those sites, broken down by type, is provided. In a few cases, some additional background on the ship types is also presented.

Ship Losses, 1520-1941

Mariana Islands

Saipan

Forty-one documented ship losses have occurred in and around Saipan; of these only four predate World War II. The earliest known is the Manila galleon, NUESTRA SENORA de la CONCEPCION, wrecked in 1638. Two other ships, as yet unidentified through historical research, were also lost in the vicinity of Saipan later in that century. Finally, the whaling ship, LIZZIE JARVIS, was lost in 1865.

Tinian

Seventeen shipwrecks are known to have occurred on Tinian. The earliest is that of the U.S. brig, BRAMIN, wrecked in 1797. Other early shipwrecks from the period of colonialism and commercial expansion are the packet ESPERMAN (1799), the Spanish bark MARIA DEL ROSARIO (1872), and an unidentified bark (1876). The remainder are World War II merchant and naval ships.

Rota

The 12 known shipwreck sites on Rota span nearly four centuries. Five of those predate World War II. The earliest documented wreck is that of SANTA MARGARITA, a manila galleon lost in 1601, somewhere just offshore of the island. Four other ships are reported to have been lost in the vicinity of

Rota during the Spanish colonial period. They are the presidio ships NUESTRA SEÑORA de LUMEN (1746) and SAN FELIPE (1776) and the ocean-going canoes SAN FERNANDO and SAN FRANCISCO (1786).

Guam

There have been 63 documented shipwrecks in and around Guam over the last four centuries. Twelve were from the Spanish colonial period. The earliest was the manila galleon, SAN PABLO, sunk at anchor when a typhoon struck in 1568. SAN PABLO, a small galleon of 300 tons, was the first of its type to be lost in the Acapulco-Manila trade. Because of its small size, SAN PABLO was not typical of the ships used later in the trade. Three other galleons are known to have been wrecked at Guam: NUESTRA SEÑORA del PILAR ZARAGOSA, NUESTRA SEÑORA del BUEN VIAJE (1754) and NUESTRA SEÑORA de la CONCEPCION (1775). A typical reconstruction of a Manila galleon, based upon archival information and limited site excavations, shows the compactness of these slow, but capacious, ships (Figure 8.1).

The commercial trading and whaling period is represented by 23 ships, all sunk between 1802 and 1886. One each from the American Naval period on Guam and from World War I are also represented.

A well-known shipwreck was the Cunard liner, SCOTIA. It was converted from a side paddle wheeler to a twin screw cable ship in 1877 after an extremely successful 16-year career as a passenger ship (Figure 8.2). The ship wrecked in 1904 off the tip of the Glass Breakwater in an area referred to as the Spanish Rocks.

The following overall compilation of ship losses in the Mariana Islands was researched by Mrs. Marjorie G. Driver and Fr. Thomas B. McGrath.

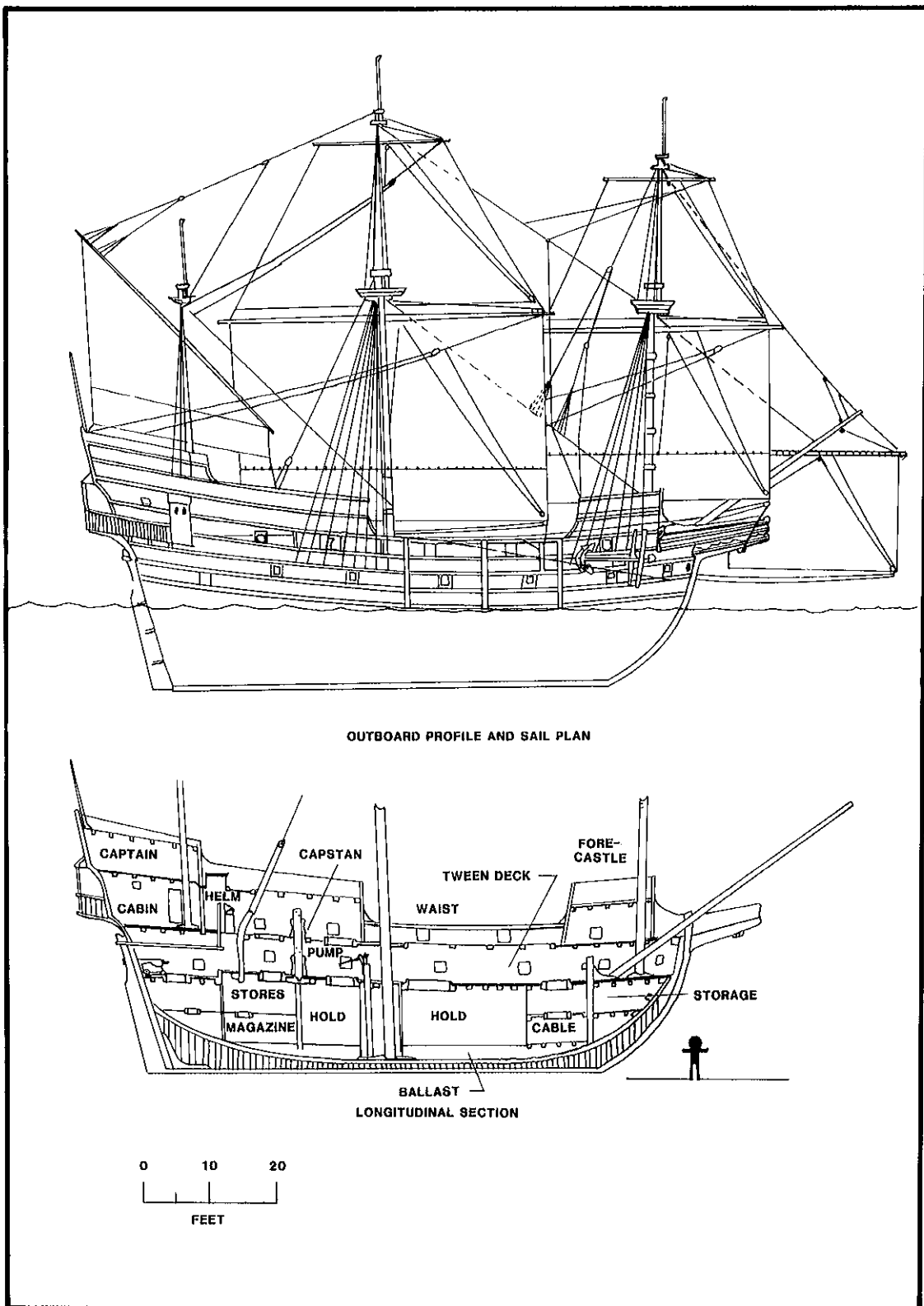


Fig. 8.1. Profile of a typical Manila galleon, ca. 1600. (Adapted by NPS from drawing by Ray Aker of assumed appearance of galleon SAN AGUSTIN, 1595)

Table 8.1. Spanish and American Naval Era Ship Losses, 1521-1941, Mariana Islands

<u>Name</u>	<u>Yr Lost</u>	<u>Type</u>	<u>Location</u>
SANTA MARGARITA	1552	Caravel	Ladrones
SAN PABLO	1568	Galleon	Guam
SANTA MARGARITA	1600	Galleon	Rota, Atetito
NUESTRA SENORA de la CONCEPCION	1638	Galleon	Saipan
Name unknown	1648	Sampan	Saipan
SAN FRANCISCO XAVIER	1683	Patache/sloop	Guam, Umatic
NUESTRA SENORA del PILAR de ZARAGOZA	1690	Galleon	Guam, Cocos
Name unknown	1696	Schooner	Saipan
Name unknown	1696	Unknown	Guam, Santa Rosa Banks
Name unknown	1709	Patache	Guam vicinity
Name unknown	1710	Balandra/sloop	Umatic-Belau
SANTO THORIBIO	1722	Patache	Guam vicinity
SAN JOSEPH	1732	Patache	Guam, Merizo
SAN FRANCISCO XAVIER	1732	Sloop	Guam
SAN FERNANDO	1732	Banca (canoe)	Rota
Name unknown	1740-46	Presidio ship	Guam-Tinian
NUESTRA SENORA de LUMEN	1746-49	Presidio ship	Rota
SANTO DOMINGO de GUZMAN	1746	Presidio ship	Rota
NUESTRA SENORA del BUEN VIAJE	1754?	Galleon	Guam, Pago?
Name unknown	1759-68	Banca	Guam-Tinian
SAN PEDRO (?)	1766	Type unknown	Ladrones
NUESTRA SENORA de la CONCEPCION, alias DESENGANO	1775	Frigate	Guam
SAN FELIPE	1776-86	Presidio ship	Rota
SAN LORENZO	1786-94	Banca (canoe)	Ladrones
SAN FERNANDO	1786-94	Banca (canoe)	Rota
SAN ANTONIO	1786-94	Banca (canoe)	Guam-Tinian
SAN FRANCISCO	1786-94	Banca (canoe)	Rota
SAN JOSE	1789	Banca (canoe)	Rota-Guam
SAN VICENTE	1789	Banca (canoe)	Guam-Tinian
ESPERMEN	1798	Packet boat	Tinian
NUESTRA SENORA del ROSARIO, alias LA PALOMA	1802-06	Frigate	Guam
Name unknown	1806-12	Banca (canoe)	Rota-Guam
Name unknown	1812-22	Presidio boat	Guam

Name	Yr Lost	Type	Location
SANTIAGO, alias INFANTE DON CARLOS, LA CONSTITUCION	1814	Frigate	Guam
RESOURCE	1819	Type unknown	Ladrones
CLARINGTON	1825	Frigate	Guam, Umatic
PRONTO	1829-37	Bergantin	Guam, Apra Hbr
CANDIDA	1829-37	Bergantin	Tongatabu (?)
FALCON	1829-37	Whaler	Ladrones
ISABELLA	1842?	Frigate	Marianas (?)
COURRIER des INDES	1847	Type unknown	N. Mariana Is.
CANTON	1848	Frigate	Tinian
E.L.B. JENNY	1851	Whaler	Guam
AUSTERLITZ	1851	Type unknown	N. Mariana Is.
WILLIAM T. SAYWARD	1854	Bark	Mariana Is.
LIZZIE JARVIS	1855	Whaler	Saipan
INVENCIBLE	1856	Bark	Guam
WILLIAM BADGER	1856	Type unknown	Anatahan
ASIA	1856	Whaler	Guam
Name unknown	1856	Banca (canoe)	Guam- N. Mariana Is.
LA CHAMORRITA	1857	Brig	Guam
PFEIL	1859	Schooner	Guam
Name unknown	1860	Brigantine?	Guam
SAN FRANCISCO de BORJA	1862	Banca (canoe)	Guam-Rota
Name unknown	1867	Local boat	Guam
Name unknown	1867	Lancha (launch)	Guam
Name unknown	1868	Pilot boat	Guam
Name unknown	1868	Brig	Guam vicinity
Name unknown	1870	Lancha	Guam
MARIA DEL ROSARIO	1872	Bark	Tinian
CASHMERE	1873	Frigate	Anchor, Umatic
SAN JOSE	1874	Schooner	Mariana Is.
Name unknown	1876	Bark	Saipan
SECRETO	1886	Schooner	Guam
F.H. DREWS	1888	Type unknown	Mariana Is.
YAP	1891	Schooner	Guam
YOSEMITE	1900	Steam launch	Guam
CS SCOTIA	1904	Cable ship	Guam
SMS CORMORAN	1917	Pass/Cruiser	Guam
DAI-ICHI MARU	1940	Steamer	Guam
TOGO MARU	1940	Steamer	Tinian

Caroline Islands

Except for World War II shipping losses, whaling ships are the most numerous shipwrecks in the Caroline Islands. Whalers wrecked from the Belau Islands in the west to Kosrae in the east.

Republic of Belau

Seventy-nine ships are known to have wrecked in the islands of Belau. Of those, only 10 predate World War II. One of the most famous of the early wrecks in Belau was that of the British East India Company (EIC) ship, ANTELOPE. Captained by Henry Wilson, ANTELOPE ran aground on a reef near Ulong Island in 1783. Wilson and his crew began what would prove to be a long period of British influence in the internal affairs of these islands. Some 27 years later, the British MARTHA (1810) wrecked on Helen's Reef in the south; LADY RAGLAN (1858) is also there. The whaler, MENTOR, ran aground in the northern islands in 1832, while the British trader, RENOWN, wrecked in 1870. The trader, LILLA, is reported to have wrecked at Melekeok in 1880. Three unidentified ships, a patache (1709), a sloop (1710), and a ship of unknown type (1853-1854), are reported to have been lost in the vicinity of Belau.

Federated States of Micronesia

State of Yap

Of the 14 ships known to have been sunk within the state, 6 predate World War II. The earliest was that of the American schooner, DASH, wrecked on Ngulu in 1832 while on a trading voyage. The ship, EBBA BRAHE, likely involved in trading or whaling, also wrecked on Ngulu in 1866. The trader, BELVEDERE, and the mail ship, AGUSTIN, both wrecked at Yap in 1871 and 1882, respectively. The schooner, CAROLINE, wrecked near Faraulep in 1882.

State of Truk

All of the 75 documented losses in Truk are Japanese World War II merchant and naval ships.

State of Pohnpei

According to historic documentation, 23 ships were sunk in Pohnpei; of those, 17 predate World War II. All were lost during the whaling and trading era (1836-1884).

Table 8.2. Whaling and Trading Era Ship Losses, 1836-1884, State of Pohnpei

<u>Name</u>	<u>Yr Lost</u>	<u>Type</u>	<u>Location</u>
ISABELLA	1811	Trader	Oroluk
FALCON	1836	Whaler	Mwokil
SHAW	1843	Trader	Oroluk
HOWARD	1844	Whaler	Pohnpei
SARAH MOORES	1853	Trader	Ngetik
MAINTONOMI	1854	Whaler	Pohnpei
CONSTANCE	1858	Trader	Oroluk
Unidentified	1860	Trader	Pohnpei
NORNA	1861	Trader/coal	Oroluk
PEARL	1865	Whaler	Pohnpei
HECTOR	1865	Whaler	Pohnpei
HARVEST	1865	Whaler	Pohnpei
EDWARD CAREY	1865	Whaler	Pohnpei
MALOLO	1870	Trader	Pohnpei
KAMEHAMEHA	1873	Trader/guano	Pohnpei
Unidentified	1873	Whaler	Pohnpei
BOTHWELL CASTLE	1884	Trader	Ngetik

The most famous of these wrecks are those of the whalers, PEARL, HECTOR, HARVEST and EDWARD CAREY (Figure 8.3) burned in Lea Harbor by the Confederate raider, SHENANDOAH.

State of Kosrae

Eleven of the twelve shipwrecks at Kosrae were whalers and traders. WAVERLY and HONDURAS, a whaler and a trading ship respectively, both wrecked in 1835. These are the earliest ship losses known on the island. The whaler, HARRIET, wrecked in 1842, followed by the trader, GENII, and another, unidentified whaler in 1852. PARAGON and LEXINGTON (Figure 8.4), both whalers, wrecked in 1853 and 1859. The missionary packet and trader, MORNING STAR II, wrecked in 1868. The brig, LEONORA, used in Bully Hayes' blackbirding and trading activities, sunk in Port Lottin, Utwa anchorage, in 1874. The trader, STAGHOUND, sank in 1883, followed by MORNING STAR III in 1884.

Republic of Marshall Islands

The Marshall Islands never saw the numbers of whalers that were so prevalent in the Caroline Islands to the west. Traders, principally interested in obtaining copra, shell and bêche-de-mer, predominated in the years before World War II. In all, 18 ships are known to have wrecked in the islands, all during the colonial era; not one was a whaler.

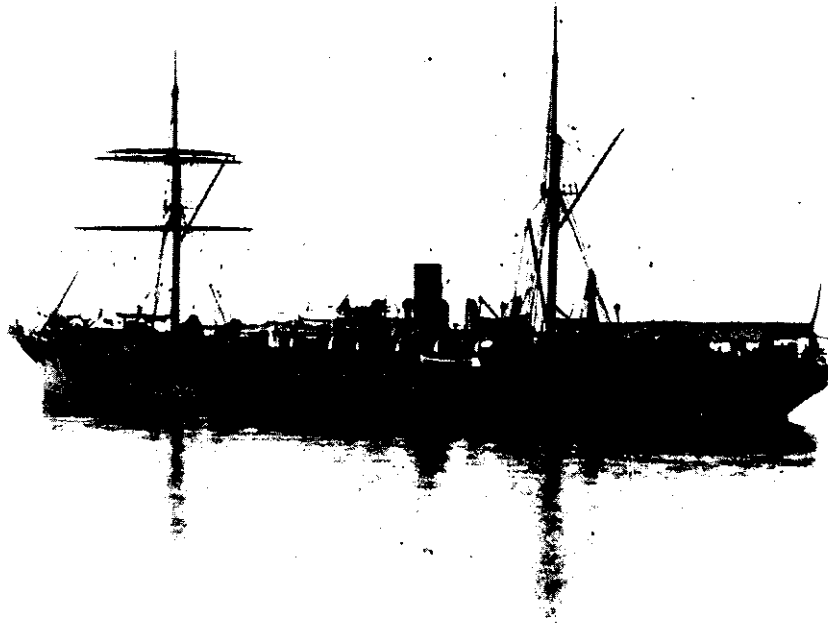


Fig. 8.2. CS SCOTIA wrecked outside Apra Harbor in 1904.
(Photo courtesy of Jim Brandt)

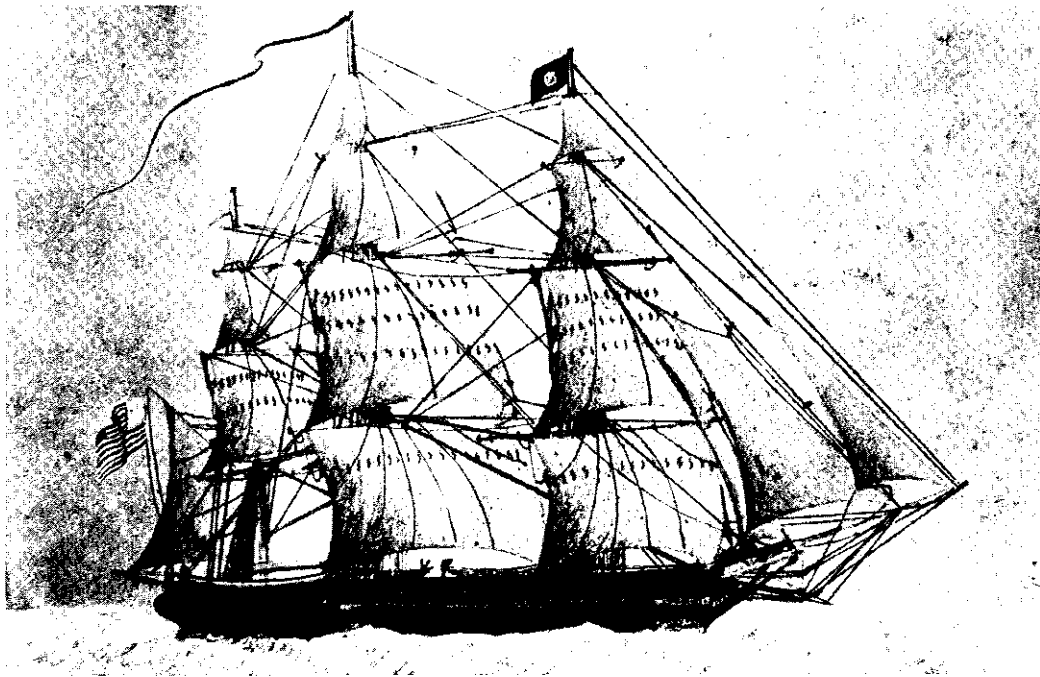


Fig. 8.3. EDWARD CAREY of Nantucket was one of four whalers
sunk in Lea Harbor by the Confederate raider, SHENANDOAH.
(Photo courtesy Peabody Museum of Salem)

Table 8.3. Colonial Era Ship Losses, 1832-1884, Marshall Islands

Name	Yr Lost	Type	Location
CANTON	1832	Bark	Bokaak
WILLIAM NEILSON	1846	Brig	Ebon
Unidentified	1851	Schooner	Namorik
GLENCOE	1852	Schooner	Ebon
SEA NYMPH	1852	?	Jaluit
Unidentified	ca 1861	?	Bikini
CLARA D. ROBBINS	1863	Schooner	Majuro
FRANZ	1863	Schooner	Rongrik
MARIA	1863	Schooner	Ebon
SYRINGA	1868	Bark	Jaluit
Unidentified	1868	Schooner	Namorik
MANA	1874	Schooner	Jaluit
ALFRED	1874	Brig	Jaluit
JULIE REITZ	1875	Bark	Jaluit
Unidentified	1875	Schooner	Jaluit
Unidentified	1875	Schooner	Jaluit
CORYPHEUS	1884	Bark	Ailuk
RAINIER	1884	Schooner	Ujae

The earliest of the wrecks was that of the EIC trader, CANTON. Typically the Indiamen were 140 feet long and 35 feet in beam, twice the size of an ordinary eighteenth-century merchantman (Figure 8.5). Although beautifully appointed with a carved taffrail and oriel windows in the stern and quarter galleries, the ungainly hull was too long for its breadth. In order to stow the maximum cargo for the lowest possible tax fees, the British EIC built its ships long, narrow and deep. As a result, an 800-ton Indiaman could carry nearly 1,000 tons of tea.

Because of its shape, however, it was a poor sailer. With a bluff bow and rounded bottom, it could only make 3 or 4 knots, half the speed of its contemporary warships. When sailing close to the wind, its high superstructure acted like a sail, forcing the ship sideways rather than forward. Even in calm waters, the ship would tend to lurch and roll, often making the crew seasick. Despite their drawbacks, EIC ships roamed all the world's oceans and extended British influence wherever they docked. MARTHA, wrecked at Helen's reef in 1810 in Belau, may be another example of this type of ship.

Gilbert Islands, Republic of Kiribati

The 18 ships wrecked among the Gilbert Islands that predate World War II represent the trading, whaling,

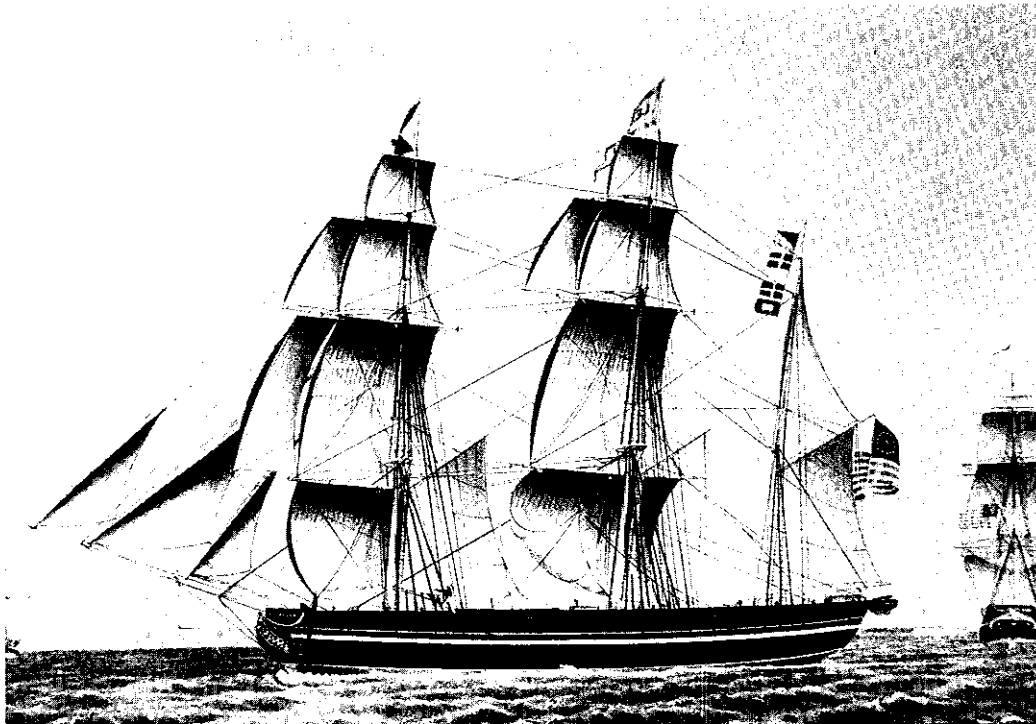


Fig. 8.4. The whaler LEXINGTON wrecked in Kosrae in 1859.
(Photo courtesy Peabody Museum of Salem)

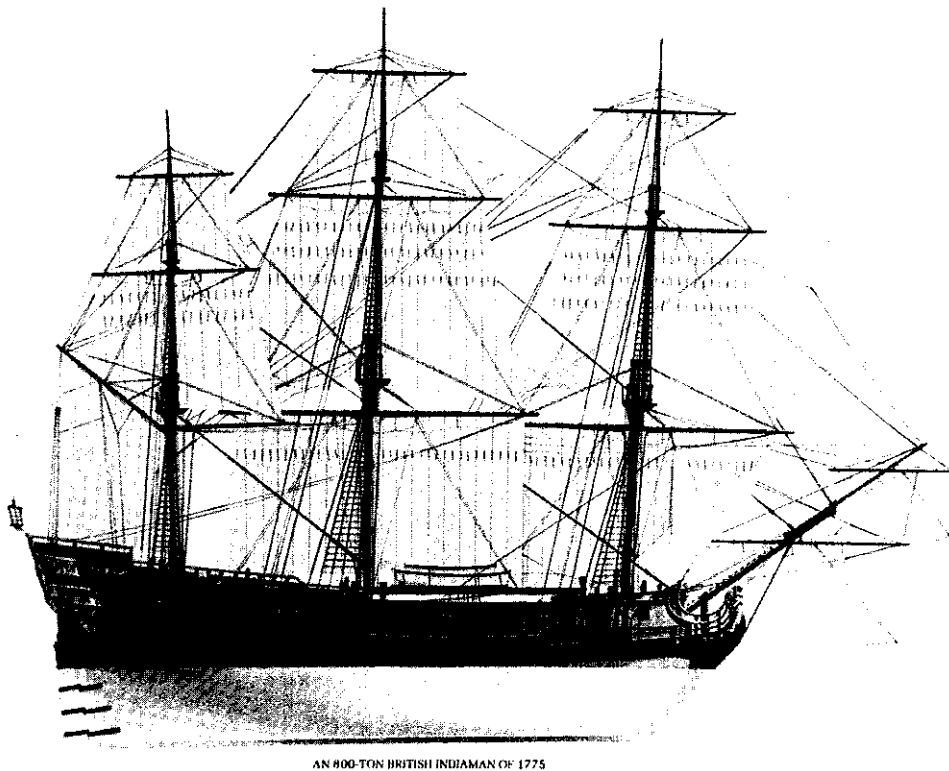


Fig. 8.5. A typical British East Indiaman of 1775.

labor-recruiting, and phosphate-mining activities that dominated the islands for a century.

Table 8.4. Colonial Era to Post-World War I Ship Losses, 1834-1928, Gilbert Islands

<u>Name</u>	<u>Yr Lost</u>	<u>Type</u>	<u>Location</u>
CORSAIR	1834	Whaler	Tabiteuea
COLUMBIA	1844	Whaler	Nonouti
FLYING FOX	1848	Trader	Nonouti
RODOLPH	1851	Trader	Tabiteuea
ONTARIO	1852	Whaler	Butaritari
INGA	1852	Whaler	Nauru
ORWELL	1881	Whaler	Beru
JULIA	1884	Laborer	Nikunau
GEORGE NOBLE	1888	Trader	Nonouti
ELBA	1904	Bulk cargo	Banaba
HIRAM BINGHAM	1909	Trader	Butaritari
OCEAN TRANSPORT	1928	Bulk cargo	Banaba

Nearly 30 whaling ships wrecked in the islands of Micronesia. They were lost as result of human error, conflict with the native peoples or natural causes. Whatever the reason, they are among the most numerous of a specific type predating World War II.

Whalers shared certain traits, among them a tubby, capacious hull that was framed and planked throughout with strong, durable oak (Figure 8.6). Speed was not important; the best ships were those that could plod along for months or years while accumulating barrels of whale oil in their holds. Typically, these ships made little more than 5 knots. The bark rig, preferred on whalers, and fore-and-aft sails on the mizzenmast meant that fewer men were required to handle the sails.

The plan of CHARLES W. MORGAN (Figure 8.7), a classic example built at the peak of the whaling period, shows the deck arrangement. Slim whaleboats hung from davits off the rails, three on the port and two on the starboard. A sixth boat was stowed on the deck. Steering was aft and the tryworks forward, between the fore and main masts. The two large iron caldrons in the tryworks were surrounded by brick. Three small hatches broke up the deck and were located forward of the tryworks and forward and aft of the main mast. The 'tween decks hold was unbroken with the exception of a bulkhead at the forecastle and another aft, leading to the crew and cook quarters.

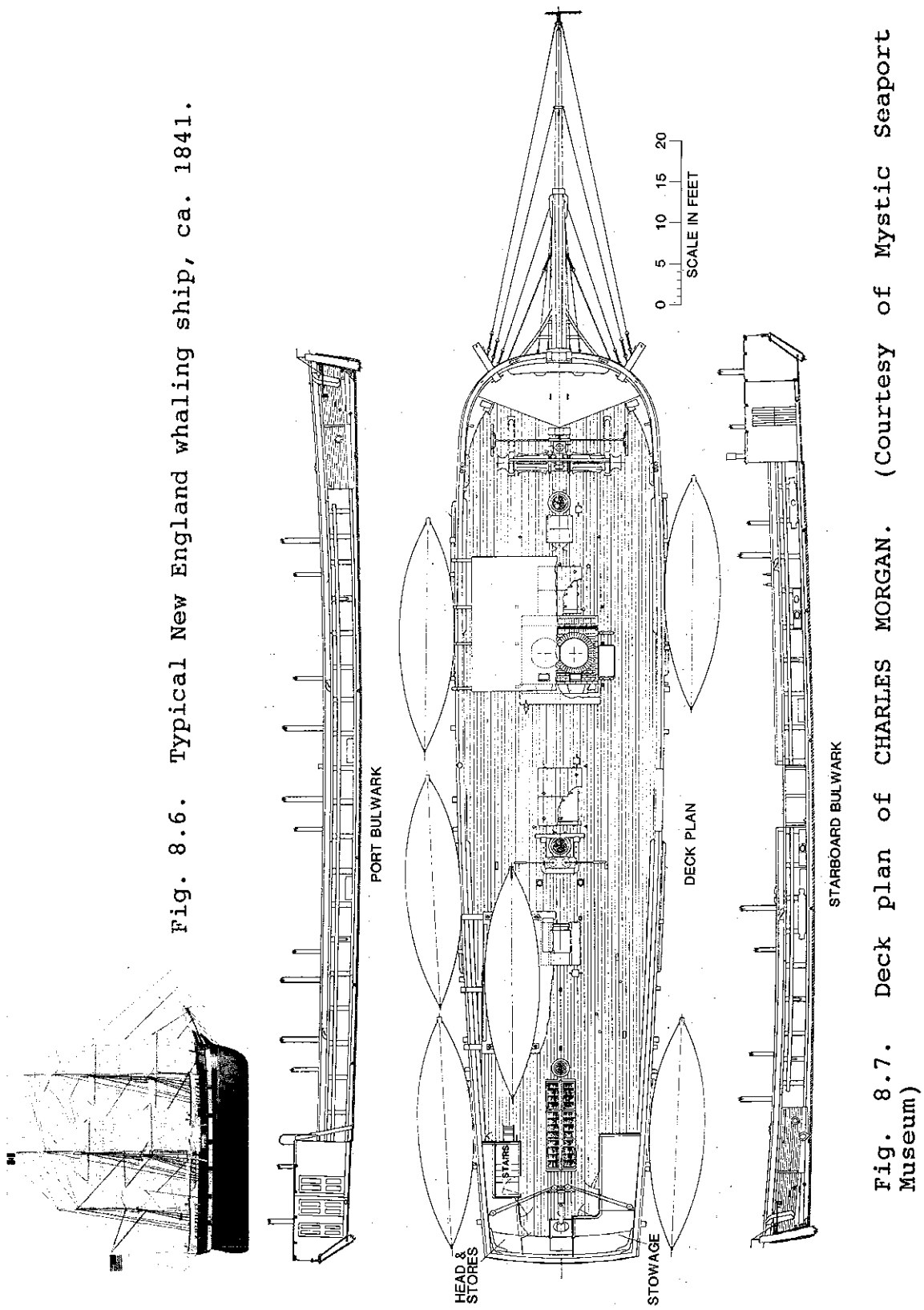


Fig. 8.6. Typical New England whaling ship, ca. 1841.

Fig. 8.7. Deck plan of CHARLES MORGAN. (Courtesy of Mystic Seaport Museum)

Whaling activity dramatically impacted the islands of Micronesia, and the whalers themselves, as well as their descendants, heralded an era of dramatic change.

Ship Losses, 1941-1946

More than 300 ships were sunk in Micronesia during World War II. They are summarized in Tables 8.5 and 8.6, compiled by Don Boyer.

Table 8.5. Representative List of Imperial Japanese Warships and Major Fleet¹ Auxiliaries Sunk within Central Pacific Islands

<u>Name</u>	<u>Type</u>	<u>Date/Location</u> ²	<u>Agency</u>
SHOKAKU	Aircraft carrier (Shokaku class)	Sunk 6/19/44 140 nm N of Yap Island (11° 40' N, 137° 40' E)	U.S. submarine CAVELLA
HIYO	Aircraft carrier (Junyo class)	Sunk 6/20/44 450 nm NW of Yap Island (15° 30' N, 133° 50' E)	Aircraft from CVL BELLEAU WOOD

¹Sources: Warships of the Imperial Japanese Navy, 1869-1945 and Joint Army-Navy Assessment Committee (JANAC) Report (2/47). The recently published U.S. Submarine Attacks During World War II has not been cross-referenced with this list.

²Latitudes and longitudes can only be considered as approximate except for some ships definitely located at Truk, Palau and Guam. All latitudes and longitudes for sinkings by submarines listed in JANAC use the submarines' position rather than the target vessel. Many ships lost in shallow waters have been partially or fully salvaged in the postwar years. No attempt was made here to identify these vessels as they are no longer in the area.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
TAIHO	Aircraft carrier (Taiho Class)	Torpedoed 6/19/44 180 nm NNW of Yap; blew up and sunk seven hours later (12° 05' N, 138° 12' E)	U.S. submarine ALBACORE
NAKA	Light cruiser (Sendai class)	Sunk 2/17/44 35 nm W of Truk (07° 15' N, 151° 15' E)	Aircraft from CV BUNKER and CVL COWPENS
YUBARI	Light cruiser (Yubari class)	Torpedoed 4/27/44 Near Palau (05° 20' N, 132° 16' E)	U.S. submarine BLUEGILL
KATORI	Light cruiser (Katori class)	Damaged 2/17/44 at Truk by TF 58 aircraft; sunk same day 40 nm NW of Truk (07° 45' N, 151° 20' E)	Aircraft and U.S. CAS MINNEAPOLIS NEW ORLEANS and DDs RADFORD and BURNS
AGANO	Light cruiser (Agano class)	Sunk 2/17/44 160 nm N of Truk (10° 11' N, 151° 42' E)	U.S. submarine SKATE
SUSUKI	Old ³ destroyer (Momi class) (renamed PATROL BOAT #34 in 1939)	Sunk 7/3/44 at Truk (under repair from collision)	Air attack
KIKU	Old destroyer (Momi Class) (renamed PATROL BOAT #31 in 1939)	Sunk 3/30/44 off Palau (07° 30' N, 134° 30' E)	TF-58 aircraft

³Ship terminology is discussed in the text.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
WAKATAKE	Old destroyer (Wakatake ex- Yuri class)	Sunk 3/30/44 60 nm N of Palau (07° 50' N, 134° 20' E)	TF-58 aircraft
TACHIKAZE	Old destroyer (Minekaze class)	Sunk 2/17/44 at Truk (07° 04' N, 151° 55' E)	TF-38 aircraft
OITE	Old destroyer (Kamikaze class)	Sunk 2/17/44 at Truk (07° 40' N, 151° 45' E)	TF-38 aircraft
FUMIZUKI	Old destroyer (Mutsuki class)	Sunk 2/18/44 at Truk (07° 24' N, 151° 44' E)	Aircraft from CV ENTERPRISE
IKAZUCHI	Destroyer (Akatsuki class)	Sunk 4/14/44 200 nm SSE of Guam	U.S. submarine HARDER ⁴
SAMIDARE	Destroyer (Shiratsuyu class)	Wrecked 8/18/44 off Palau (ground- ing); later torpedoed and sunk (8/25/44)	U.S. submarine BATFISH
UMIKAZE	Destroyer (Shiratsuyu class)	Torpedoed 2/1/44 S of Truk (07° 10' N, 151° 43' E)	U.S. submarine GUARDFISH
SUZUKAKE	Destroyer (Shiratsuyu class)	Torpedoed 1/26/44 140 nm NNW of Ponape (08° 51' N, 157° 10' E)	U.S. submarine SKIPJACK

⁴The submarine sinkings data in the JANAC Report were never very wellreceived in the U.S. Submarine Service because of some glaring errors and a tendency to discredit (although not intentionally) eyewitness accounts. The U.S. submarine attacks book referenced in Note 1 above sheds considerable light on the subject.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
MAIKAZE	Destroyer (Kagero class)	Sunk by gunfire 2/17/44 40 nm NW of Truk (07° 45' N, 151° 20' E)	U.S. task group 50.3-2 BB, 2 CA, 4 DD
GYORAITAI NO. 2 and NO. 3	Motor torpedo boat (Gyoraitei)	Sunk 9/19/43 off Tarawa (both)	Aircraft from CV LEXINGTON, CVLs PRINCETON and BELLEAU WOOD
GYORAITAI NO. 10	Motor torpedo boat	Sunk 2/17/44 at Truk (07° 51' N, 151° 59' E)	TF-38 aircraft
RO-60	Vickers L(4) type submarine (ex No. 59)	Wrecked 12/19/41 on north point of Kwajalein (09° N, 167° 30' E)	Operational accident
RO-38	Kaichu (6) type submarine	Missing after 11/19/43 en route to Kiribati Islands	Unknown
RO-40	Kaichu (6) type submarine	Sunk 2/16/44 45 nm NW of Kwajalein (09° 50' N, 166° 35' E)	US DD PHELPS, minesweeper SAGE
RO-42	Kaichu (6) type submarine	Sunk 6/10 or 6/11/43 90 nm ENE of Roi, Kwajalein Atoll (10° 05' N, 168° 22' E)	US DE BANGUST
RO-44	Kaichu (6) type submarine	Sunk 6/16/44 110 nm E of Enewetok (11° 13' N, 164° 15' E)	US DE BURDEN R. HASTINGS
RO-45	Kaichu (6) type submarine	Japanese records indicate missing from 4/30/44; US records indicate possibly sunk same day 65 nm SSW of Truk (06° 13' N, 151° 19' E)	US DDs MCDONOUGH, STEPHEN POTTER aircraft from CVL MONTEREY

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
RO-47	Kaichu (6) type submarine	Missing from 9/24/44; possibly (sunk 9/26/44 80 nm W of Yap (09° 19' N, 136° 44' E)	US DE MCCOY REYNOLDS
RO-48	Kaichu (6) type submarine	Missing from 7/14/44; possibly sunk 7/14/44 75 nm W of Saipan (15° 18' N, 144° 26' E)	US DE WILLIAM C. MILLER
RO-114	Kaisho type submarine	Sunk 6/17/44 80 nm W of Tinian (15° 02' N, 144° 10' E)	US DDs MELVIN, WADLEIGH
RO-117	Kaisho type submarine	Sunk 6/17/44 350 nm SE of Saipan (11° 05' N, 150° 31' E)	U.S. Marine Corps aircraft
I-165 (ex I-65)	Kaidai type 5 submarine	Missing from 6/45 possibly sunk 6/27/45 450 nm E of Saipan (15° 28' N, 153° 39' E)	U.S. Marine Corps aircraft
I-169 (ex I-69)	Kaidai type 6A submarine	Sunk 4/4/44 at Truk	Accidental flooding while avoid- ing attack.
I-174 (ex I-74)	Kaidai type 6B submarine	Missing from 4/11/44; probably sunk 4/12/44 N of Truk	U.S. Marine Corps aircraft
I-175 (ex I-75)	Kaidai type 6B submarine	Missing from 1/30/44; probably sunk 2/4/44 100 nm NW of Jaluit (06° 48' N, 168° 08' E)	US DD CHARRETTE, DE FAIR

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
I-177 (ex I-77)	Kaidai type 7 submarine	Missing from 9/24/44; probably sunk 10/3/44 60 nm NNE of Ngeaur (Palau) (70° 40' N, 133° 28' E)	US DE SAMUEL B. MILES
I-184 (ex I-84)	Kaidai type 7 submarine	Missing from 6/15/44; probably sunk 6/19/44 20 nm S of Guam (13° 01' N, 144° 53' E)	US CVE SUWANEE aircraft
I-185 (ex I-85)	Kaidai type 7 submarine	Missing from 6/15/44; probably sunk 6/22/44 90 nm ENE of Saipan.	US DD NEWCOMB, minesweeper CHANDLER
I-5	Junsen type 1M submarine	Missing from 7/19/44; probably sunk same day 360 nm E of Guam (13° 01' N, 151° 58' E)	US DE WYMAN
I-6	Junsen type 2 submarine	Missing from 6/30/44 in Saipan area	Unknown
I-10	A(1) type ⁵ submarine ⁵	Missing from 6/28/44; probably sunk 7/4/44 65 nm ENE of Saipan (15° 26' N, 147° 48' E)	US DD DAVID W. TAYLOR and DE RIDDLE

⁵It is quite possible that type "A" midget submarines may be found among the Central Pacific wrecks. Many were lost in action in most battle areas throughout the war (beginning with five at Pearl Harbor). Since these short-range boats required a "mother ship," either a submarine or surface vessel, and since they were small enough to transport, they may be found in the Central Pacific as well, most likely in harbor or as cargo on various vessels or with submarines stationed at Kwajalein, Saipan and Truk.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
I-12	A(2) type submarine	Missing from 1/5/45 in Central Pacific	Unknown
I-19	B(1) type submarine	Sunk 11/25/43 50 nm W of Makin (03° 10' N, 171° 55' E)	US DD RADFORD
I-21	B(1) type submarine	Missing from 11/27/43 off Tarawa	Unknown
I-28	B(1) type submarine	Sunk 5/17/42 45 nm SSE of Truk (06° 30' N, 152° E)	U.S. submarine TAUTOG
I-32	B(1) type submarine	Sunk 3/24/44 50 nm S of Wotje (08° 30' N, 170° 10' E)	US DE MANLOVE and PC-1135
I-35	B(1) type submarine	Sunk by ramming and gunfire 11/22/43 off Tarawa (01° 22' N, 172° 47' E)	US DE FRAZIER
I-37	B(1) type submarine	Missing from 11/20/44; probably sunk 11/19/44 in NW Kossol Passage, Palau (08° 07' N, 134° 16' E)	US DES CONKLIN, and MCCOY REYNOLDS
I-38	B(1) type submarine	Missing from 11/5/44; probably sunk 11/12/44 85 nm S of Yap (08° 04' N, 138° 92' E)	US DD NICHOLAS
I-39	B(1) type submarine	Sunk 11/26/43 in the Gilbert Islands	DD BOYD
I-42	B(2) type submarine	Sunk 3/23/44 6 nm SW of Ngeaur, Palau (06° 40' N, 149° 10' E)	U.S. submarine TUNNY

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
I-43	B(2) type submarine	Sunk 2/15/44 280 nm ESE of Guam (12° 42' N, 149° 10' E)	U.S. submarine ASPRO
I-48	C(2) type submarine	Missing from 1/20/45; probably sunk 1/23/45 25 nm NE of Yap (09° 45' N, 138° 20' E)	US DES CONKLIN, CORBEISIER and RABY
I-55	C(3) type submarine	Missing from 7/14/44; probably sunk 7/28/44 400 nm E of Tinian (14° 26' N, 152° 16' E)	US DES REYNOLDS and WYMAN
I-362	D(1) type submarine	Missing from 1/1/45; probably sunk 1/13/45 320 nm NNE of Truk (12° 08' N, 154° 27' E)	US DE FLEMING
MUTSURE	Escort/patrol vessel (Etorofu type)	Sunk 9/2/43 85 nm NNW of Truk (08° 40' N, 151° 31' E)	U.S. submarine SNAPPER
SOKUTEN	Minelayer (Sokuten class)	Sunk 7/25/44 Malakal Harbor, Palau (07° 20' N, 134° 27' E)	TF-58 aircraft
KAHOKU MARU	Auxiliary minelayer	Sunk 6/8/43 N of Palau (08° 58' N, 134° 14' E)	U.S. submarine FINBACK
NICHIYU MARU	Auxiliary minelayer	Sunk 7/16/44 Apra Harbor, Guam	Surface ship bombardment
OKINAWA MARU	Merchant cable ship	Sunk 5/10/44 SE of Guam (11° 31' N, 143° 41' E)	U.S. submarine SILVERSIDES

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
HIRO MARU	Netlayer (auxiliary)	Sunk 1/31/44 NNW Saipan	U.S. submarine TULLIBEE
KASHIMA MARU	Netlayer (auxiliary)	Severely damaged 2/1/42 at Kwajalein, later stricken, probably scrapped or destroyed by Japanese prior to end of war	CV ENTERPRISE aircraft
KOEI MARU	Netlayer (auxiliary)	Sunk 9/21/42 S of Truk	U.S. submarine TROUT
KOKKO MARU	Netlayer (auxiliary)	Sunk 6/12/44 180 nm NW of Saipan	Aircraft
NISSHO MARU NO. 5	Netlayer (auxiliary)	Sunk 3/30/44 at Palau	Aircraft
SHOFUKU MARU	Netlayer (auxiliary)	Sunk 8/7/42 off Wotje	U.S. submarine TAMBOR
SHOSEI MARU	Netlayer (auxiliary)	Beached 3/30/44 at Palau; probably no longer exists	Aircraft
W-22	Minesweeper (W-19 class)	Sunk 11/11/44 at Babelthaup, Palau	Mine
CH-6	Submarine chaser (CH-1 type, also known as CH-7 class)	Damaged and beached 3/30/44 at Babelthaup, Palau	Aircraft
CH-10	Submarine chaser (CH-1 type, also known as CH-7 class)	Stranded in Palau 5/2/44 (approx 7° 20' N, 134° 30' E)	Operational accident

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
CH-12	Submarine chaser (CH-1 type, also known as CH-7 class)	Lost 8/44 off Palau	Unknown
CH-24	Submarine chaser (modified CH-1 type)	Sunk 2/17/44 W of Truk by gunfire (07° 10' N, 177° 42' E)	DD BURNS
CH-29	Submarine chaser (modified CH-13 type)	Sunk 2/18/44 off Truk (07° 25' N, 151° 45' E)	Aircraft
CHA-14	Auxiliary submarine chaser (CHA-1 class)	Sunk 1/30/44 Mili Atoll, Marshall Islands	Aircraft
CHA-18	Auxiliary submarine chaser (CHA-1 class)	Sunk 1/30/44 at Kwajalein	Aircraft
CHA-19	Auxiliary submarine chaser (CHA-1 class)	Sunk 1/30/44 at Mili Atoll	Aircraft
CHA-21	Auxiliary submarine chaser	Sunk 1/30/44 at Kwajalein	TF-58 aircraft
CHA-22	Auxiliary submarine chaser	Sunk 3/1/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
CHA-26	Auxiliary submarine chaser	Sunk 3/1/44 at Palau	TF-58 aircraft
CHA-28	Auxiliary submarine chaser	Sunk 1/30/44 at Mili Atoll	TF-58 aircraft
CHA-38	Auxiliary submarine chaser	Sunk 4/30/44 at Truk	TF-58 aircraft
CHA-52	Auxiliary submarine chaser	Lost 10/25/44 at Palau (07° 30' N, 134° 30' E)	Possible operational loss

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
CHA-53	Auxiliary submarine chaser	Sunk 3/30/44 at Palau	T-58 aircraft
CHA-54	Auxiliary submarine chaser	Sunk 6/15/44 at Rota	TF-58 aircraft
CHA-66	Auxiliary submarine chaser	Sunk 8/7/45 (?) at Truk	Aircraft

The next six ships are requisitioned small merchant vessels, motor or steam trawlers and the like, as differentiated from the previous purposely built ships.

FUJI MARU NO. 11	Auxiliary submarine chaser	Sunk 2/6/44 at Kwajalein	TF-58 aircraft
KYO MARU NO. 6	Auxiliary submarine chaser	Grounded 11/27/43, Namu Island, Marshalls	Operational loss
KYO MARU NO. 8 & 10	Auxiliary submarine chasers	Possibly sunk at Saipan, 2/23/44	Aircraft
SAPPORO MARU	Auxiliary submarine chaser	Sunk 5/4/44 at Truk	Aircraft
SHONAN MARU NO. 10	Auxiliary submarine chaser	Sunk 2/1/42 at Kwajalein	CV ENTERPRISE aircraft
SHONAN MARU NO. 15	Auxiliary submarine chaser	Possibly sunk 2/17/44 at Truk	TF-58 aircraft
T-1	High-speed transport (T-1 type)	Sunk 7/27/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
T-150	Tank ⁶ 7 landing ship (type 101 and 103)	Sunk 7/27/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
AKAGI MARU	Armed ⁸ merchant cruiser (transport)	Sunk 2/17/44 NW of Truk (07° 54' N, 151° 24' E)	TF-58 aircraft
KIYOZUMI MARU	Armed merchant cruiser (transport)	Sunk 2/17/44 at Truk following damage 1/1/44 from submarine	TF-58 aircraft
BANGKOK MARU	Armed merchant cruiser (transport)	Sunk 3/20/43 E of of Jaluit Atoll (05° 47' N, 169° 42' E)	U.S. submarine POLLACK
AIKOKU MARU	Armed merchant cruiser (transport)	Sunk 2/17/44 at Truk	TF-58 aircraft
HEIAN MARU	Auxiliary sub- marine depot ship	Sunk 2/17/44 at Truk	TF-58 aircraft

⁶There were four Navy ES type landing craft (SS-8, 10, 14 and 15) lost during World War II--date, cause and location unknown. It is possible some of these may have been lost in the Central Pacific area.

⁷The Imperial Navy and Army ordered about 5,555 small (10-to-17 meter) landing craft of varying capacities and configurations. All were commonly referred to by the Allies as "Daihatsu" landing craft. It is certain they were used in all island areas under Japanese control in the Central Pacific for transport and small craft duties around the many island bases, particularly Palau, which served for part of the war as an amphibious training center.

⁸Somewhat of a misnomer, as armed merchant cruisers did not operate as such except briefly in the Indian Ocean and South Pacific. All ships on this list were being used as transports when lost.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
RIO DE JANEIRO MARU	Auxiliary submarine depot ship	Sunk 2/17/44 at Truk	TF-58 aircraft
YASUKUNI MARU	Auxiliary submarine depot ship	Sunk 1/31/44 NW of Truk (09° 12' N, 147° 13' E)	U.S. submarine TRIGGER
AKASHI	Repair ship	Sunk 3/30/44 at Palau	TF-38 aircraft
ASAKAZE MARU	Collier/supply ship	Sunk 12/5/43 at Roi, Kwajalein Island	Aircraft
IWASHIRO MARU	Collier/supply ship	Sunk 1/15/43 off Kwajalein	U.S. submarine WHALE
SANSEI MARU NO. 2	Collier/supply ship	Damaged 9/15/43 N of Truk (subsequent fate not known).	U.S. submarine HADDOCK
SHINSEI MARU NO. 6	Collier/supply ship	Sunk 8/21/42 off Ponape	U.S. submarine TAMBOR
SHINY-UBARI MARU	Collier/supply ship	Sunk 2/23/44 W of Saipan	U.S. submarine SUNFISH
SOYO MARU	Collier/supply ship	Sunk 12/7/42 N of Truk	U.S. submarine POGY
SATA	Naval tanker	Sunk 3/30/44 at Palau	TF-58 aircraft
IRO	Naval tanker	Sunk 3/30/44 at Palau	TF-58 aircraft
OSE	Naval tanker (captured Dutch GENOTA)	Sunk 3/30/44 at Palau	TF-58 aircraft

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
KAZAHAYA	Naval tanker	Sunk 9/6/43 240 nm NW of Truk (10° 01' N, 148° 31' E)	U.S. submarines TINOSA and STEELHEAD

The following 15 ships were merchant tankers converted for naval use. Most were requisitioned.

NOTE: The war standard merchant ships, of which approximately 1,100 were built or being built through 8/45, are not listed by location of loss in Warships of the Imperial Japanese Navy, 1869-1945. Most are known only through being lost. JANAC report's latitude/longitude would have to be cross-referenced to determine losses among these vessels undoubtedly sustained in the Central Pacific area.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
ARIMA MARU	Fleet tanker	Sunk 4/3/43 N of Palau	U.S. submarine HADDOCK
CHOKO MARU	Fleet tanker	Sunk 2/5/44 off Saipan	U.S. submarine TANG
AKEBONO MARU	Fleet tanker	Sunk 3/30/44 at Palau	TF-58 aircraft
AMATSU MARU	Fleet tanker	Sunk 3/30/44 at Palau	TF-58 aircraft
FUJISAN MARU	Fleet tanker	Sunk 2/17/44 at Truk	TF-58 aircraft
GEN'YO MARU	Fleet tanker	Scuttled 6/20/44 W of Saipan after air attack	Aircraft
HOYO MARU	Fleet tanker	Sunk 2/17/44 at Truk after 11/6/43 damage from submarine	Aircraft
KAIJO MARU NO. 2	Fleet tanker	Sunk 3/5/42 off Truk	U.S. submarine GRAMPUS

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
KEN'YO MARU	Fleet tanker	Sunk 1/14/44 SE of Palau	U.S. submarine GUARDFISH
SAN CLEMENTE (KUREMENTE) MARU	Fleet tanker	Sunk 5/4/43 off Palau	U.S. submarine SEAL
SHINKOKU MARU	Fleet tanker	Sunk 2/17/44 off Truk	TF-58 aircraft
TERUKAWA MARU	Fleet tanker	Sunk 12/21/43 NW of Truk	U.S. submarine SKATE
TOA MARU	Fleet tanker	Sunk 11/25/43 N of Ponape	U.S. submarine SEARAVEN
TOEI MARU	Fleet tanker	Sunk 1/18/43 100 nm SW of Truk	U.S. submarine SILVERSIDES
TONAN MARU NO. 3	Fleet tanker	Sunk 2/17/44 at Truk	TF-58 aircraft

Table 8.6. Representative List of Japanese Merchant Auxiliary Vessels Sunk Within the Central Pacific Islands.

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
AKIBASAN MARU	Transport	Sunk 1/30/44 SW of Ujae Atoll, Marshall Islands	DD BURNS
AIKOKU MARU	Guard boat	Sunk 6/30/44 at Kwajalein	Coastal artillery
AMAGISAN MARU	Transport	Sunk 2/17/44 at Truk	TF-58 aircraft
ARATAMA MARU	Ammunition ship	Sunk 4/8/44 S of Guam (now in Talafofo Bay, Guam)	U.S. submarine SEAHORSE

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
ATLANTIC MARU (ATORAN CHIKKU MARU)	Transport	Sunk 3/30/44 off Guam	U.S. submarine PICUDA
BANSHU MARU NO. 5 (ex NO.15)	Depot ship	Lost en route to Yokohama from Truk about 4/15/43	Unknown
BATAVIA MARU (BATABIA)	Transport	Sunk 6/13/44 160 nm NNW of Saipan	TF-58 aircraft
BORDEAUX MARU (BORUDO)	Transport	Sunk 2/1/42 at Kwajalein	CV ENTERPRISE aircraft
CHIYO MARU	Store ship (?)	Sunk 5/26/44 W of Marianas	U.S. submarine TAMBOR
CHOAN MARU NO 2 (ex CHOAN MARU)	Gunboat	Sunk 5/10/44 N of Carolines (11° 31' N, 143° 41' E)	U.S. submarine SILVERSIDES
CHOKO MARU	Transport	Sunk 12/5/43 off Kwajalein	TF-50 aircraft
CHOKO MARU NO. 2 (ex CHOKO MARU)	Gunboat	Sunk 1/12/44 SW of Truk (03° 37' N, 147° 27' E)	U.S. submarine ALBACORE
DAIDO MARU	Gunboat	Sunk 12/4/43 NE of Ponape (9° 06' N, 159° 02' E)	U.S. submarine APOGON
EBISU MARU NO. 11	Guard boat	Sunk 7/8/44 off Saipan	Aircraft
EIKO MARU NO. 2	Transport	Damaged by aircraft 12/5/43 at Kwajalein; sunk by gunfire 1/30/44 at Kwajalein	Aircraft/ surface ships
FUJIKAWA MARU	Aircraft transport	Sunk 2/17/44 at Truk	TF-58 aircraft

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
FUKUEI MARU NO. 3	Guard boat	Sunk 7/8/? off Saipan (probably 1944)	Aircraft
FUKUYAMA MARU	Gunboat	Sunk 2/22/44 40 nm W of Saipan (14° 47' N, 144° 50' E)	U.S. submarine TANG
FUKUYOSHI MARU NO. 5	Guard boat	Wrecked 1/5/44 at Wotje	Aircraft
GORYU MARU	Water tanker	Sunk 2/4/44 at Jaluit, Marshall Islands	TF-58 aircraft
GOSEI MARU	Transport	Sunk 2/17/44 at Truk	TF-58 aircraft
GOSHU MARU	Aircraft transport	Sunk 3/30/44 at Palau	TF-58 aircraft
GOZAN MARU	Transport	Sunk 3/30/44 at Palau	TF-58 aircraft
HAKKAISAN MARU	Gunboat	Sunk 10/22/42 80 nm SW of Tamana, Kiribati Islands (03° 30' S, 175° 15' E)	DD gunfire
HANAKAWA MARU	Transport	Sunk 2/17/44 at Truk	TF-58 aircraft
HARUNA MARU	Victualling stores ship (reefer)	Sunk 1/16/44 SW of Palau	Collision with KYOEI MARU
HARUTA MARU	Guard boat	Sunk 6/23/44 off Pagan, Mariana Islands	Aircraft
HEIJO MARU	Gunboat	Sunk 9/4/43 SW of Ponape (05° 25' N, 156° 37' E)	U.S. submarine ALBACORE

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
HEIYO MARU	Troop transport	Sank 1/21/43 NE of Truk following 1/17/43 submarine attack	U.S. submarine WHALE
HINO MARU NO. 2	Gunboat	Sank 5/4/44 follow- ing 4/30/44 attack on Truk (07° 20' N, 151° 45' E)	TF-58 aircraft
HIROSHI MARU NO. 5	Guard boat	Sunk 7/10/44 at Saipan	Uncertain-- probably aircraft
HOKKO MARU	Victualling stores ship (reefer)	Sunk 3/20/44 off Yap	U.S. submarine PICUDA
HOKOKO MARU NO. 2	Guard boat	Sunk 1/30/45 off Ujae (08° 42' N, 167° 44' E)	US DD BURNS
HOKUYO MARU	Transport	Sunk 2/17/44 at Truk	TF-58 aircraft
HORAISAN MARU) (ex-DAIHO MARU NO. 1)	Transport	Sunk 5/20/44 NW of Saipan	U.S. submarine SILVERSIDES
HOSEI MARU NO. 1	Guard boat	Sunk 7/8/44 at Saipan	Aircraft
HYUGA MARU	Victualling stores ship	Sunk 3/16/43 W of Marianas	U.S. submarine FLYING FISH
IBARAKI MARU	Guard boat	Sunk 3/30/44 at Palau	TF-58 aircraft
IKUSHIMA MARU	Gunboat (rerated transport 5/42)	Sunk 4/30/44 NW of Marianas STINGRAY	U.S. submarine
IKUTA MARU	Gunboat	Sunk 1/12/44 at Kwajalein (08° 42' N, 167° 44' E)	Aircraft

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
IMIZU MARU	Gunboat (transport 5/42)	Sunk 6/12/44 at Saipan (17° 32' N, 144° 10' E)	TG-58.4 aircraft
ISUZUGAWA MARU	Guard boat	Sunk 7/1/44 NW of Marianas (31° 26' N, 141° 11' E)	U.S. submarine BATFISH
JOZAN MARU	Transport	Sunk 2/17/44 SW of Truk	Possibly U.S. submarine CERO
KAHOKU MARU	Gunboat	Sunk 7/8/43 N of Palau (08° 58' N, 134° 14' E)	U.S. submarine FINBACK
KAIHEI MARU	Transport	Sunk 4/15/43 NE of Marianas	U.S. submarine SEAWOLF
KAIKA MARU	Transport	Sunk 4/16/44 S of Carolines (4° 04' N, 148° 14' E)	U.S. submarine BLACKFISH
KAIKO MARU	Guard boat	Sunk 9/15/44 in Marshalls	Aircraft
KAISHO MARU	Transport	Sunk 8/22/43 between Truk and Guam (10° 09' N, 147° 25' E)	U.S. submarine TULLIBEE
KAIYO MARU	Guard boat	Sunk 1/16/44 at Maloelap Atoll, Marshalls	Aircraft
KAMIKAZE MARU	Torpedo port/repair ship	Sunk 3/30/44 at Palau	TF-58 aircraft
KAMO MARU	Guard boat	Sunk 7/1/44 NW of Marianas (21° 26' N, 141° 11' E)	U.S. submarine BATFISH
KATSURIG- ISAN MARU	Transport	Sunk 1/4/44 NE of Truk	Japanese mine

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
KAZU MARU NO. 1	Guard boat	Sunk 9/15/44 in Marshalls	Aircraft
KEIYO MARU	Aircraft transport	Beached 6/12/44 on Saipan	TF-38 aircraft
KEMBU MARU (captured vessel, previous ID unknown)	Transport	Sunk 12/4/43 at Kwajalein	TF-50 aircraft
KENAN MARU	Transport	Sunk 5/3/44 NW of Tinian (150° 29' N, 145° 42' E)	U.S. submarine SANDLANCE
KENSHO MARU	Transport	Sunk 2/17/44 at Truk	TF-58 aircraft
KIKUKAWA MARU	Transport	Lost by fire 10/7/43 at Truk	Operational accident
KIKYO MARU	Guard boat	Sunk 2/6/44 at Kwajalein	TF-58 aircraft
KINAI MARU	Transport	Sunk 5/10/43 E of Saipan	U.S. submarine PLUNGER
KITSUGAWA MARU	Water tanker	Sunk 6/27/44 at Guam after 4/8/44 damage from submarine SEAHORSE	TF-58 aircraft and SEAHORSE
KOMPIRA MARU	Guard boat	Sunk 6/21/44 off Tinian	Gunfire
KOMPIRA MARU NO. 1	Guard boat	Possibly sunk at Tinian 7/44	Aircraft (?)
KOSEI MARU (ex-NARENTA, ex-NEGANTI)	Victualling stores ship	Sunk 4/8/43 NW of Truk (08° 50' N, 147° 06' E)	U.S. submarine TUNNY
KOTOHIRA MARU	Guard boat	Sunk 4/15/44 at Truk, broken up	Aircraft (?)

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
KOTOSHIRO MARU	Guard boat	Sunk 4/4/45 in Marshalls	Aircraft
MANJU MARU (ex-JUFUKU MARU)	Transport	Sunk 11/29/43 W of Marianas (19° 30' N, 139° 58' E)	U.S. submarine PARGO
MARUDAI MARU	Guard boat	Sunk 6/17/44 at Saipan	TF-38 aircraft
MATSUTANI MARU	Transport	Sunk 2/17/44 at Truk (07° 23' N, 151° 05' E)	TF-58 aircraft
MEIHO MARU	Guard boat	Sunk 2/6/44 at Kwajalein	TF-58 aircraft
MEITEN MARU	Transport	Sunk 6/20/43 W off Marianas (15° 57' N, 140° 57' E)	U.S. submarine TAUTOG
MIIKE MARU	Transport	Sunk 4/27/44 SW of Yap (08° 34' N, 134° 49' E)	U.S. submarine TRIGGER
MIKAGE MARU NO. 18	Collier	Sunk 5/10/44 N of Carolines (11° 26' N, 143° 46' E)	U.S. submarine SILVERSIDES
MISAKU MARU	Transport	Sunk 4/9/44 W of Marianas (15° 32' N, 145° E)	U.S. submarine SEAHORSE
MITAKESAN MARU	Transport	Sunk 5/11/44 W of Marianas (14° 57' N, 143° 30' E)	U.S. submarine SANDLANCE
MOMOKAWA MARU	Transport	Sunk 2/17/44 at Truk (07° 20' N, 151° 53' E)	TF-58 aircraft
MUKO MARU	Transport	Sunk 11/12/43 N of Truk (09° 20' N, 152° 46' E)	U.S. submarine THRESHER

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
NAGISAN MARU	Transport	Sunk 4/30/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
NANIWA MARU	Transport	Sunk 8/3/42 W of Palau (07° 17' N, 150° 46' E)	U.S. submarine GUDGEON
NANKAI MARU NO. 2	Transport	Sunk 12/23/43 at Mili Atoll, Marshalls (06° 05' N, 171° 43' E)	Aircraft
NARUTO MARU	Ammunition ship	Sunk 8/8/43 NW of Marianas (23° 15' N, 142° 45' E)	U.S. submarine WHALE
NEIKAI MARU	Transport	Sunk 1/27/44 S of Truk (03° 45' N, 150° 38' E)	Aircraft
NICHIEI MARU	Guard boat	Sunk 1/30/44 off Ujae Atoll (08° 42' N, 166° E)	US DD BURNS
NICHIRO MARU	Ammunition ship	Sunk 2/17/44 off Palau (08° 50' N, 135° 40' E)	U.S. submarine SARGO
NIKKAI MARU	Gunboat (rerated transport 10/43)	Sunk 11/26/43 SW of Truk (04° 12' N, 148° 20' E)	U.S. submarine RAY
NIKKO MARU	Transport	Sunk 11/20/43 NE of Marianas (23° 10' N, 147° 22' E)	U.S. submarine HARDER
NIPPO MARU	Water carrier	Sunk 2/17/44 at Truk (07° 20' N, 151° 40' E)	TF-58 aircraft
NITCHO MARU	Transport	Sunk 6/12/44 W of Marianas (17° 31' N, 143° 10' E)	TG-58.4 aircraft

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
OGASHIMA MARU	Transport	Sunk 1/20/44 off Namu Atoll, Marshalls (08° 07' N, 168° E)	Aircraft
OKITSU MARU	Transport	Sunk 1/26/44 N of Ponape (09° 30' N, 157° 50' E)	U.S. submarine SKIPJACK
PALAU MARU (PARAU)	Guard boat	Sunk 2/6/44 at Kwajalein	TF-58 aircraft
RAIZAN MARU	Transport	Sunk 3/30/44 off Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
REIKAI MARU	Transport	Sunk 6/12/44 NW of Saipan (17° 30' N, 144° E)	TF-58 aircraft
REIYO MARU	Transport	Sunk 2/17/44 at Truk (07° 25' N, 151° 45' E)	TF-58 aircraft
RYOJUN MARU	Gunboat	Sunk 7/26/44 near Palau (07° 30' N, 134° 30' E)	Aircraft
RYOTAKU MARU	Transport	Sunk 9/22/43 NW of Marianas (20° 45' N, 142° 10' E)	U.S. submarine TROUT
RYUKO MARU	Transport	Sunk 3/30/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
SACHITAKA MARU NO. 3	Guard boat	Sunk 7/8/44 at Saipan	Aircraft
SAGAMI MARU	Transport	Sunk 11/3/42 at Palau (07° 02' N, 125° 33' E)	U.S. submarine SEAWOLF

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
SAN FRANCISCO MARU (S. FURANSHISUKO)	Transport	Sunk 2/17/44 at Truk (07° 22' N, 151° 54' E)	TF-58 aircraft
SANTO MARU	Gunboat	Sunk 9/29/43 off Saipan (15° 28' N, 145° 59' E)	U.S. submarine GUDGEON
SEIEI MARU NO. 2	Guard boat	Sunk 3/30/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
SEIKO MARU	Transport	Sunk 2/17/44 at Truk (07° 22' N, 151° 45' E)	TF-58 aircraft
SEIZAN MARU (ex-SHING HO, ex-CAPE PREMIER, ex-BARUNGA, ex-WAR FAITH)	Transport	Sunk 2/23/44 near Saipan (15° N, 145° 30' E)	Aircraft
SENKEI MARU	Gunboat	Sunk 10/7/42 in S. Carolines (01° 10' N, 153° 31' E)	U.S. submarine AMBERJACK
SHIGAN-OURA MARU	Transport	Sunk 11/30/43 W of Marianas (18° 38' N, 139° 35' E)	U.S. submarine SNOOK
SHINKOKU MARU	Transport	Sunk 2/28/43 S of Saipan (15° 09' N, 159° 30' E)	U.S. submarine HALIBUT
SHINSEI MARU NO. 18	Transport	Sunk 3/30/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
SHINSHU MARU	Torpedo recovery vessel	Sunk 7/9/42 at Kwajalein (08° 43' N, 167° 33' E)	U.S. submarine THRESHER

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
SHOAN MARU	Transport	Sunk 2/23/44 at Saipan (15° 15' N, 145° 42' E)	TF-58 aircraft
SHOEI MARU (ex-GENERAL, ex- OAKWIN, ex-WAR OASIS)	Transport	Sunk 12/19/43 at Kwajalein (08° 42' N, 167° 44' E)	Aircraft
SHOEI MARU	Gunboat	Sunk 5/25/43 off Rota, Marianas (14° 17' N, 144° 50' E)	U.S. submarine WHALE
SHOEI MARU	Gunboat	Sunk 3/30/44 near Palau	Aircraft
SHOHO MARU	Transport	Sunk 12/31/43 in E. Carolines (05° 40' N, 160° 20' E)	U.S. submarine GREENLING
SHOKA MARU	Transport	Sunk 5/25/42 in Carolines (04° 05' N, 144° E)	U.S. submarine TAUTOG
SHOKEN MARU	Transport	Sunk 5/29/44 W of Marianas (16° 19' N, 145° 25' E)	U.S. submarine SILVERSIDES
SHOKO MARU	Gunboat (rerated transport 11/43)	Sunk 12/1/43 N of Ulithi Atoll (14° 31' N. 140° 18' E)	U.S. submarine PARGO
SHOSEI MARU	Gunboat	Sunk 5/20/44 10 nm W of Guam (13° 32' N, 144° 36' E)	U.S. submarine SILVERSIDES
SHOTOKU MARU	Gunboat	Sunk 6/28/43 off Rota, Marianas (14° 07' N, 145° 07' E)	U.S. submarine TUNNY

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
SHOUN MARU	Transport	Sunk 6/23-24/44 at Rota (14° 10' N, 145° 10' E)	TF-58 aircraft
SHUNZAN MARU NO. 2	Transport	Sunk 2/24/44 off Kosrae, Carolines (05° 20' N, 162° 58' E)	Aircraft
TAIAN MARU	Transport	Sunk 1/23/44 S of Palau (05° 50' N, 134° 14' E)	U.S. submarine GAR
TAIHO MARU	Transport	Sunk 2/17/44 at Truk (07° 22' N, 151° 34' E)	TF-58 aircraft
TAIHOSAN MARU	Water carrier	Sunk 3/12/43 off Ponape (07° 15' N', 158° 45' E)	U.S. submarine PLUNGER
TAIJUN MARU	Transport	Burned at Truk 4/11/42	Operational accident
TAIKOKU MARU	Transport	Sunk 5/17/44 W of Marianas (14° 58' N, 144° 49' E)	U.S. submarine SANDLANCE
TAITO MARU	Transport	Sunk 5/25/44 N of Palau (11° 14' N, 135° 12' E)	U.S. submarine FLYING FISH
TAKEURA MARU	Guard boat	Sunk 2/6/44 at Kwajalein	TF-58 aircraft
TAMA MARU	Transport	Sunk 7/4/44 off Palau (07° 44' N, 133° 17' E)	U.S. submarine GUAVINA
TAMAHIME MARU (ex-WAR SPRAY)	Transport	Sunk 6/5/44 W of Marianas (18° 40' N, 140° 35' E)	U.S. submarine SHARK
TAMASHIMA MARU	Transport	Sunk 1/30/44 NE of Marianas (21° 12' N, 149° 18' E)	U.S. submarine SPEARFISH

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
TEMPOSAN MARU	Transport	Sunk 12/29/43 off Palau (08° 03' N, 133° 51' E)	U.S. submarine SILVERSIDES
TENRYU- GAWA MARU	Transport	Sunk 6/12/44 NW of Saipan (17° 32' N, 144° 10' E)	TF-38 aircraft
TERUSHIMA MARU	Gunboat	Sunk 5/18/43 in Marshalls (08° 33' N, 171° E)	U.S. submarine POLLACK
TOEI MARU	Transport	Sunk 2/1/44 in Carolines (04° 24' N, 143° 15' E)	U.S. submarine SEAHORSE
TOHO MARU (ex-ARDGAY, ex-ERNEMORE)	Transport	Sunk 6/1/44 NW of Marianas (18° 08' N, 141° 14' E)	U.S. submarine PINTANO
TOKAI MARU	Transport	Sunk 8/27/43 in Apra Harbor, Guam after previous damage in harbor by FLYING FISH	U.S. submarine SNAPPER and FLYING FISH
TONEI MARU	Transport	Sunk 10/1/43 in S Carolines (04° 01' N, 143° 47' E)	U.S. submarine PETO
TOYO MARU NO. 2	Transport	Sunk 4/2/43 W of Truk (07° 32' N, 149° 18' E)	U.S. submarine TUNNY
TOYOHAMA MARU	Guard boat	Wrecked 10/8/42 at Wotje	Operational accident
TOYOTSU MARU	Gunboat	Sunk 2/1/42 at Kwajalein (09° 12' N, 167° 18' E)	CV ENTERPRISE aircraft
TSUNU- SHIMA MARU	Transport	Sunk 10/20/43 S of Truk (01° 26' N, 148° 36' E)	U.S. submarine GATO

<u>Name</u>	<u>Type</u>	<u>Date/Location</u>	<u>Agency</u>
UDO MARU	Transport	Sunk 11/19/43 N of Marianas (22° 28' N, 147° 22' E)	U.S. submarine HARDER
UNKAI MARU NO. 6 (ex-VENUS)	Transport	Sunk 2/17/44 at Truk (07° 25' N, 115° 45' E)	TF-58 aircraft
UKARAMI MARU	Salvage vessel	Sunk 3/30/44 at Palau (07° 30' N, 134° 30' E)	TF-58 aircraft
YAMAFUKU MARU	Transport	Sunk 11/28/43 NW of Marianas (18° 21' N, 40° 08' E)	U.S. submarine SNOOK
YAMAGIRI MARU	Transport	Sunk 2/17/44 at Truk (07° 23' N, 151° 51' E)	TF-58 aircraft
YAMAKISAN MARU (captured Panamanian ship)	Transport	Sunk 2/17/44 at Truk (07° 25' N, 151° 45' E)	TF-58 aircraft
YAMASHIMO MARU	Repair ship	Sunk 2/22/44 W of Saipan (14° 45' N, 144° 32' E)	U.S. submarine TANG
YAMASHIRO MARU	Guard boat	Sunk 2/6/44 at Kwajalein	TF-58 aircraft
YAMATO MARU NO. 2	Transport	Possibly sunk 11/22/43 S of Palau (07° 09' N, 134° 34' E)	U.S. submarine TINOSA
ZUKAI MARU	Transport	Sunk 2/17/44 NW of Truk (07° 46' N, 150° 27' E)	TF-58 aircraft

Of particular interest are the many sites located in Belau. Sixty-six Japanese ships were lost in that archipelago, second only to Truk's seventy-five. Sport diving on these sites has increased dramatically in the last 10 years. With it has also come the desire to accurately identify the individual wreck sites. Efforts in that regard have been made by Lindemann (1988) and Bailey (1986). The difficulties

associated with ship identification and the haste with which they are often made have resulted in a number of identification errors. A critical aspect of the identification process, often overlooked, is archival research. That avenue can often provide the only clues that can unequivocally identify a particular wreck.

A well-known map of ship losses, based upon aerial photography taken on March 30 and 31, 1944, by U.S. planes, has been used as a guide to search for ships. Numbered and with general type indicated on the original, the sites mainly lie within Ngeruktable (Urukthapel) Anchorage and Ngemelachel (Malakal) Harbor. Only the locations of the first 30 were indicated on the map; 7 others merely have a notation in the corner. Information on all 37 is provided in Table 8.7. The original map has been redrawn as Figure 8.8 for clarity. The number and Naval designations for each ship, as a result of intelligence evaluation, are provided below.

Table 8.7. Key to Base Map of World War II Ship Losses in Belau's Major Anchorages

Number 1:	Small AK sunk
Number 2:	Small AK damaged, not seen in later photo
Number 3:	Small AK sunk
Number 4:	Medium AK sunk
Number 5:	Small AK sunk
Number 6:	Large AO sunk
Number 7:	Small AK beached
Number 8:	Small AK beached, damaged
Number 9:	Large AK beached, badly damaged
Number 10:	Small AO sunk
Number 11:	Small AK beached, damaged
Number 12:	Medium AK, sunk
Number 13:	Small AK beached, damaged
Number 14:	Small AK beached, burning fiercely
Number 15:	Small AO beached, burning fiercely
Number 16:	Large repair ship beached, down at bow, burning fiercely
Number 17:	Small AK sunk
Number 18:	Small AK sunk
Number 19:	ODD damaged
Number 20:	Medium AO sunk
Number 21:	Medium AK beached, damaged
Number 22:	Large AO sunk
Number 23:	Large AK sunk
Number 24:	Small AO beached, burning fiercely
Number 25:	Large AO sunk
Number 26:	Medium AO, burning fiercely
Number 27:	Small AK beached, damaged
Number 28:	Medium AK sunk

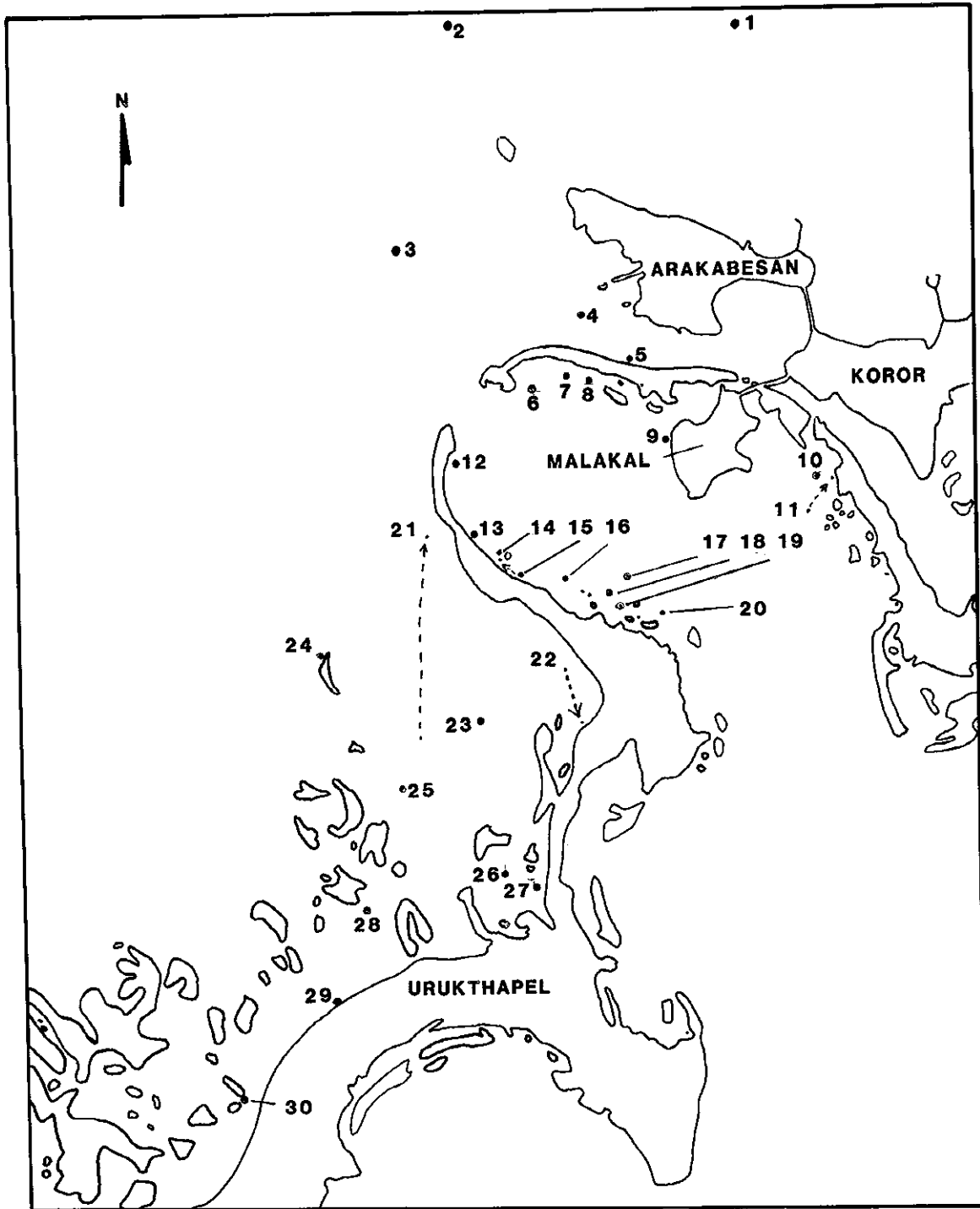


Fig. 8.8. Damage to shipping in and around Palau Harbor from photographs of March 30 and March 31, 1944. (Redrawn from original)

- Number 29: Medium AK sunk
- Number 30: Unidentified, probably ODD, PC or CM sunk
- Number 31: Small AK sunk off Karamadoo Wan
- Number 32: Small AK beached off SE Babelthaup
- Number 33: ODD sunk in open sea
- Number 34: Medium AK sunk, uncharted
- Number 35: Small Ak burning fiercely west of Angaur
- Number 36: Medium AK beached and damaged on reef
- Number 37: ODD sunk in Karamadoo Wan

Although the 1944 map is extremely useful for general locations and type of ship, it does nothing to help clear up their identification. As part of the research for the joint US Naval Reserve-National Park Service operation in Belau in 1988, interviews were conducted with local residents who were in Belau during the war years. In particular, the individuals had some knowledge of postwar salvage operations by Japanese companies. Those interviews led to the identification of the company that conducted most of the salvage in and around Belau, Fujita Salvage. The Japanese company still exists and, after an exchange of letters, the owner, Mr. Fujita, agreed to release copies of the only documents still retained by him on the salvage of the wrecks. Recent translation from the Japanese has resulted in more complete information on the identity and location of 27 sites. A portion of that information is provided below.

Table 8.8. Names, Locations and Depths of World War II Japanese Ships Sunk in Belau

<u>Name</u>	<u>Location</u>	<u>Depth (meters)</u>
GOZAN MARU	7°19'36" N 134°25'50" E	15
AKASHI	7°18'54" N 134°26'32" E	12
Tanker	7°20'22" N 134°26'44" E	4
HOKUTAI MARU	7°19'46" N 134°27'13" E	7
Landing craft (tank)	7°19'50" N 134°27'16" E	1
T.150	7°20'26" N 134°26'26" E	7

<u>Name</u>	<u>Location</u>	<u>Depth (meters)</u>
URAKAMMI MARU	7°18'42" N 134°26'53" E	39
OSE	7°18'41" N 134°27'14" E	14
AMATSU MARU	7°20'10" N 134°26'23" E	40
GOSHU MARU	7°20'42" N 134°26'48" E	16
KIBI MARU	7°18'55" N 134°26'55" E	14
MATSUEI MARU	7°18'49" N 134°26'52" E	17
Whaler	7°18'01" N 134°27'22" E	10
Whaler	7°17'59" N 134°27'24" E	13
Minesweeper	7°18'41" N 134°26'44" E	7
Sub chaser	7°18'41" N 134°26'37" E	7
Whaler	7°17'55" N 134°27'25" E	8
RAIZAN MARU	7°20'50" N 134°26'12" E	33
Tanker	7°19'33" N 134°28'20" E	13
Watch boat	7°20'27" N 134°26'52" E	10
AKEBONO MARU	7°17'58" N 134°26'38" E	11-26
Work boat with crane	7°19'14" N 134°28'39" E	7

<u>Name</u>	<u>Location</u>	<u>Depth (meters)</u>
SHINSEI MARU No. 18	7°19'7" N 134°25'45" E	27
Water supply boat	7°20'4" N 134°28'0" E	2
KAMIKAZE MARU	7°16'35" N 134°25'9" E	32
ASASHIO MARU	7°21'30" N 134°25'35" E	40
Special ore crusher	7°20'36" N 134°32'15" E	7

Cross-checking between the latitudes and longitudes given in Table 8.8 and the locations generated during the 1988 U.S. Navy-National Park Service project of known and identified sites resulted in an excellent match. Clearly, both the identifications given and their locations remove any doubt about the names of more than two dozen ships in Belau.

Other Known Sites

Above and beyond the Japanese shipping losses, four U.S. ships were lost in the battle for Beliliou in 1944. They were LCI(G)-459, a gunboat; YMS-19, a minesweeper; USS TULLIBEE, a submarine; and PERRY, a destroyer/minesweeper. Another boat associated with the battle for Beliliou is the very deteriorated wreck of a wooden-hulled motor yacht. It is reported to have been used by General MacArthur.

In Guam, the station ship, PENGUIN, was bombed and severely damaged in 1941. The crew scuttled the ship in order to prevent its capture. There is also a report that the USS ROBERT L. BARNES, a tanker, was strafed and burned at Orote Point in Apra Harbor.

Ship Losses, 1946-1990

Immediately following World War II, 70 ships were involved in the atomic bomb testing at Bikini Atoll. Of those, 60 remained within the Marshall islands, either sinking directly as a result of the testing or scuttled later. Twenty-two ships remain either within the lagoon or in deep water offshore of Bikini. Thirty-eight ships from the test were

taken to Kwajalein and sunk or scuttled. Both groups are discussed in Chapter 7 of this publication.

At Guam, other sites, predominantly the remains of fishing boats and modern ships lost since 1946, have been located. These sites have not been documented; only preliminary identification has been completed. Their locations are based upon the work of Paul Edwards in 1979-1980. The number of each site was arbitrarily assigned by Edwards; the Guam Historic Preservation Office has continued to use Edwards' original list and designations. Those sites, as well as others not included in Chapter 9, are mapped onto a base map of Apra Harbor (Figure 8.9). The numbering system used is that assigned by Edwards.

Table 8.9. Key to Base Map of Apra Harbor Shipwreck Sites

Site Number	1:	Piti Back Bay--work boat
Site Number	2:	Piti Back Bay--work boat
Site Number	3:	Piti Back Bay--fishing boat
Site Number	5:	Gorco Pier--NICHYU MARU
Site Number	6:	Former Marianas Yacht Club--WHISPER
Site Number	7:	Former Marianas Yacht Club--yacht
Site Number	8:	Former Marianas Yacht Club--EXPLORER
Site Number	9:	Former Marianas Yacht Club--fishing boat
Site Number	10:	Former Marianas Yacht Club--ONDINE
Site Number	11:	Seaplane Ramp--tug
Site Number	12:	Dry Dock Island--YTM-419
Site Number	15:	Buoy #1--SMS CORMORAN
Site Number	16:	Buoy #1--TOKAI MARU
Site Number	17:	Southwest of Buoy #1--naval tug
Site Number	18:	Southwest of Buoy #1--KITSUGAWA MARU
Site Number	21:	Harbor Mouth--CARIBA
Site Number	22:	N of Harbor Mouth--CS SCOTIA

Other sites not included by Edwards but sunk at Guam since 1946 are the freighter GUAM BEAR (1967) off Orote Peninsula; PC-705, a patrol craft sunk in 1962 in Apra Harbor; PEACE OCEAN, a steel-hulled ship sunk 10 miles west of Apra Harbor in 1979; and SILDRE, a ship sunk 1 mile west of Facpi Point.

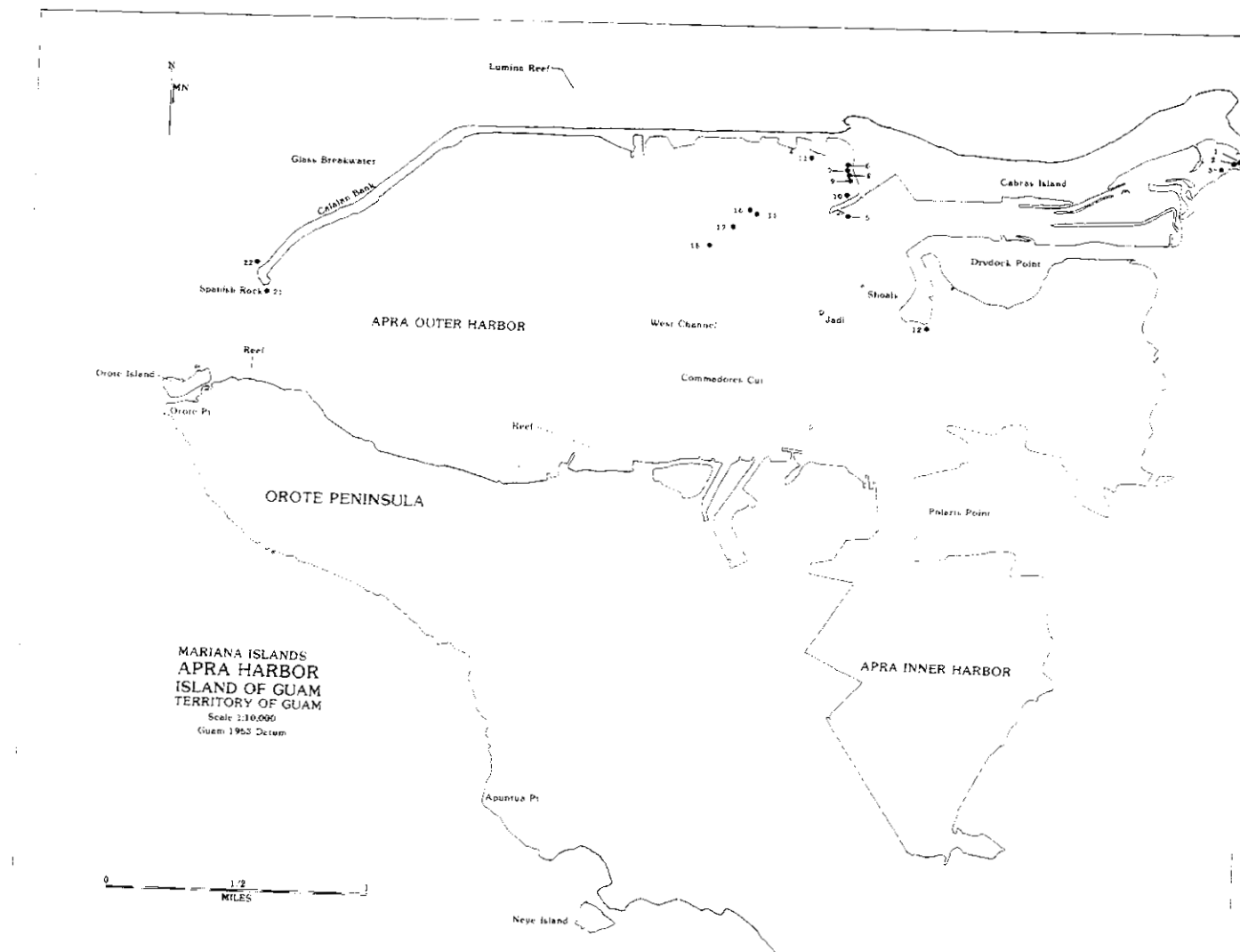


Fig. 8.9. Base map of known shipwreck sites in Apra Harbor (after Paul Edwards 1976).

CHAPTER IX.
SHIPWRECKS: THE ARCHEOLOGICAL RECORD

By Toni L. Carrell, Daniel J. Lenihan,
David T. Lotz and James E. Miculka¹

Introduction

This chapter is devoted to a discussion of shipwreck sites documented by the National Park Service's (NPS) Submerged Cultural Resources Unit (SCRU), GovGuam and the WAPA Submerged Resources Dive Team. They date from 1874, with the loss of the brig LEONORA in Kosrae, to the destruction of both merchant and warships during the atomic testing at Bikini in 1946. Most of the ships reported on were lost during World War II; this emphasis on "modern" ships is a function of the management orientation of most of the research activity. Larger, intact sites receiving heavy visitor use or having a potential for visitor use by sport divers received the greatest emphasis.

The scope of most of the shipwreck research was limited to the documentation of known sites, not to the search for those previously unlocated, although survey technology was often used to relocate some of the more obscure shipwrecks. Not all of the sites known to exist by the sport diver volunteers, park professionals and archeologists working on these projects were investigated. Rather, an effort was made to examine as many different site types as possible and to include those resources in this chapter. The coverage presented here is, therefore, neither comprehensive nor exhaustive but intended to be representative.

Of necessity, the site discussions and analyses are generally brief, reflecting constraints of time and space, not the individual significance of the ships. For example, the depth of information gathered on each of the sites in Guam and Palau could readily permit these reports to stand alone as

¹With contributions from Dennis Blackenbaker, William Cooper, Rose S.N. Manibusan and Edward Wood.

individual site reports in the SCRU report and publication series.

Sometimes capsulized results are presented because the material has been or will be published in a separate forum. For example, the results of the investigations on LEONORA in Kosrae were published by the Micronesian Archaeological Survey. The extensive research jointly conducted by the SCRU, the U.S. Navy and the Department of Energy on the ships in Bikini Lagoon, briefly discussed in this chapter, will be published as a separate report within the year (Delgado, Lenihan and Murphy). Also, conspicuous in its absence is a discussion of the shipwrecks in Chuuk Lagoon. Although the SCRU visited Chuuk in 1981 and dived on several sites in the lagoon, it was decided that little could be added to what has already been stated in the large body of available literature on this subject.

The purpose of this chapter is to provide a frame of reference, that is, the archeological context by which the known sites and those yet to be discovered can be measured. It is geared to allow the resource manager to evaluate both site significance and integrity and to establish minimal standards of site documentation for intersite comparisons. It should provide enough detail for interpreters to explain the "story" of the ship to the public--its loss, its use in the past, and its appearance today. This chapter is also designed to inform the wreck divers about the features of each site and, hopefully, to add to their enjoyment and increase their sensitivity when visiting these underwater museums.

The objective of field work was to gather as much descriptive data as possible given the constraints imposed by equipment, time and personnel resources. All research was completed using a nondestructive methodology emphasizing mapping of exposed wreckage, photography, artistic depictions, videotape and written description. No excavation was undertaken, nor were any artifacts removed. Logistics also influenced the overall research approach. Although the islands of Micronesia in the jet age are not as functionally remote as they were at the turn of this century, reaching them still entails considerable travel.

The research emphasized short, intense, field investigations that leaned very heavily upon volunteers, park professionals resident in the islands and U.S. Navy divers. As a result, this chapter contains written contributions from a wide variety of authors. The chapter is organized by island chain with island and site types grouped together for discussion and analysis.

Mariana Islands

Shipwreck investigations were undertaken on the islands of Saipan, Rota and Guam. Sites on Saipan lie within American Memorial Park and Saipan Lagoon. The sites investigated on Rota all lie within Sasanhaya Bay, whereas the ships on Guam are located either in Apra Harbor or Talafofo Bay.

Saipan

More than 40 documented ship losses have occurred in and around Saipan; the earliest known is the Manila galleon NUESTRA SENORA de la CONCEPCION, wrecked in 1638. Two other as yet unidentified ships were also lost in the vicinity of Saipan later in that century. The vast majority of ships, however, were sunk during World War II. Ranging from small Japanese guard boats to fleet tankers, transports and submarines, they total 38 shipwrecks.

To date, only five sites have received much attention: a small Japanese tug, an unidentified freighter and a submarine chaser from World War II, an unidentified small boat to which no date can be ascribed, and the Manila galleon. With the exception of the galleon, each of the other sites was investigated by the NPS or contract archeologists to the U.S. Army Corps of Engineers as part of resource assessment or environmental impact studies. These sites are discussed in this chapter. The galleon was excavated by the treasure salvage company, Pacific Sea Resources, in 1987-1988; no professional publication on their findings is known to be available; however, the site is discussed in National Geographic magazine, September 1990 edition.

American Memorial Park and Saipan Lagoon²

There have been a total of four assessment surveys carried out by the War in the Pacific National Historical Park (WAPA) submerged-research team. The first survey was carried out October 28-30, 1983, by James E. Miculka, Chief Ranger, and

²This section on shipwrecks within American Memorial Park was written by James E. Miculka and Rose S.N. Manibusan. The discussion of sites in Saipan Lagoon was written by James E. Miculka with contributions from Edward Wood, William Cooper and Dennis Blackenbaker.

Rose S.N. Manibusan, Park Ranger, WAPA. The focus of that survey was to locate and identify sites within American Memorial Park (Miculka and Manibusan 1983). It was also done to verify the existence of and gather statistical data on a previous partial survey conducted for the U.S. Army Corps of Engineers in March 1980.

A second survey was carried out on December 15-17, 1983. This survey was done to locate additional submerged resources and to follow up on sites not covered in the October survey (Manibusan and Miculka 1983).

A third survey was conducted in cooperation with the University of Guam's Micronesian Area Research Center (Miculka, Carter and Ichihara 1984). This was done on December 3-5, 1984, by James E. Miculka, Chief Ranger; Kevin J. Carter, Park Ranger; Jimmy C. Garrido, Park Ranger; and Nobuo Ichihara, exchange ranger from the Environment Agency, Government of Japan. The intent of the survey was to locate, identify and assess the underwater sites related to the Defense Environmental Restoration Program (DERP). The University of Guam and the Micronesian Area Research Center were awarded a contract to assess sites in the Mariana Islands. The WAPA research team was asked by the University of Guam to assist in the project. This was the first dive to explore waters outside the park and they covered areas of Saipan Lagoon.

The fourth assessment was carried out on January 22-25, 1990. The team consisted of James E. Miculka, Chief Ranger, WAPA; William Cooper, volunteer diver, WAPA; Dennis Blackenbaker, volunteer diver, WAPA; and Edward Wood, Ranger-in-Charge, American Memorial Park. The purpose of this survey was to locate, measure, photograph and videotape in detail the World War II sites in and around Saipan.

Site-Specific Investigations

As a result of the four surveys, over 50 sites were identified within the scope of this study. The majority of these were represented by post-World War II wreckage from nonshipwreck sites. Many of the remains were in poor condition and were not considered to be significant resources. With the development of the Smiling Cove Harbor in American Memorial Park, many of these wreckage fields were removed. These sites were identified and described in the American Memorial Park Submerged Cultural Assessment (Miculka and Manibusan 1983).

Four shipwreck sites associated with either the interwar years or World War II are discussed here. Two are located within the boundary of American Memorial Park; the remainder

are within Saipan Lagoon. None of the sites has an official site designation number, and they are referred to by their investigation number from either the 1983 or the 1984 survey (Figures 9.1 and 9.2, respectively).

Site Number 1: Japanese Tugboat

A small Japanese tugboat was relocated during the 1983 survey of American Memorial Park (Figure 9.1). Previously examined in 1980 during a survey for the Corps of Engineers, the site was identified by Michael R. Thomas and Samuel T. Price (Thomas and Price 1980). According to their report, the tug was used during the 1930s. During the 1983 survey, approximately 15 feet of the boat protruded above the water surface. The ship was in very poor condition with only the midsection remaining. Not enough of the site remained to make a positive identification. The wreck measured 52 feet long and 15 feet wide and was in 5 feet of water. The site was destroyed in 1990 to widen the channel to Smiling Cove Marina within the park.

Site Numbers 25 and 26: Unidentified Small Boat

Two sections of wreckage, possibly from the same boat, were discovered during the 1983 survey. Site number 25 (refer to Figure 9.1) is the stern section and prop of a boat. It measured 15 feet long and 8 feet wide. A bow section, number 26 on the 1983 base map, was 20 feet long by 12 feet wide. The present status of these remains is unknown.

Two other sites are located within Saipan Lagoon. They were first examined in 1984 and again in 1990.

Unidentified Japanese Freighter

The remains of a small World War II freighter sunk in Saipan Lagoon (refer to Figure 9.2) were first examined by NPS divers in 1984. The disarticulated remains lie in 35 feet of water on a sandy bottom (Figure 9.3). Very little of the ship is intact except for a small section of the bow. A section of the wreckage contains the remains of a boiler (Figure 9.4). The overall length of the wreckage is about 348 feet, but it is scattered over an area of 900 feet.

Nearly two dozen merchant vessels (trawlers, whalers, etc.) were sunk in or around Saipan during World War II. Commissioned during the war years, they served as auxiliary submarine chasers, guard boats and transports. Of these, two were small steam whalers, KYO MARU No. 8 and KYO MARU No. 10, both built in 1938 and reported to have been sunk at Saipan on February 23, 1944. The presence of a steam boiler on Site Number 1 may indicate that this is the remains of one

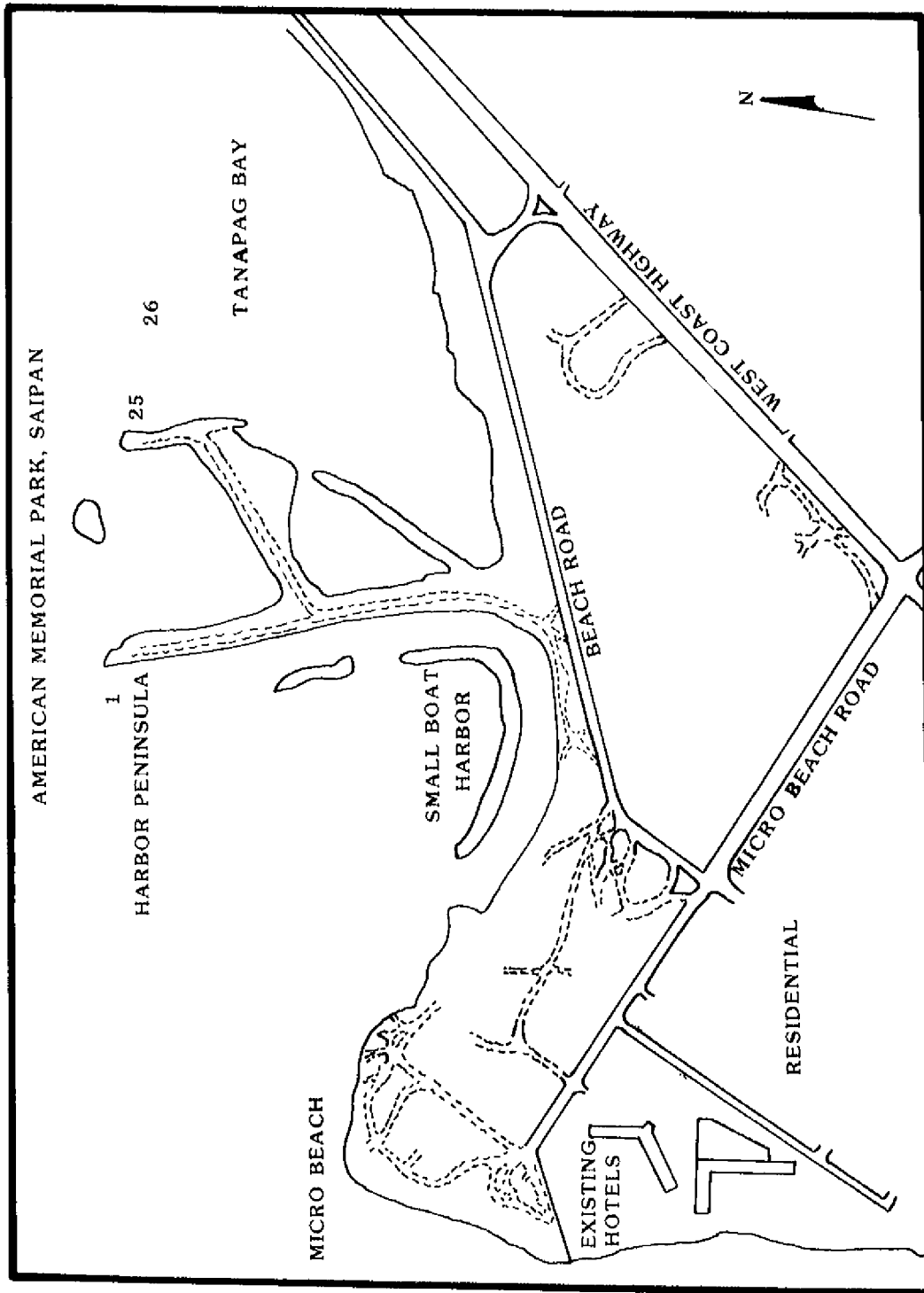


Fig. 9.1. Location of Japanese tubgoat and unidentified remains of a small boat discovered during a survey of American Memorial Park, October 1983.

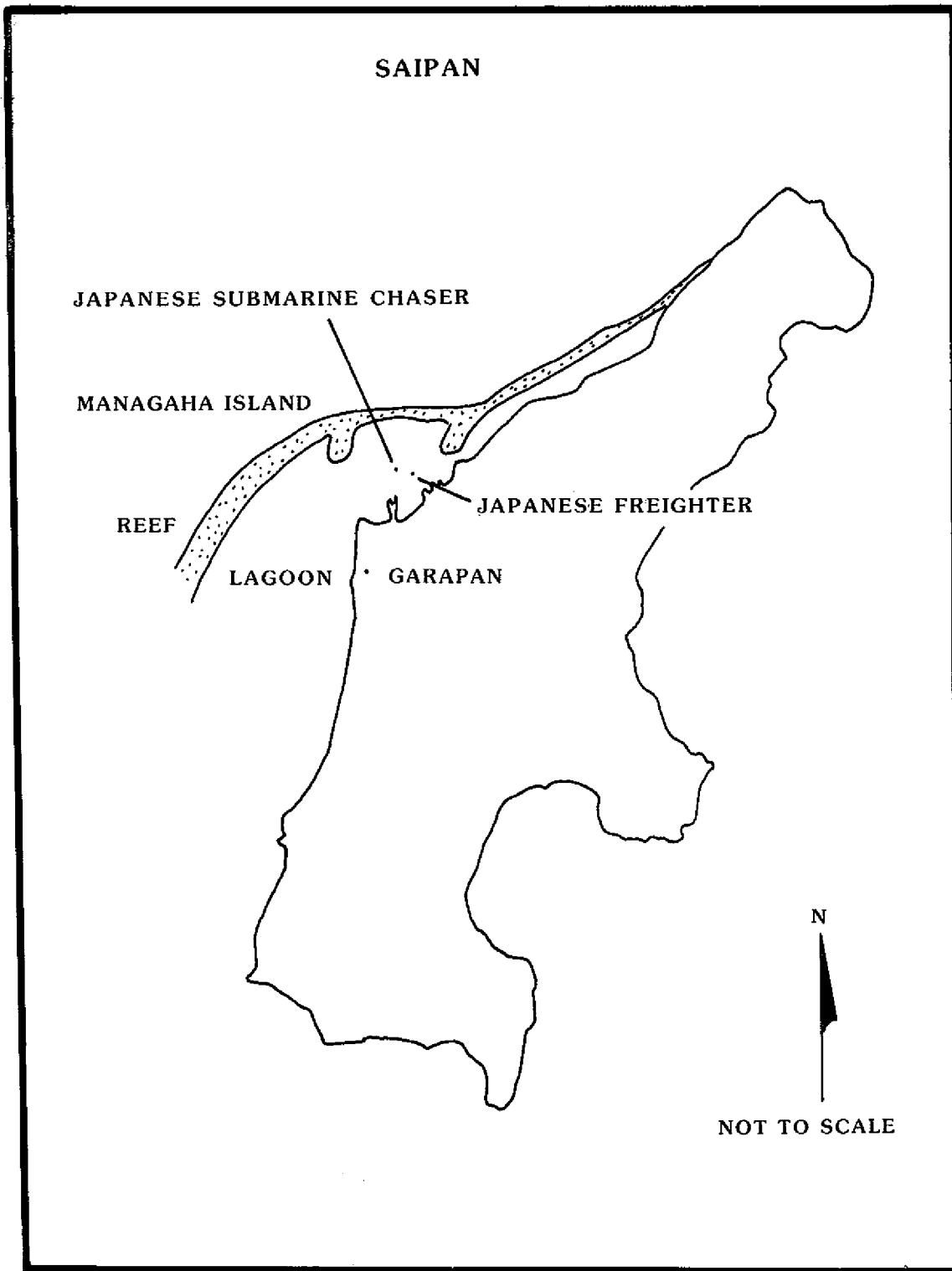


Fig. 9.2. Base map of shipwreck sites identified during a 1984 survey of Saipan Lagoon.



Fig. 9.3. The disarticulated remains of a small Japanese freighter are scattered over a wide area in Saipan Lagoon. (Photo by William Cooper)

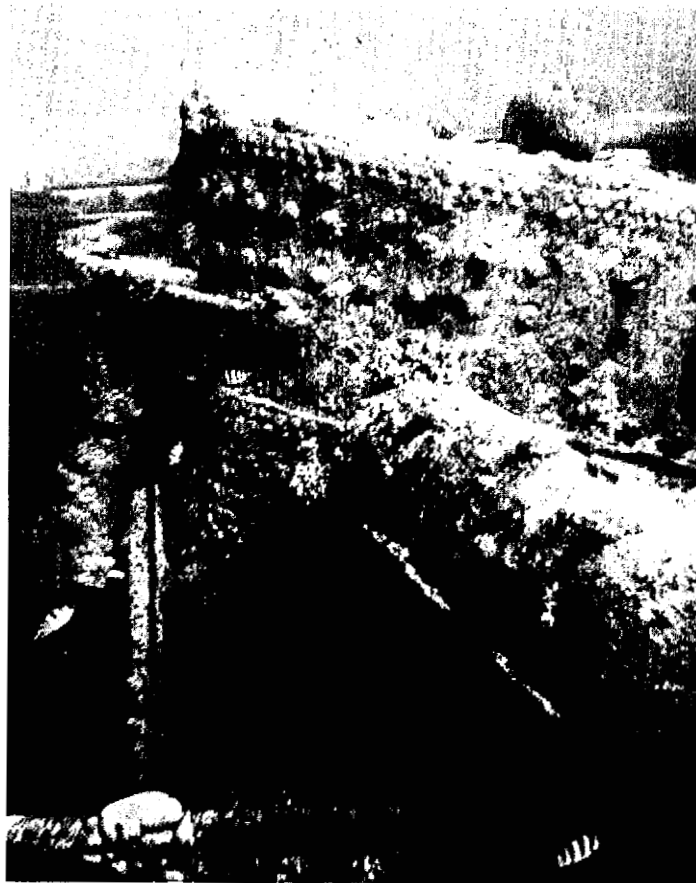


Fig. 9.4. An upended boiler from a Japanese freighter sunk during World War II. (NPS photo)

of the two whalers. This site was also tentatively identified by Jim Brandt in 1990 as the SHOAN MARU. Without additional information, however, this is simply a working hypothesis upon which to base additional research on the site.

Japanese Submarine Chaser

This site, located in Saipan Lagoon (refer to Figure 9.2), was identified by tour operators as a submarine. After the 1990 survey, however, the site is believed to be a Japanese submarine chaser. The overall length of the site is about 142 feet. Only about 42 feet of the ship remain intact, the bow section (Figure 9.5). The beam at the rear of the bow section is about 13 feet long. The rest of the ship is in many fragments (Figure 9.6).

Administrative Status

The American Memorial Park is administered by the U.S. NPS. However, the Commonwealth of Northern Mariana Islands (CNMI) can request the park back at any time. The area of Saipan Lagoon is administered by the commonwealth.

Present Threats and Impacts

The developing tourism operations of the CNMI could cause heavy visitation to these sites by scuba divers. There is already a commercial tour submarine on Saipan that offers tours of some underwater sites. There have been reports of this tour submarine damaging some of the sites.

Rota

National Park Service Submerged Cultural Resources Unit archeologist, Toni Carrell, and diving technician, Ken Vrana, visited the island in 1987 at the suggestion of Mark Michael, owner of Dive Rota. Michael, representing the Governor of Rota at a submerged cultural resources training workshop held on Guam, requested assistance in identifying submerged cultural resources located in Sasanhaya Bay. Since the NPS visit, Michael has continued to document the remains of submerged sites around the island.



Fig. 9.5. Bow of possible Japanese submarine chaser sunk in Saipan Lagoon. (Photo by William Cooper)



Fig. 9.6. The disarticulated and scattered remains of a Japanese ship, possibly a submarine chaser, sunk in Saipan. (Photo by Tim Rock)

Site-Specific Investigations³

The known shipwreck sites on Rota span nearly four centuries. The earliest documented wreck is that of SANTA MARGARITA, a manila galleon lost in 1601 somewhere just offshore of the island. Four ships are reported to have been lost in the vicinity of Rota during the Spanish colonial period, from 1746 to 1812. Historical research identified two Japanese World War II merchant ships, SHOUN MARU and SHOTOKU MARU, as lost at Rota. Along with the merchantmen, two auxiliary submarine chasers, CHA 54 and CHA 56, are also confirmed losses. A more modern wreck of a wooden-hulled, twin-engined boat is also known to have been wrecked here. Two other World War II ships, a gunboat and a steam transport, were lost in deep water near the island. Of the resources known to be at Rota, SHOUN MARU, CHA 54, CHA 56 and an as yet unidentified submarine chaser were investigated.

SHOUN MARU

This World War II Japanese merchant ship is lying on the bottom of Sasanhaya Bay on the western end of Rota (Figure 9.7).

Historical Background

No specific documentation has come to light on the operational background or historic description of this ship. SHOUN MARU is referenced in Jentschura, Jung and Mickel only as a transport of 4,396 gross registered tons (1977:279). A Japanese visitor to Rota, who claims to have been on the island during the war, told Mark Michael that the ship was built in Kobe, Japan, by the Matsuoka-Kisen Company (personal communication). This informant also spelled the name of the ship as SYOUN-MARU. Based upon the archeological remains, it appears that SHOUN MARU may have been built generally along the lines of the old freighters (Figure 9.8), as identified in ONI 208-J (Department of the Navy 1942).

SHOUN MARU, a bulk cargo freighter used in the transport of phosphate ore, was anchored just offshore in late June 1944. Only a week earlier the U.S. had initiated the invasion of

³This section on the shipwrecks on Rota was written by Toni Carrell based upon information gathered in 1987 by Carrell, Vrana, and Mark and Lynne Michael and subsequent investigations by Mark and Lynne Michael and Mark Gunderson in 1989 and 1990.

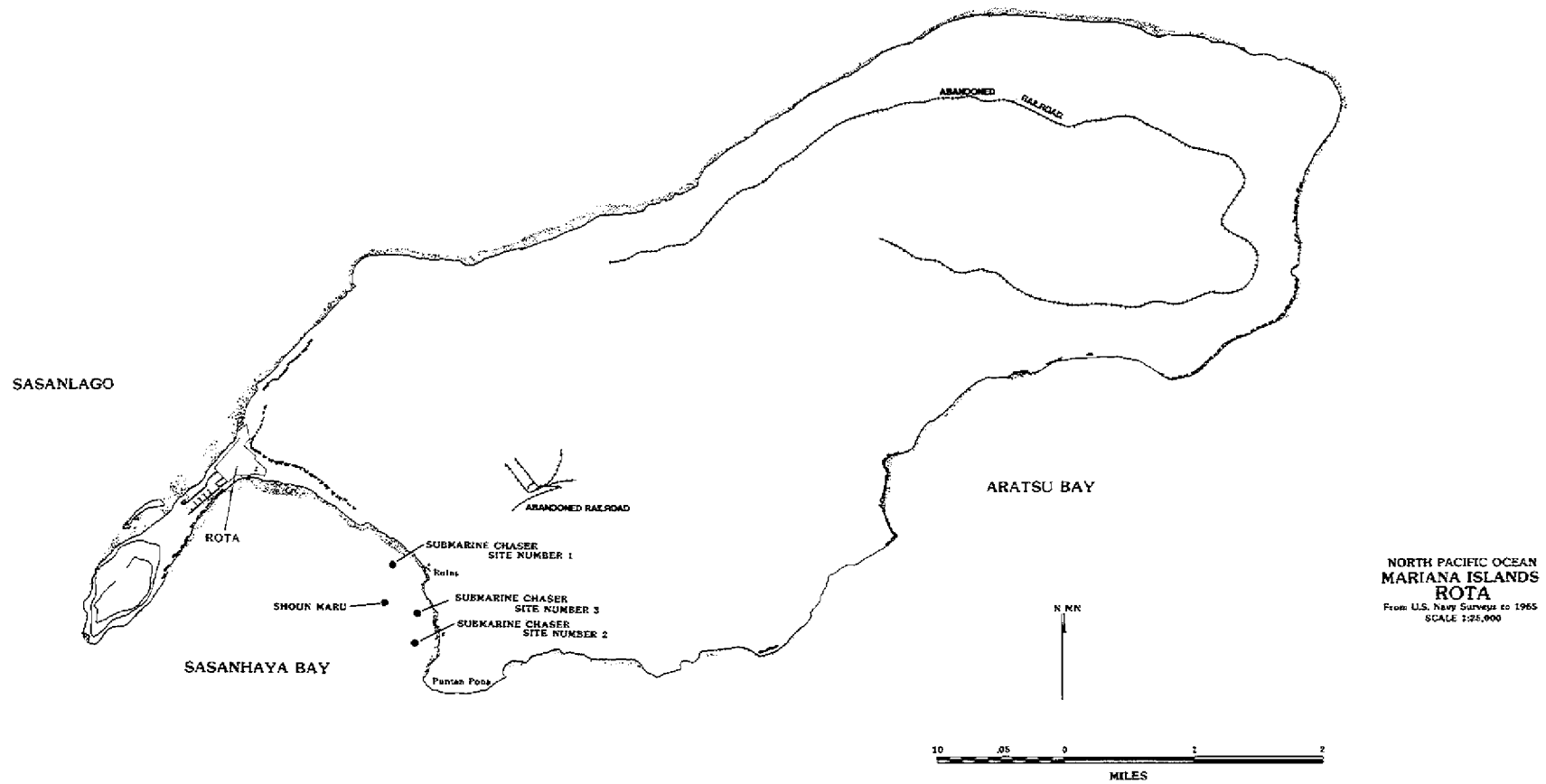


Fig. 9.7. Base map of documented shipwreck sites in Sasanhaya Bay, Rota.

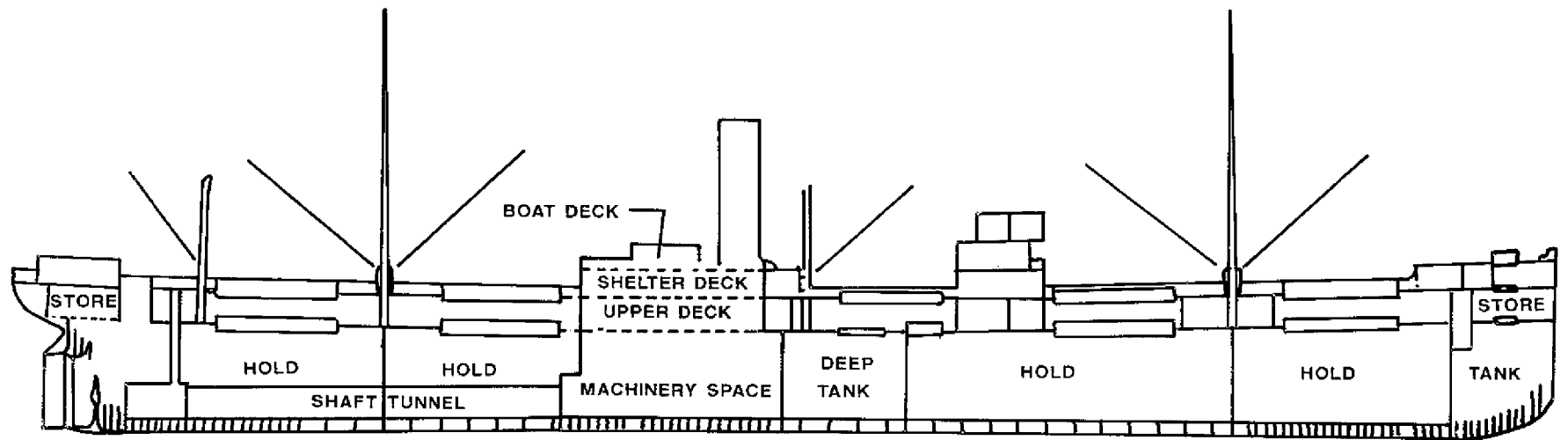


Fig. 9.8. Typical interior profile of Japanese "old freighter." (ONI 208-J)

Saipan, and two submarine chasers, anchored in the same bay, had been sunk. In a precarious position and probably without armed escort, SHOUN MARU was riding at anchor when it was attacked and sunk by a torpedo bomb on June 23 or 24 (Figures 9.9 and 9.10). Bombers, deployed from U.S. Task Force 58, were actively seeking targets throughout the islands during raids associated with the invasion of Saipan and preinvasion attacks on Guam.

Present Description and Analysis

The vessel sits upright in 70 to 110 feet of water on a white sand bottom. The longitudinal axis of the ship is nearly due east and west at 260 degrees. A mooring buoy is attached to the windlass in the bow, which, like the stern, is substantially intact (Figures 9.11 and 9.12). The approximate length of the ship at the level of the main deck is 393 feet. Sometime in the late 1950s or early 1960s, salvage activities were undertaken, reportedly by Jim Tolan, a long-time Guam resident and commercial scrap metal salvor. The forward holds were dynamited open as part of this salvage effort.

The vessel is intact from the stem aft to the first cargo hold. Three decks are present in the bow (Figure 9.13). The chain locker is intact, although a portion of the main deck has fallen in. Another compartment contains lanterns, and paint cans are on the shelves in the paint locker. A ventilator stack, rigging, a variety of cable shackles and numerous gas cylinders are also present in the bow. Truck frames, the cab of one truck and five bicycle frames are present on the second deck (Mark Michael personal communication).

The port and starboard sides are blown out from the first cargo hold aft to the machinery space (Figure 9.14). Two scotch marine boilers and the triple expansion engine are sitting upright in their original locations (Figure 9.15). Breaching for the boilers is partially damaged, and a portion of the stack lies to port of the engine. No clear evidence of the upper deck works was observed, although additional examination of the various pieces of sheet wreckage scattered about would likely result in identification of this feature.

Aft of the machinery space, the sides are bowed out, either from the dynamiting or from the bombing attack. The aft cargo space is reasonably intact up to the level of the main deck. Several truck frames and a small ore cart are present. A motorcycle remains in the No. 4 cargo hold (Figure 9.16).

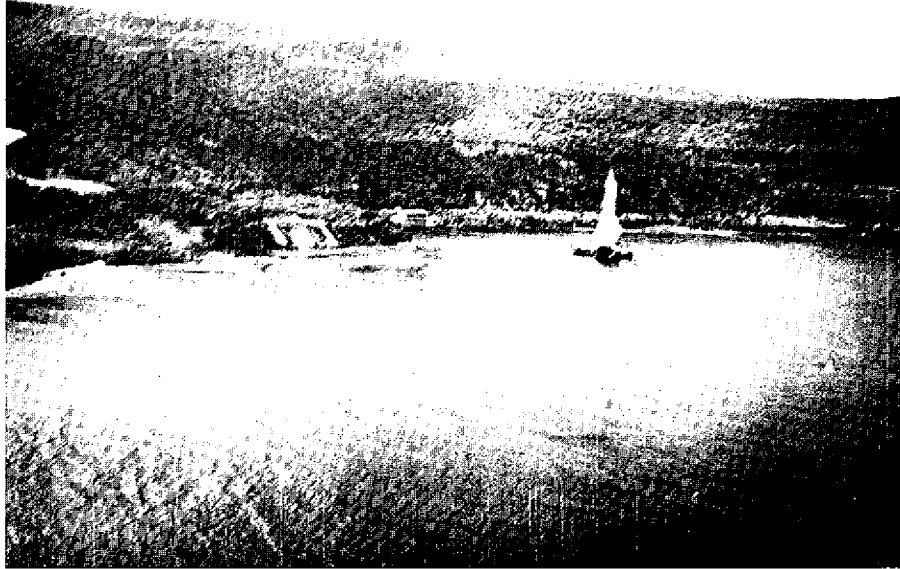


Fig. 9.9. SHOUN MARU was a bulk cargo transport used to carry phosphate ore to Japan. The trail of a torpedo can still be seen in the water at the moment of impact. (Photo courtesy of National Archives)



Fig. 9.10. Severely damaged by aircraft from Task Force 58, SHOUN MARU is shown burning and sinking in Sasanhaya Bay, Rota. (Photo courtesy of National Archives)



Fig. 9.11. View athwartships at bow from port side of SHOUN MARU. (Photo by Mark Michael)



Fig. 9.12. View toward the stern of SHOUN MARU from hold Number 3. (Photo by Tim Rock)

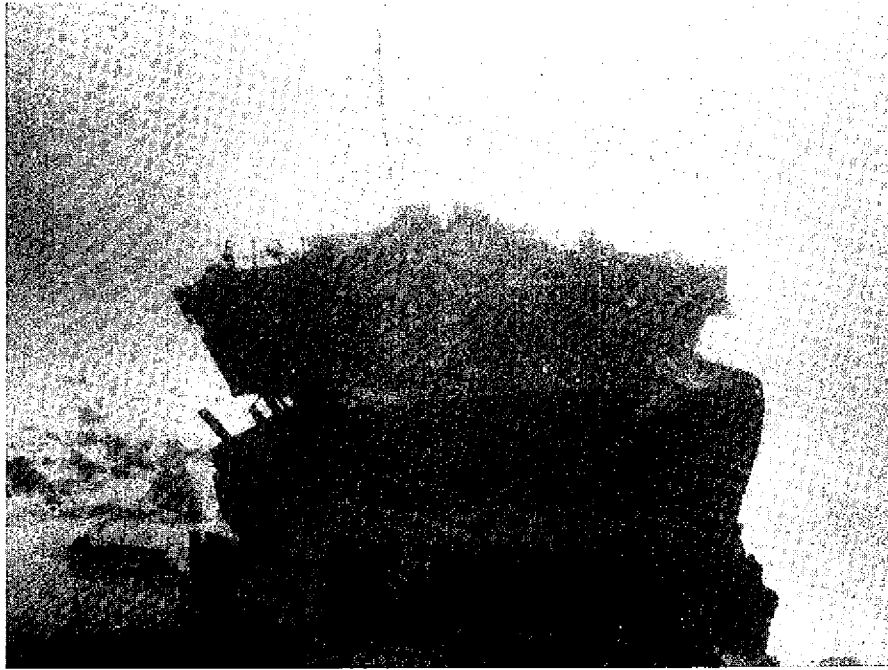


Fig. 9.13. SHOUN MARU's bow is intact from the stem aft to the first cargo hold, and three decks, up to the spar, are present. (Photo by Mark Michael)

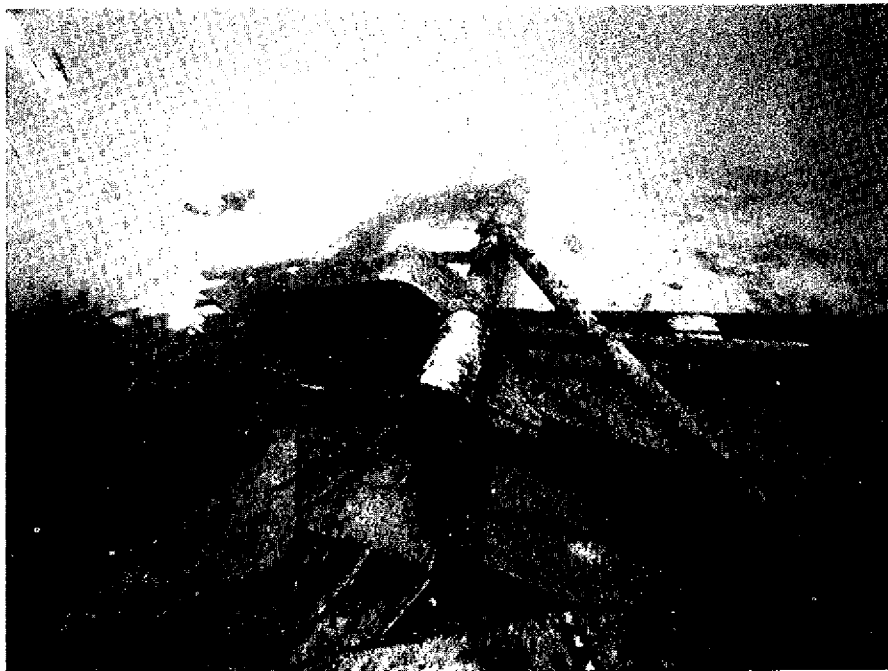


Fig. 9.14. The port and starboard sides are blown out from the first cargo hold aft to the machinery space. One of SHOUN MARU's kingpost masts lies on the bottom. (Photo by Tim Rock)

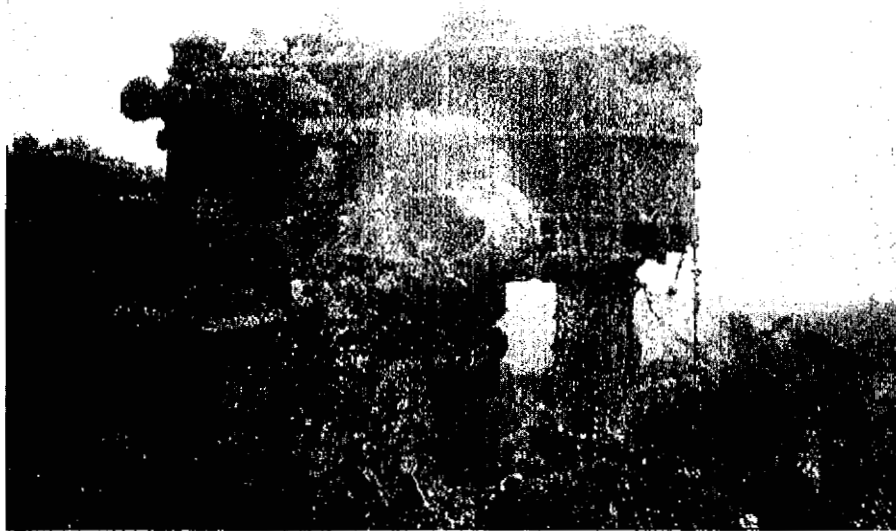


Fig. 9.15. SHOUN MARU's triple-expansion steam engine sits upright in its original location. (Photo by Mark Michael)

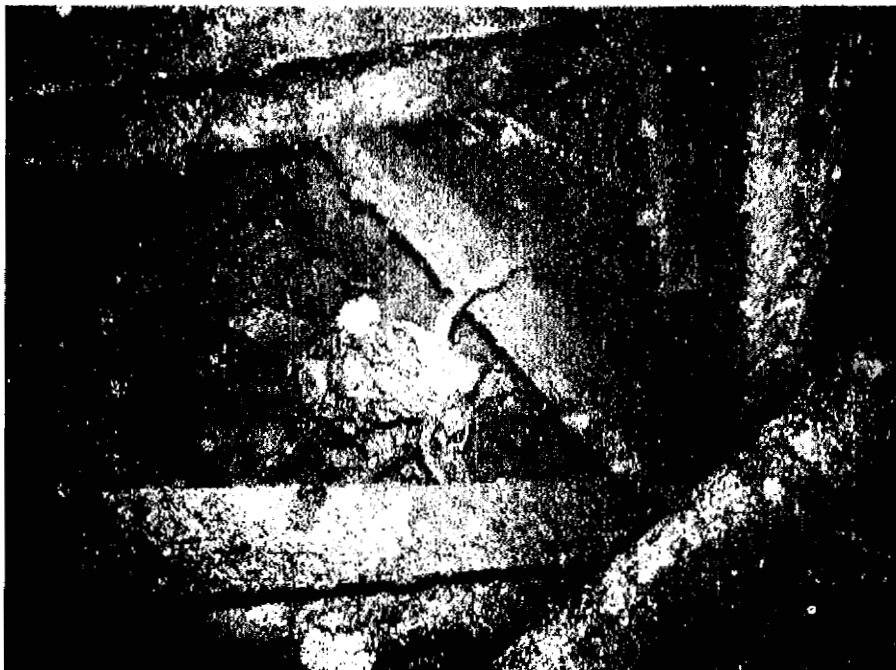


Fig. 9.16. Japanese motorcycle in Number 4 cargo hold. (Photo by Mark Michael)

The stern is in good condition and nearly intact. A cargo winch and a capstan are present and in their original locations, although a portion of the deck has collapsed onto the capstan. A row of portholes, still in place, is present along the port side of the aft compartment (Figure 9.17). The propeller was salvaged in the past; however, the rudder is in place below its counter stern (Figure 9.18). Scattered throughout the ship is a wide variety of small artifacts, including sake bottles, shell casings and helmets. One of three bathtubs located on the ship is in the stern in what may have been a berthing area. Another is on the deck, while the third is lying on the sand bottom on port side, approximately amidships.

The remains of the ship's kingpost-style cargo masts are lying among the wreckage.

Japanese Auxiliary Submarine Chasers

The remains of three auxiliary submarine chasers lie on the bottom of Sasanhaya Bay (refer to Figure 9.7).

Historical Background

Documents provide information on two submarine chasers that were sunk here, CHA 54 and CHA 56 (Jentschura, Jung and Mickel 1977:218); no historical evidence has come to light to help in the identification of the third.

Constructed during the 1941-1943 war programs, the auxiliary submarine chasers were based upon the design of the experimental tugs, EISEN No. 1182 and No. 1183. Intended for use as fishing vessels, after the war, these wooden-hulled boats were built by 1 of 16 commercial shipyards that specialized in fishing craft.

Generally referred to as the CHA 1 Class, these boats were 85 feet, 4 inches long at the water line and had a beam 18 feet, 4 inches long (Figure 9.19). The pilothouse was located amidships, and both the bridge and engine room were protected by 4-mm armor plate. They were powered by 400 standard horsepower diesel engines with a single shaft. Carrying a complement of up to 23, these chasers were equipped with one 7.7-mm machine gun forward of the bridge, at least 2 depth-charge launchers, and 22 depth charges. Each was armed and equipped by the naval dockyards at Yokosuka, Kure, Maisuru or Sasebo.

Auxiliary CHA 54 was attacked and sunk on June 15, 1944, and CHA 56 was sunk two days later on June 17. Both were the victims of bombing attacks from Task Force 58. Until identified in 1987, both sites were believed to be the

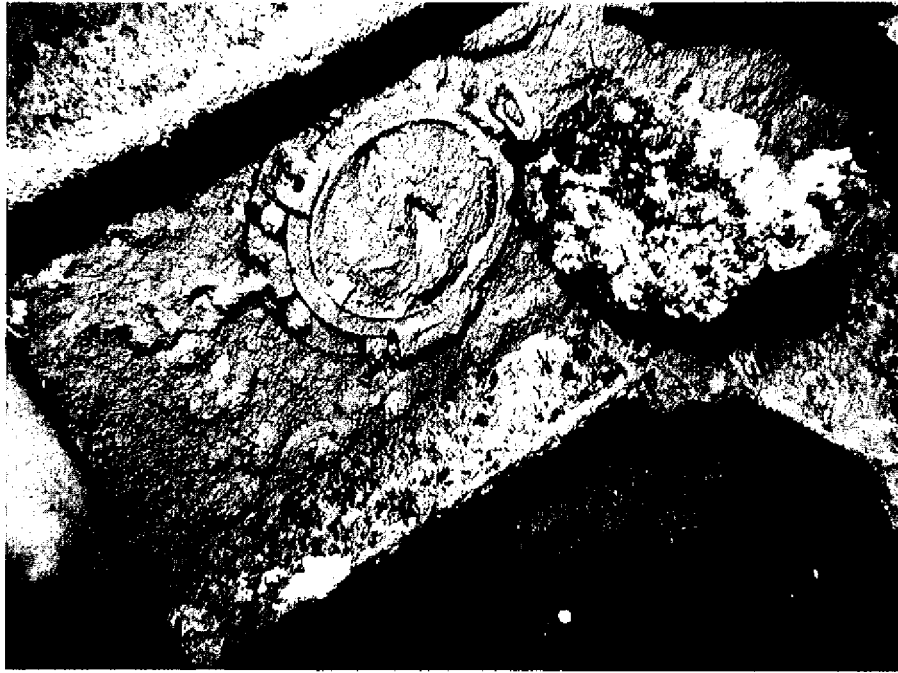


Fig. 9.17. Portholes are still intact in a stern compartment on SHOUN MARU. (Photo by Mark Michael)



Fig. 9.18. The counter stern is intact, but the propeller on SHOUN MARU was salvaged. (Photo by Mark Michael)

remains of fishing boats. Their condition is such that it was not possible to determine which site was which specific chaser. In the following discussion they are referred to only as auxiliary submarine chaser sites Numbers 1, 2 and 3.

Present Description and Analysis

Auxiliary submarine chaser site Number 1 is located in 50 feet of water at a popular dive site locally referred to as Cable Run (refer to Figure 9.7). Wreckage is scattered in an area approximately 400 feet in diameter and lies among a coral reef that has grown over much of the boat.

The ship's diesel engine is lying about 90 yards offshore on its port side (Figure 9.20). The engine appears to be intact with little or no damage to the block or generator mounted on its top. The engine mount is 16 feet, 11 inches, overall (5 meters, 15 centimeters). Approximately 40-50 feet from the engine, the shaft and screw lie on the sand. The intact shaft, along with two of its mounts, is constructed in two sections, 12 feet, 6 inches long and 8 feet, 3 inches long, respectively. Overall, the length including couplings is 22 feet, 11 inches (6 meters, 60 centimeters). The 14-inch, three-blade propellers remain on the shaft, with two blades buried in the sand. The remains of two gas cylinders, approximately 8 feet, 4 inches long (2 meters, 50 centimeters), lie nearby (Figure 9.21). High-pressure air cylinders were used to help start diesel engines and are a good indicator of the type of engine used. The remains of the engine room skylight are also in the vicinity of the shaft and cylinders. Approximately 20 feet away, the remains of what may be a radio were discovered (Figure 9.22).

In addition to the principal features, the remains of an anchor winch, with link chain running through it, and a capstan are present. Bits of the wooden deck are visible on the capstan base. The ship's port anchor is easily located by following the played-out anchor chain. According to Mark Michael, owner of Dive Rota, the starboard anchor was removed from the site in 1987. At the time of its removal, it too was attached to the anchor chain. That anchor is presently being used to anchor a mooring buoy in East Harbor. The ship's spare kedge anchor, measuring 4 feet, 10 inches from base to the ring, is on the site (Figure 9.23).

Miscellaneous pieces of sheet metal, possibly the armor plate from the engine room and bridge, are scattered among the corals on the site. Small arms ammunition, most likely for the 7.7-mm antiaircraft machine gun (Figure 9.24); a portion of the depth-charge launchers; and seven depth charges have been identified on the site as well.

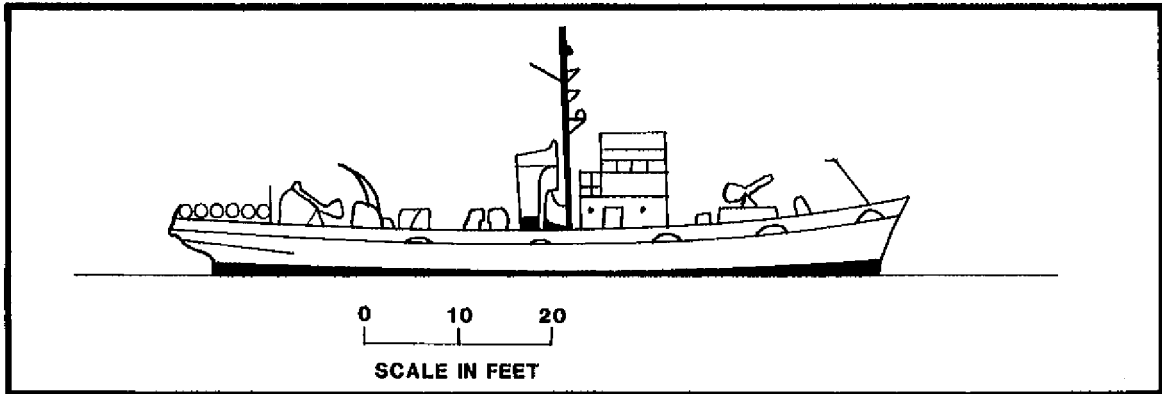


Fig. 9.19. Illustration of the auxiliary submarine chasers of the CHA 1 Class lost at Rota in June 1944.



Fig. 9.20. The engine from the "cable run" auxiliary sub chaser lies on its port side in 50 feet of water. (Photo by Mark Michael)

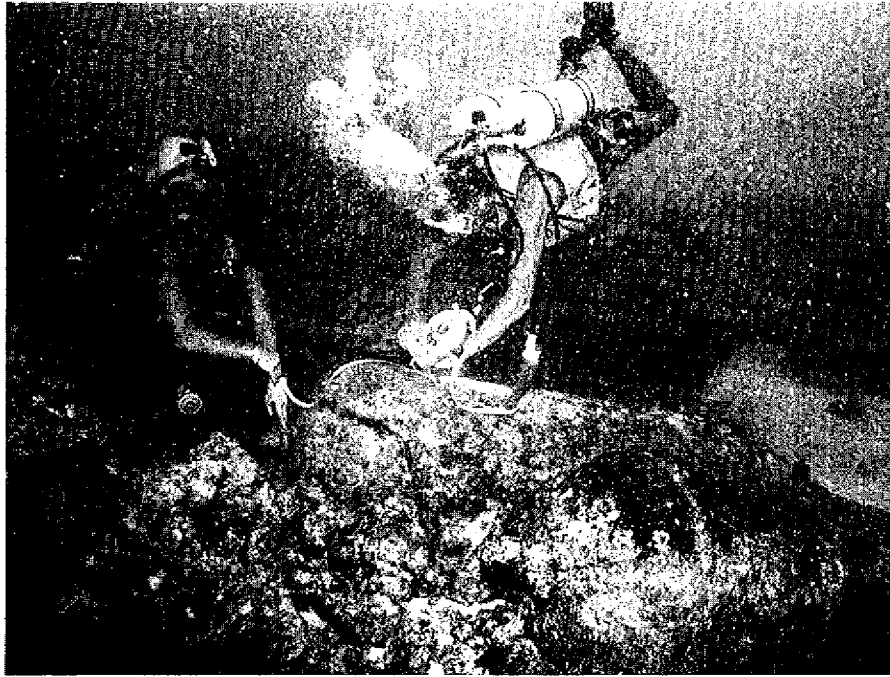


Fig. 9.21. High-pressure air cylinders being measured by volunteer divers documenting the wreckage of submarine chaser site Number 1 near Cable Run. (Photo by Mark Michael)

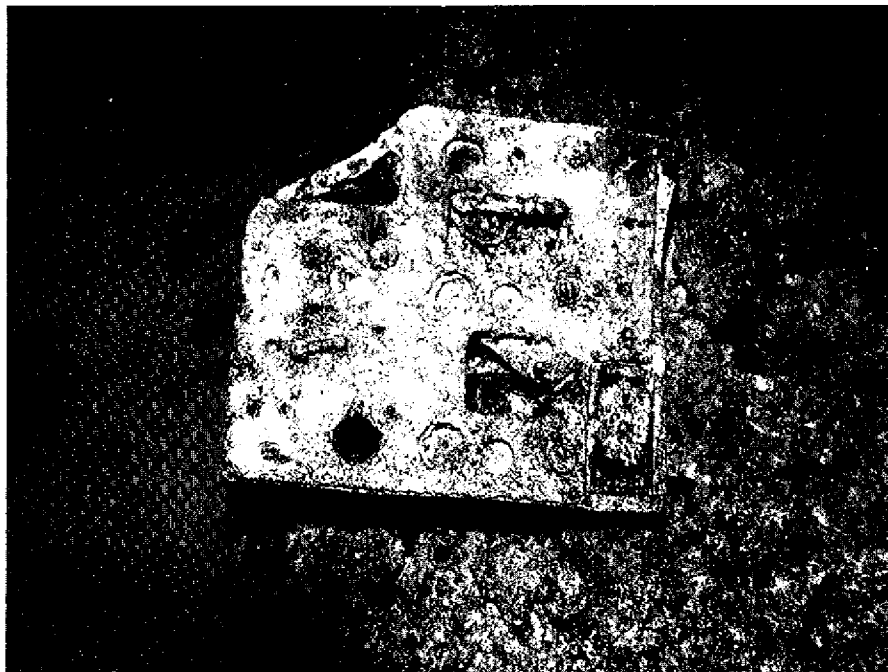


Fig. 9.22. The remains of what appears to be a radio lie on the coral reef. (Photo by Mark Michael)

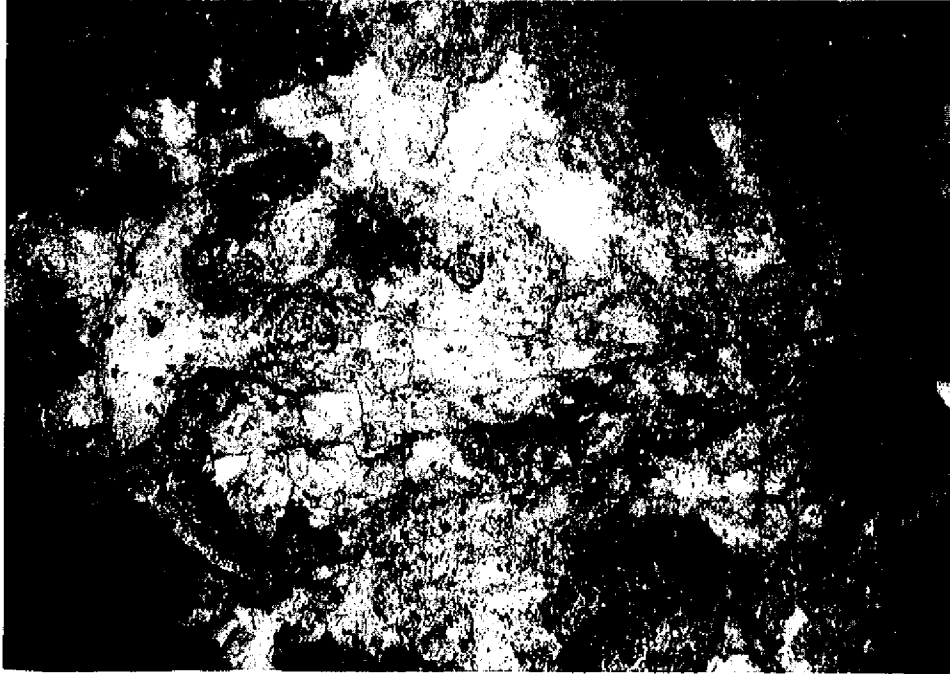


Fig. 9.23. Spare kedge anchor from auxiliary submarine chaser site Number 1. (Photo by Mark Michael)



Fig. 9.24. Small arms ammunition, possibly for the boat's antiaircraft machine gun, are lying near the engine. (Photo by Mark Michael)

The large area of wreckage indicates this auxiliary submarine chaser was destroyed by a tremendous explosion, most likely from a 500-pound bomb. The location and condition of the anchors, with the anchor chain played out, suggest that the boat was not underway at the time it was attacked.

Auxiliary submarine chaser site Number 2 is lying on a white sand and scattered coral bottom in 90 feet of water in an area called Coral Gardens (refer to Figure 9.7). When this site was examined in 1987, the "55-gallon drums" believed to be from a fishing boat were identified as depth charges, and the site type was confirmed (Figure 9.25).

The wreckage is scattered over an area of approximately 300 feet in diameter. The chaser's diesel engine, identical to that found on chaser site Number 1, is sitting upright on its engine mount. The shaft and screw are intact and attached to the engine (Figure 9.26).

The remains of the bridge, stack, engine room skylight and a fuel or water tank lie to port of the engine. Forward of the engine a high-pressure air cylinder is partially buried; slightly to port the anchor windlass and anchor chain are present. Nearby, the remains of the wooden hull framing are exposed in the sand (Figure 9.27) along with a cleat attached to a portion of the rail.

The base and pedestal for the chaser's 7.7-mm antiaircraft machine gun sit upright on the sand bottom forward of the engine (Figure 9.28). Numerous depth charges are scattered among the corals to the port of the engine. In addition to the major features, the ship's binnacle (Figure 9.29) has been identified as well as the running lights (Figure 9.30). A brass offering bowl, the remains of a shoe or boot, sake bottles, the depth-charge launcher, engine room grating and a variety of other miscellaneous debris have all been discovered at this site. Because of the extensive remains, this site is an excellent "bench mark" with which to compare the remains of the many other CHA 1 Class auxiliary submarine chasers that are lost throughout Micronesia.

Auxiliary submarine chaser site Number 3 was located in late 1989 by Mark and Lynne Michael. It is lying on the sea floor below "the second Japanese gun emplacement" (Mark Michael personal communication), which is located on the road that encircles the island (refer to Figure 9.7). Identification of this site as a CHA 1 Class submarine chaser was based upon comparison of features found here with those found at Cable Run and Coral Gardens.

The wreckage is scattered across an area of approximately 500 feet in diameter and lies in 30 to 90 feet of water. Much of



Fig. 9.25. Depth charges found on the auxiliary submarine chasers in Rota. (Photo by Mark Michael)



Fig. 9.26. The diesel engine from auxiliary submarine chaser site Number 2 at Coral Gardens sits upright with its shaft still attached. Note the fuel tank beyond the diver. (Photo by Tim Rock)



Fig. 9.27. Remains of the wooden hull framing are exposed on the starboard side in the bow and in the stern. (Photo by Mark Michael)

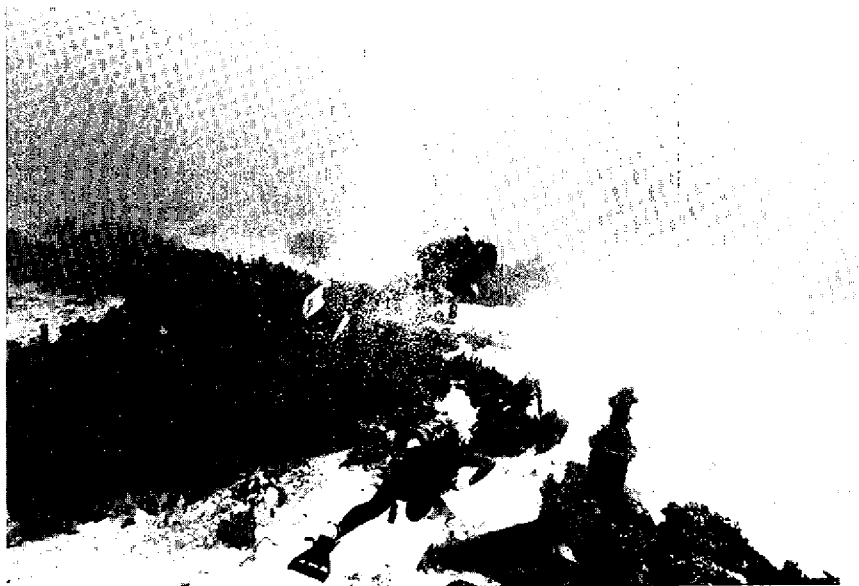


Fig. 9.28. The anti-aircraft machine gun base and pedestal are present on the Coral Gardens site (located lower right). Framing is visible sticking out of the sand (middle right). (Photo by Tim Rock)



Fig. 9.29. The binnacle is heavily encrusted but still recognizable. (Photo by Mark Michael)



Fig. 9.30. A diver examines the running light from the Coral Garden submarine chaser. (Photo by Mark Michael)

the debris field is in the reef and is heavily overgrown. The boat's diesel engine, identical to those found on the other two chasers, is lying on its port side. Other remains include the propeller and shaft, anchor, high-pressure air cylinder, ladder, cleat and rail, and bullets. In addition, several brass discs found on the valve wheels of the air cylinders were identified by a Japanese visitor. These discs are identical to those found on the Cable Run site.

The depth charges and depth-charge launcher are identical to those found on the other sites (Figure 9.31). A plate from a depth-sounding machine was also identified by a Japanese visitor (Michael, personal communication).

A section of the ship's planking, partially buried in the sand, was discovered in an area some distance from the main concentration of wreckage (Figure 9.32). In addition, a brass fire extinguisher and a hatch cover have been located (Figures 9.33 and 9.34).

Although no historical documentation has come to light to corroborate the site Number 3 as a CHA 1 Class, the archeological record leaves little doubt about its identity.

Administrative Status

All of the sites in and around Rota are administered by the local government and are under the umbrella of the historic preservation law of the Commonwealth of the Northern Mariana Islands.

Present Threats/Impacts

Sport diving is a popular activity on Rota. At present there is little effective control over the removal of artifacts from sites. The local dive shop owners, Mark and Lynne Michael, do not encourage divers to remove artifacts and have made strong efforts to record the location and photograph artifacts from submerged sites around the island.

Guam

The more than 60 documented shipwrecks in and around Guam span a period of more than four centuries. The earliest is the manila galleon SAN PABLO, sunk at anchor when a typhoon struck in 1568. Ships representing every period in Guam's history: the Spanish colonial period, whaling, American colonialism, World Wars I and II, and up to the modern era are known to have been wrecked here. Not surprisingly, the galleons have been the target of treasure companies in efforts to obtain salvage rights; to date no galleons have



Fig. 9.31. Depth charge found on the recently discovered auxiliary submarine chaser site Number 3 in Rota. (Photo by Mark Michael)



Fig. 9.32. Planking partially buried in the sand was discovered some distance away from the main wreckage field. (Photo by Mark Michael)



Fig. 9.33. A diver holds up the brass fire extinguisher found on the third auxiliary submarine chaser site. (Photo by Mark Michael)

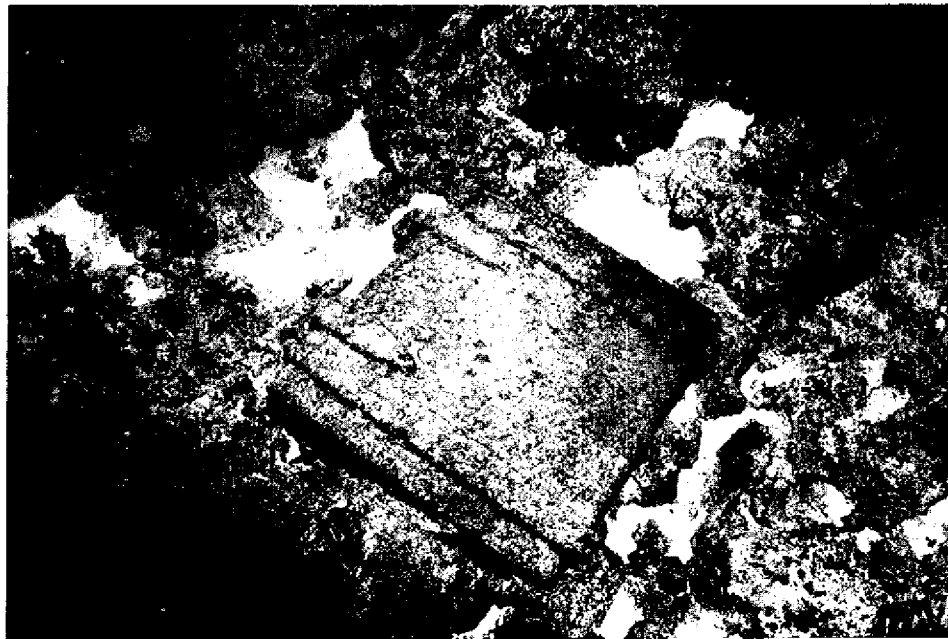


Fig. 9.34. A small hatch cover from submarine chaser site Number 3. (Photo by Mark Michael)

been excavated on Guam. Various others have been the subject of scholarly document research (Corey 1971; Driver 1976; and others).

Only five ships from the twentieth century have been the focus of underwater archeological investigation. Interest in the wrecks has stemmed from their association with World Wars I and II, their accessibility to scuba divers and their relative integrity. They are CORMORAN from World War I; KITSUGAWA MARU, TOKAI MARU and NICHYU MARU lost in Apra Harbor (Figure 9.35), and ARATAMA MARU sunk in Talafofo Bay (refer to Figure 9.56), all from World War II.

Site-Specific Investigations

SMS CORMORAN⁴

In 1978 the Department of Parks and Recreation conducted a preliminary survey of CORMORAN. In 1983 while on Guam to survey the offshore areas of WAPA for historic features, the SCRUI completed a video and photographic survey and an artist's perspective drawing of CORMORAN and the adjacent TOKAI MARU (Figure 9.36). During the summer of 1988, the SCRUI and the WAPA submerged-resources team began detailed mapping of SMS CORMORAN and TOKAI MARU. In 1988 the U.S. Navy placed a mooring buoy over both ships for scuba divers. Mapping documentation of the site was completed in late 1989. The German auxiliary cruiser, SMS CORMORAN, is lying on the silty bottom of Apra Harbor on the west side of Guam (refer to Figure 9.35).

Historical Background

The ship was constructed in 1909 by the German Schichau dockyards for the Russian Volunteer Fleet Association and was christened SS RJASAN. The cargo transport was captured on August 4, 1914, at the beginning of World War I by the German cruiser, SMS EMDEN, at the Straits of Tsushima. It was carrying a cargo of iron rails, wine, lemons, salt meat, black Russian tea, and a few passengers on a voyage from Shanghai and Nagasaki to Vladivostok. A prize crew was placed aboard, and RJASAN steamed to Tsingtao, China, a German base. RJASAN reached Tsingtao on August 6.

On August 7, 1914, the old German gunboat, CORMORAN, was decommissioned, and RJASAN was renamed SMS CORMORAN and

⁴The discussion of previous work and CORMORAN's historical background was written by David T. Lotz.

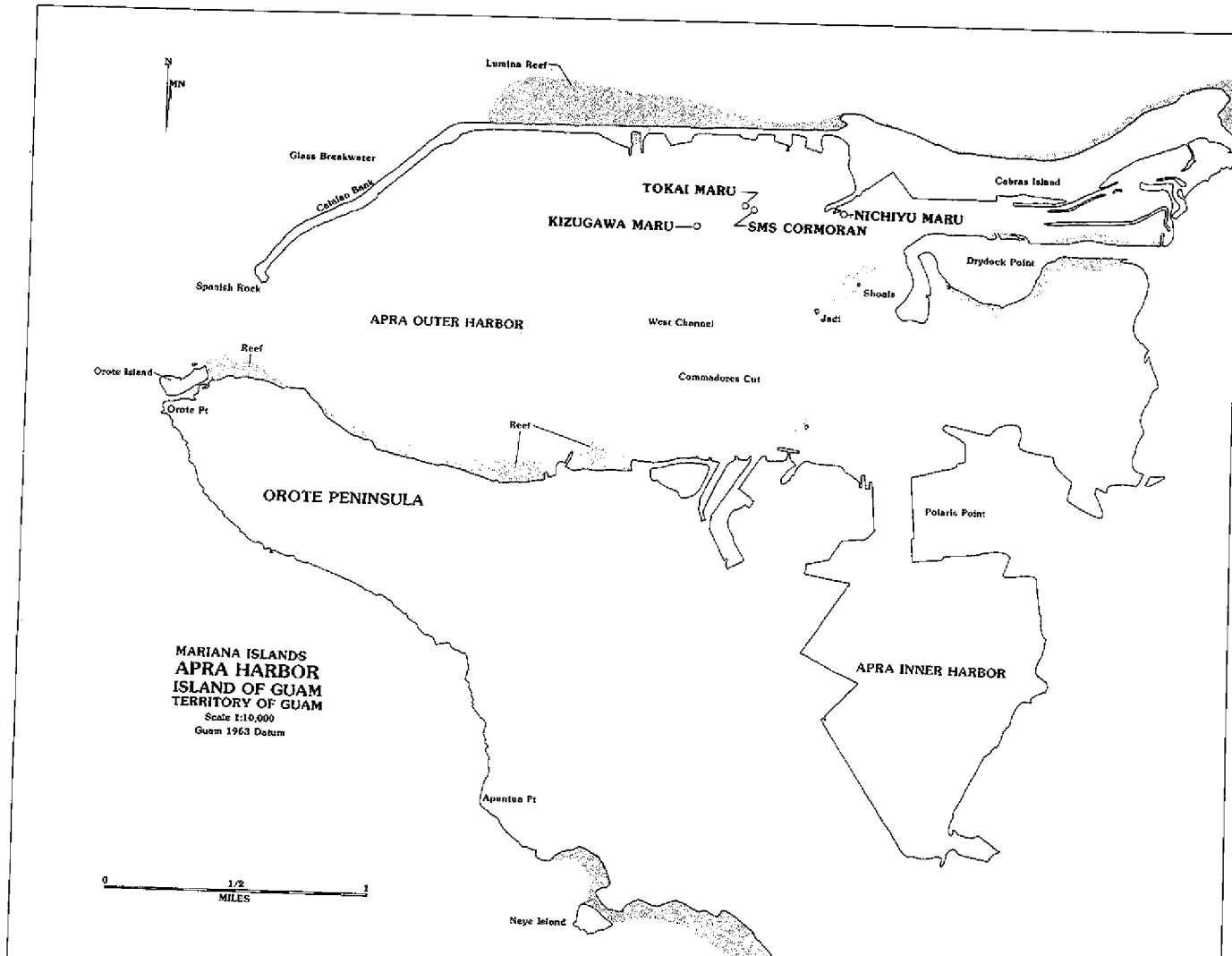


Fig. 9.35. Location of CORMORAN, KITZSGAWA MARU, TOKAI MARU and NICHYU MARU in Apra Harbor, Guam.

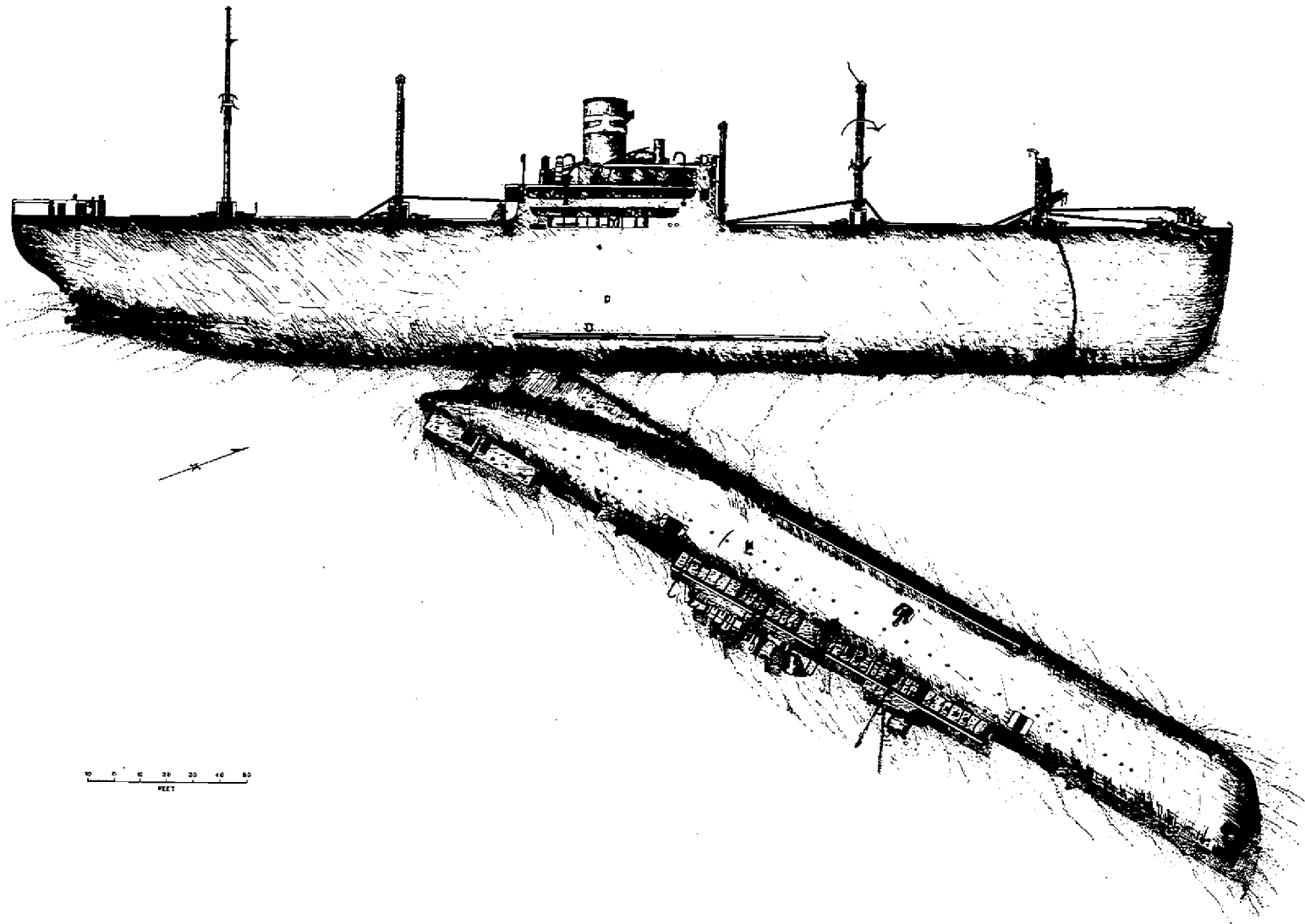


Fig. 9.36. Perspective of CORMORAN and TOKAI MARU. (Drawn by Jerry L. Livingston)

commissioned into the Imperial German Navy (Figure 9.37). Eight 10.5-cm guns were transferred from the old CORMORAN to the new CORMORAN along with stowing provisions and equipment for a crew of 15 officers, 8 petty officers, 218 enlisted men, 28 New Guinea men, and 4 Chinese under Capt. Albert Zuchscherdt for a 5-month cruise. The old CORMORAN was sunk by explosives outside Tsingtao's harbor.

CORMORAN sailed on August 10, 1914, from Tsingtao to Njelang in the Marshall Islands where, it arrived on August 21 with the rest of the German squadron arriving on August 27 under Vice Adm. Graf von Spee. CORMORAN received provisions, left the squadron, and headed southwest to wage raider warfare against merchant ships. On September 4, the cruiser reached Kavieng, New Ireland, which was still in German hands. After the Japanese declared war on Germany, they moved as quickly as possible to take control in Micronesia while hunting for German ships.

CORMORAN sailed on September 6, 1914, westward toward the Celebes, seeking a supply of coal. Finding none, it sailed to Yap. On September 17, CORMORAN reached Yap and sailed on September 19 for Alexishafen, New Guinea, where it arrived on September 23, still looking for coal. The ship escaped capture by an allied squadron and steamed toward Yap where it arrived on September 28.

On September 30, 1914, CORMORAN left Yap for Friedrich Wilhelmshafen to attack the Australians there. This plan was abandoned because of unfavorable circumstances. The cruiser sailed back to Yap on October 7, but sailed to Lamotrek Atoll when a Japanese cruiser was sighted near the entrance to the channel to Yap. CORMORAN arrived on October 12 at Lamotrek and left on December 12, headed for Guam.

CORMORAN entered Apra Harbor on December 14, 1914, with only 50 tons of coal on board. As a United States possession, Guam was neutral in 1914. Captain Zuchscherdt requested provisions from the American naval commander on the island but the request was denied. Instead, he was forced to accept interment. Interment lasted under reasonably good conditions until the United States entry into World War I on April 7, 1917.

Only two hours after President Woodrow Wilson signed the declaration of war in Washington, Lt. Owen Bartlett, USN, representing Capt. Roy C. Smith, requested the surrender of CORMORAN. Captain Zuchscherdt offered to surrender the crew but not the ship. As Lieutenant Bartlett's barge left CORMORAN at 8:03 a.m., a demolition charge was exploded to scuttle the ship as the crew abandoned ship. CORMORAN sank

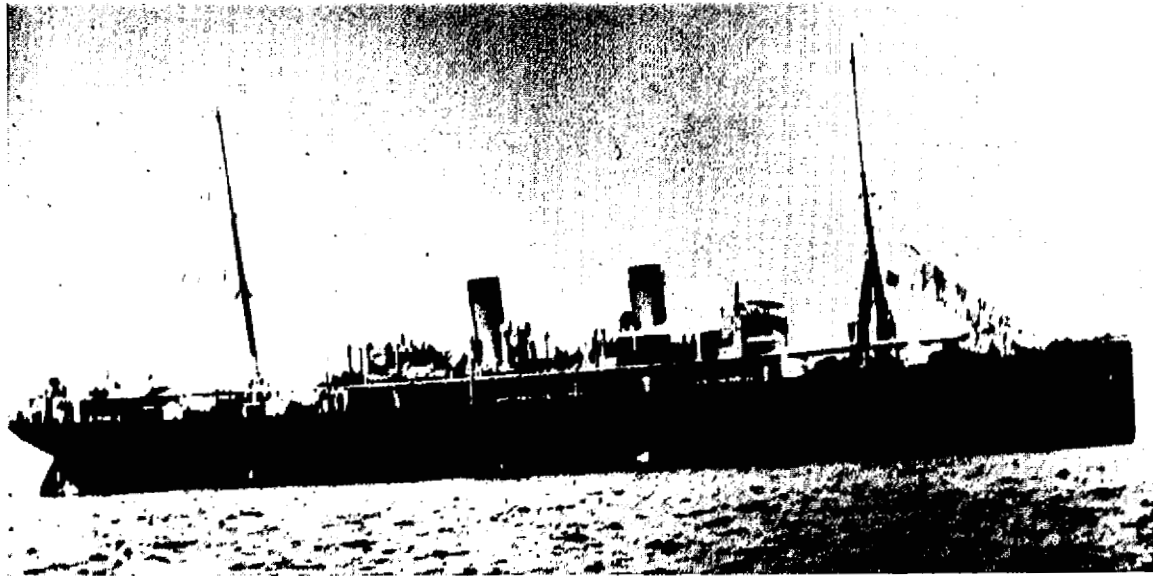


Fig. 9.37. Historic photograph of SMS CORMORAN. (Photo courtesy of GovGuam)

with a loss of seven crewmen; their remains were later recovered and buried in the Agana Naval Cemetery.

The U.S. Navy conducted salvage operations on CORMORAN in 1917 and 1918, and basically removed guns, cartridges, chain, anchors, winches, and the ship's bell.

Built as a flush-deck mail steamer with superstructure amidship and engine house aft, it is a 3,443 gross tonnage ship with a length of 334.9 feet, a beam of 45.9 feet, and a draft of 22.9 feet. It has four boilers and a triple-expansion reciprocating engine. The bow is plumb and the stern is counter. The two funnels are medium and the ventilators are cowl type. The ship had a foremast and aftermast, both of which had a topmast.

Present Description and Analysis⁵

CORMORAN lies on its starboard side in 120 feet of water (Figure 9.38). Its keel is almost touching that of TOKAI MARU with the latter on its port side bow facing almost due north. The bow of CORMORAN is facing approximately northeast. Although the propeller blades have been removed from CORMORAN, it is apparent that they must have been intact at the time of TOKAI's sinking. There are hull plates stove in on the TOKAI where it would have contacted CORMORAN's blade in sinking (Figure 9.39).

The ship's rudder is attached at the pintles but has been bent sharply and embedded in the silt. This suggests that CORMORAN hit the harbor bottom stern-first, and the weight of the ship came down using the juncture of the rudder and sternpost as a fulcrum. Because this is one of the strongest parts of the ship in construction, it bent instead of collapsing under the enormous pressure applied by the settling vessel.

There has been no major damage to the ship's hull or superstructure from the explosion or sinking, so the vessel has a generally intact appearance to the diver, the obvious exceptions being the result of sea growth and corrosion. A diver approaching CORMORAN from above will see that the lower part of the fantail disappears under the tilted port gunnel of the TOKAI, which is a large ship that has more relief from the bottom (Figure 9.40).

⁵The discussion of CORMORAN's present description and analysis was written by Daniel J. Lenihan.



Fig. 9.38. Perspective of SMS CORMORAN. (Drawn by Jerry L. Livingston)



Fig. 9.39. Dan Lenihan videotaping hole in hull plates of TOKAI MARU where it hit propeller blade of CORMORAN. Propeller hub of CORMORAN is visible but blades have been salvaged. (NPS photo by Larry Murphy)



Fig. 9.40. Fantail of CORMORAN on left of photograph passes under bilge keel of TOKAI MARU as seen on right. (NPS photo by Larry Murphy)

Moving from the stern towards the bow, the diver will see an intact cabin on the stern followed by two holds. Along the entire length of the deck the wooden decking has been eaten by marine borers and microorganisms except for small islands of wood that have been impregnated by corrosion products from the metal fittings they surround. The ship is easily penetrated at many points and has been over the years by sport divers.

There are two anchors lying on the ship approximately amidships. One lies on the lower part of the upturned port hull and the other has fallen between two davits and is lying against the superstructure at the main deck level. Some of the engine room skylights are open and others are broken.

Both of the ship's stacks are broken off and lying in the silt on the harbor bottom. This was not the case in 1983 when the NPS team first surveyed the ship (Figures 9.41 and 9.42). The ship appears to have been stripped of ground tackle and armament during the early salvage operations. None of the ship's own anchors or chain remains in place, and a long, uncontrolled, sport diving history on the site has ensured that not many portable artifacts are available for viewing without penetration (Figures 9.43 and 9.44).

TOKAI MARU⁶

In 1978 the Department of Parks and Recreation conducted a preliminary survey of TOKAI MARU. In 1983 an artist's perspective drawing was completed of the TOKAI MARU and the adjacent CORMORAN by Jerry L. Livingston of the SCRUC (refer to Figure 9.38).

TOKAI MARU was used during World War II as a transport by the Imperial Japanese Navy. It presently lies at the bottom of Apra Harbor (refer to Figure 9.35).

Historical Background

TOKAI MARU was built in the Mitsubishi Heavy Industry Shipyard in Nagasaki, Japan. Construction started on November 26, 1929; the ship was launched on May 16, 1930; and construction was completed on August 14, 1939 (Figure 9.45). The ship was built for the Osaka Shosen Company and its fast service for cargo and passengers to New York City.

⁶The discussion of prior research on TOKAI MARU and its historical background was written by David T. Lotz.



Fig. 9.41. NPS diver swimming over intact stack of CORMORAN in 1983. (NPS photo by Larry Murphy)



Fig. 9.42. Stack of CORMORAN, 1983. (NPS photo by Larry Murphy)



Fig. 9.43. Dan Lenihan videotaping CORMORAN wreckage. (NPS photo by Larry Murphy)

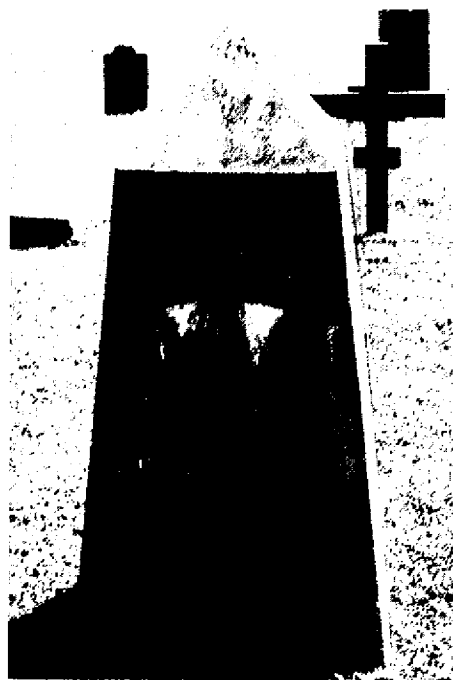


Fig. 9.44. Gravestone of CORMORAN crew member in Agana. (NPS photo by Larry Murphy)

On October 17, 1941, TOKAI MARU became a transport under contract with the Imperial Japanese Navy at Kure. TOKAI MARU's movements from that time until the initial attack on the ship in Apra Harbor are not known. On January 24, 1943, the transport was anchored in Apra Harbor.

The U.S. submarine, FLYING FISH, under the command of Lt. Comdr. G.R. Donaho, sailed to the Mariana Islands from Brisbane, Australia, on January 6, 1943, on its fourth war patrol. FLYING FISH arrived off Apra Harbor on January 24 and observed one ship anchored in the harbor. The submarine quietly patrolled outside the harbor for 3 days while waiting for ships to enter or leave the harbor. At 1710 on January 26, FLYING FISH fired two torpedoes at TOKAI MARU from 1,500 yards outside Calalan Bank. They were both set at zero depth to clear the shallows; however, the second torpedo exploded on Calalan Bank.

When the first torpedo hit, "...the target was completely obscured by water and spray momentarily and black smoke was visible after the spray subsided. Target replied with gunfire, apparently aimed at random" (report of war patrol, U.S. submarine FLYING FISH, 1943). As a result of this attack, TOKAI MARU was damaged but not sunk.

USS SNAPPER, on its seventh war patrol under the command of Lt. Comdr. M.K. Clementson, approached Apra Harbor on August 20, 1943, and noticed two large ships moored in the northeast area of the harbor. SNAPPER secretly patrolled outside the harbor for 7 days with the intent to sink the ships when they left the harbor. However, SNAPPER did not know that the vessels were the previously damaged TOKAI MARU and NICHIIYU MARU. After waiting a week, SNAPPER made a submerged attack on August 27, described in the patrol report as follows:

- 1400 Headed in to a position bearing 313^oT 1600 yards from center of harbor entrance channel.
- 1445 Battle stations. Main gyro oscillating so used auxiliary gyro for fixes.
- 1522 In position, targets are presenting about 100^o port track. Patrol vessel dead astern about 3500 yards. Exposed about six feet of periscope to check on any obstructions along torpedo track and as none were sighted decided that chances favored a hit. At 1523, fired three torpedoes at bow, midships and stern of nearer ship and one torpedo at center of further ship. Swing ship hard left to clear shallow water coming to course 250^oT. Observed patrol vessel minding his own business and proceeding slowly to northward. At 06:05 sighted

370

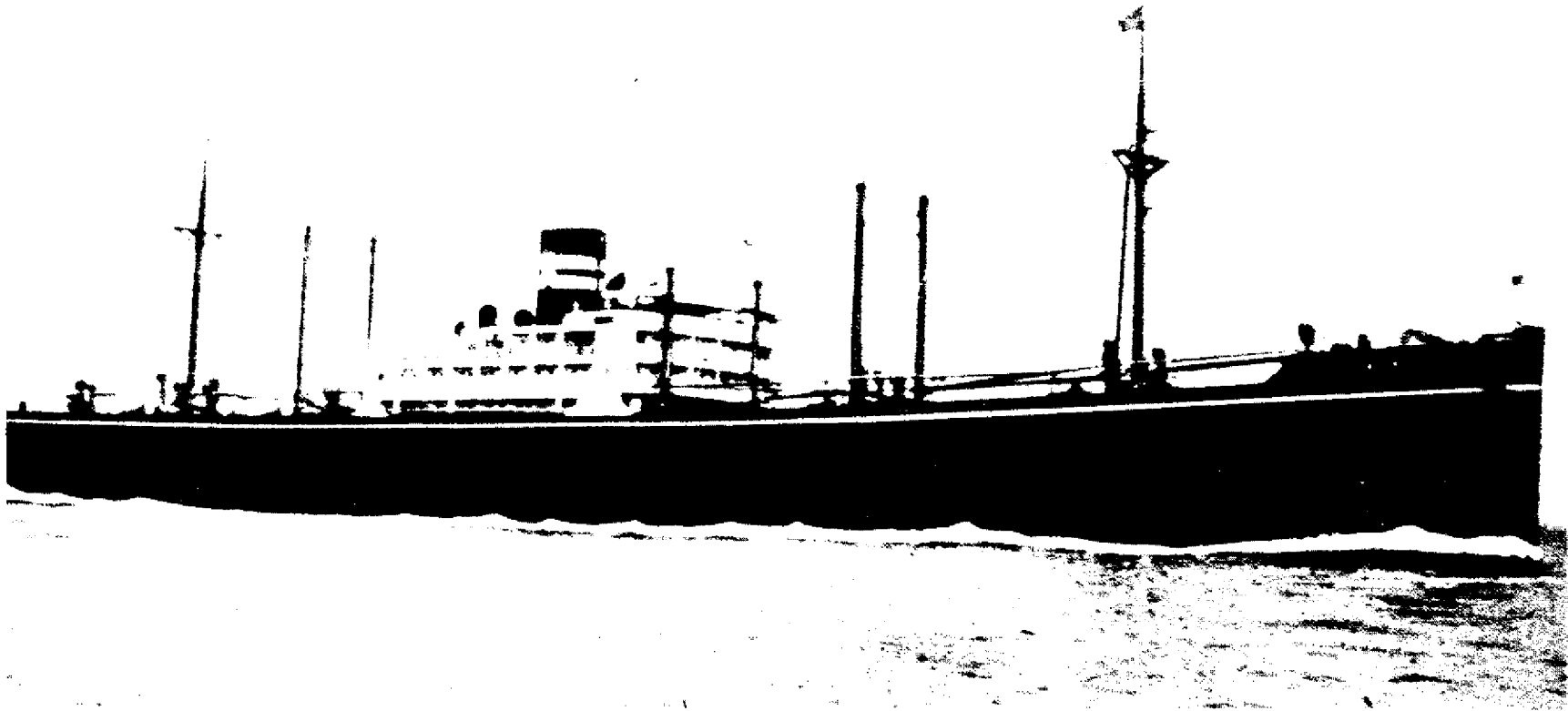


Fig. 9.45. Historic photograph of Japanese transport TOKAI MARU. (Photo courtesy of GovGuam)

NO. 1 target down by stern and heading 10°-15° to port, stern enveloped in gray-black smoke and air filled with debris. 07:00 stern of ship submerging and more debris in vicinity of #1 target around stern. 08:00 last view of target showed it submerged from amidships aft and bow quite high. Believe his stern was on the bottom. The water line was seen to be about half way up the after king posts with a 15 angle down by the stern. At 11:00 heard two very faint explosions a few seconds apart which may have been the other two torpedoes exploding on beach. For the next 10-15 minutes heard some very distant explosions undoubtedly inside the harbor and one explosion about 1500 yards away, probably from the patrol vessel. His screws were not heard after this so it is believed possible that this nicely inefficient gent probably decommissioned himself. Departed from area at good speed and depth, however.

Following the attack, TOKAI MARU settled on the bottom, touching the World War I German auxiliary cruiser, CORMORAN.

TOKAI MARU is an 8,359-gross-ton, Japanese, passenger and cargo ship with two two-cycle, six-cylinder, diesel engines. The ship has a net tonnage of 5,047 tons, a displacement of 15,801 tons, a dead weight of 10,108 tons and a cargo volume of 17,455 cubic meters. The water line length is 135.94 meters with a width of 18.44 meters, a depth of 12.42 meters and a draft of 8.53 meters. The engines developed a horsepower of 8,138 with a cruising speed of 14.19 knots and a maximum speed of 18.323 knots. The ship's serial number is 36099 and call sign was JJJC.

The passenger and cargo ship was built as a modern motorship with a superstructure amidship of four decks. On top is a squat funnel. The deck is flush except for a raised poop. The bow is plumb and it has a cruiser-spoon stern. TOKAI MARU has four masts, and the foremast and aftermast have crosstrees, while the mainmast and mizzen are goal posts. Numerous derricks are attached to the masts.

Present Description and Analysis⁷

TOKAI MARU lies on its port side at an angle of 85 degrees in 120 feet of water (Figures 9.46 and 9.47). The depth at the

⁷The present description and analysis section on TOKAI MARU was written by Larry Murphy.

starboard rail is 95 feet, the port rail amidship 110 feet, and the minimum depth on the site is 50 feet at the midships structure. The bow points about 44 degrees magnetic.

There is a gunmount on the bow; however, the gun has been removed, reportedly by the US Navy in 1965, and displayed at Polaris Point, Guam. The gunmount has none of the wooden decking, but the circular beams that supported it are present. Damage is visible on the starboard bow. There are three 36-foot-long forward holds, each with a set of masts and cargo winches (Figure 9.48). The forward mast, a single mast, is broken about 25 feet above the deck with the 20-foot upper portion still attached but hanging down over the lagoon floor (Figure 9.49). Booms extend forward and aft from the forward mast and second mast.

The second mast is a 55-foot, "goal post," twin mast joined by a crosstree. The top of this mast and the 40-foot masts just forward of the amidship superstructure apparently serve as ventilators. There are vent-like openings in the rounded mast cap of all four masts (Figure 9.50). There are deckhouses at the base of the masts.

The portside hull of the Number 2 cargo hold is damaged, apparently by a blast. Scrap steel, including car and truck frames, is reported in the cargo holds.

The bridge and four decks of superstructure are intact (Figure 9.51). Boat davits remain in place. The stack is in place as are ventilator shafts. A corporate emblem made of welded plate is visible on the stack. Down the starboard hull, the 115-foot-long bilge keel can be observed. The CORMORAN stern lies directly below the aft end of the bilge keel.

The forward set of aft masts are of the "goal post" type and are situated between the two aft hatches. The forward booms are in place over the hatch, the aft booms have dropped into the open hatch.

The single aft mast has no booms attached, but the cargo winches are in place and undamaged. This mast would have probably had booms forward and aft to service the holds. Both doors of the deckhouse beneath this mast are open.

There is a stern deckhouse that contains four depth charges on the port side. US Navy Explosive Ordnance Disposal (EOD) divers have identified the depth charges as Japanese Type 95. Marine growth prevented the determination of whether the devices are armed or not. The cylindrical steel charges each contain 325 pounds of explosives and present a safety hazard. Discussions between EOD and the Guam State Historic

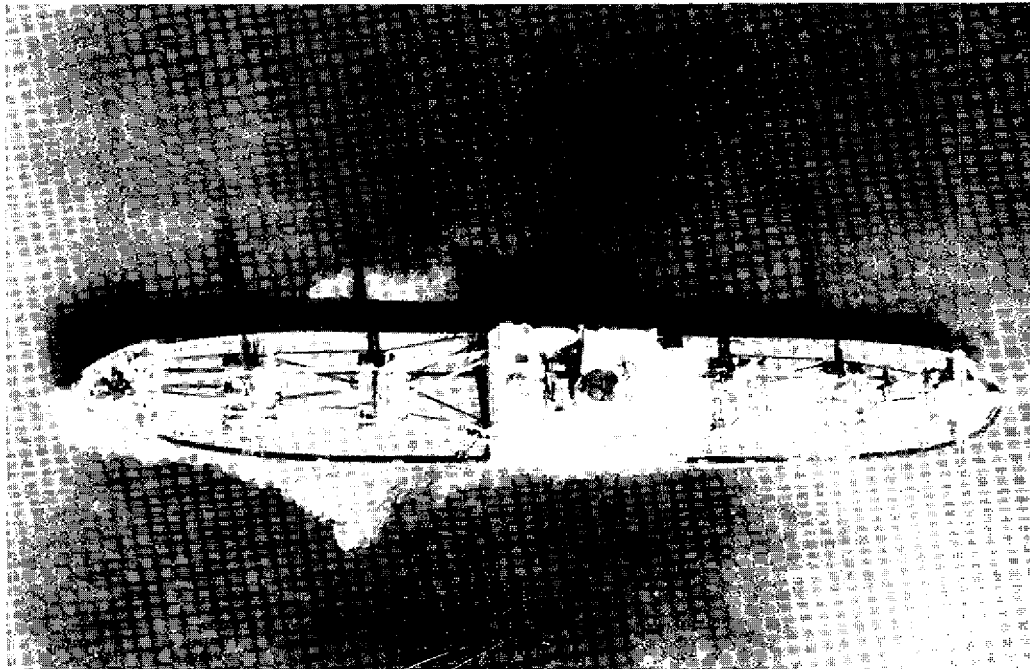


Fig. 9.46. Deck view of TOKAI MARU.

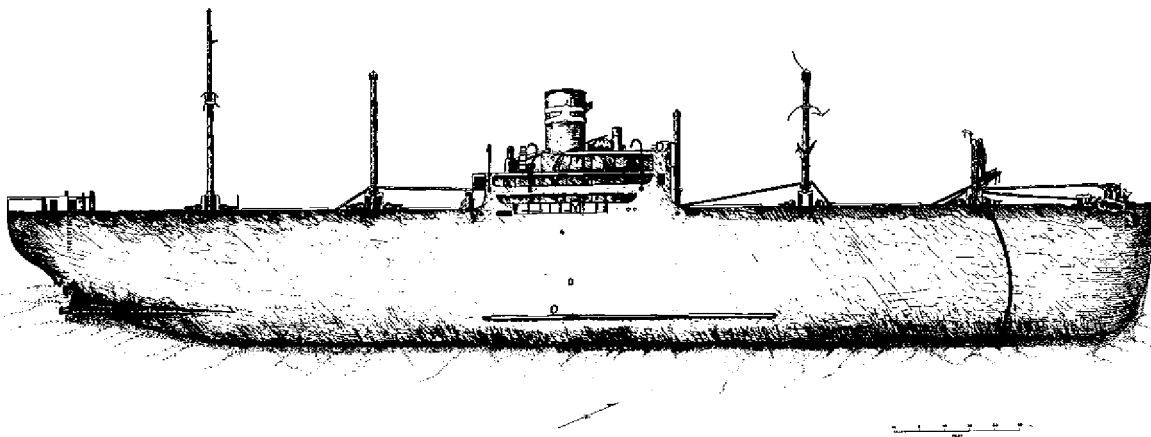


Fig. 9.47. Planimetric view of TOKAI MARU site. (Drawn by Jerry L. Livingston)

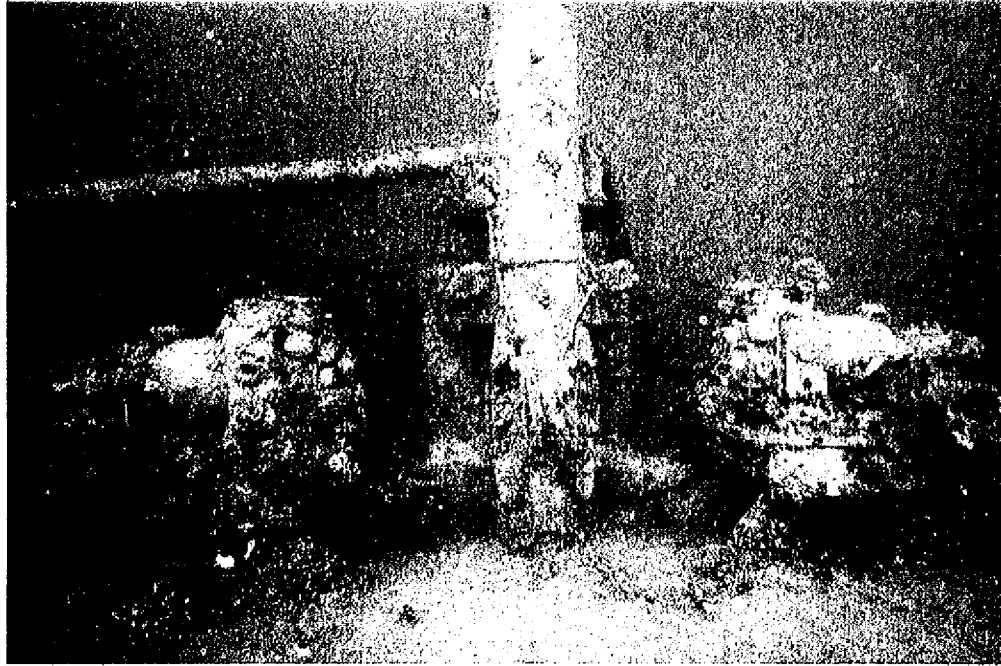


Fig. 9.48. Cargo-handling winches on deck of TOKAI MARU.
(NPS photo by Larry Murphy)

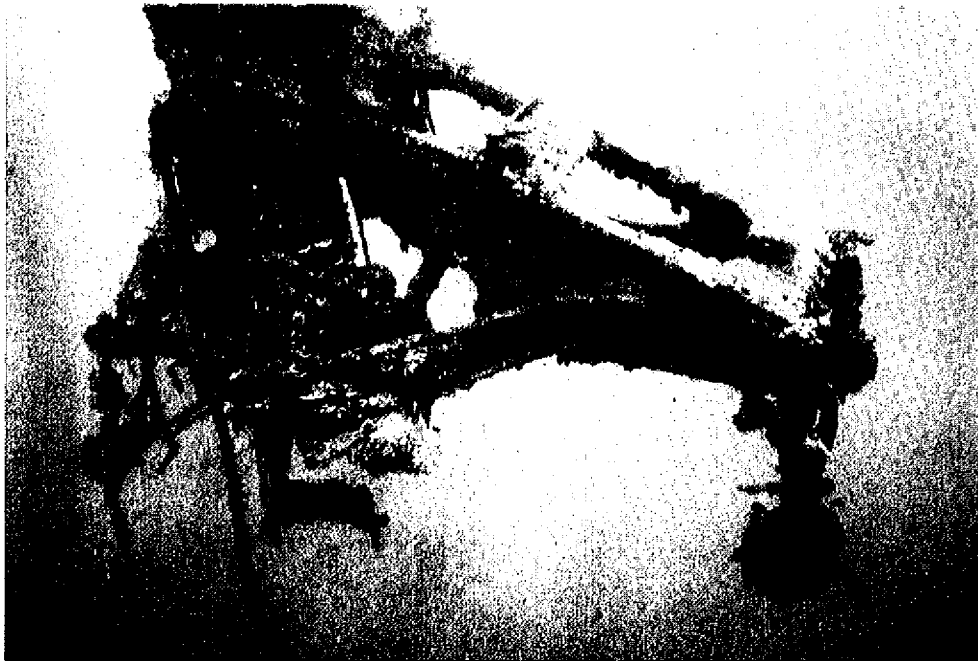


Fig. 9.49. Broken forward mast of TOKAI MARU hangs suspended
over lagoon bottom. (NPS photo by Larry Murphy)

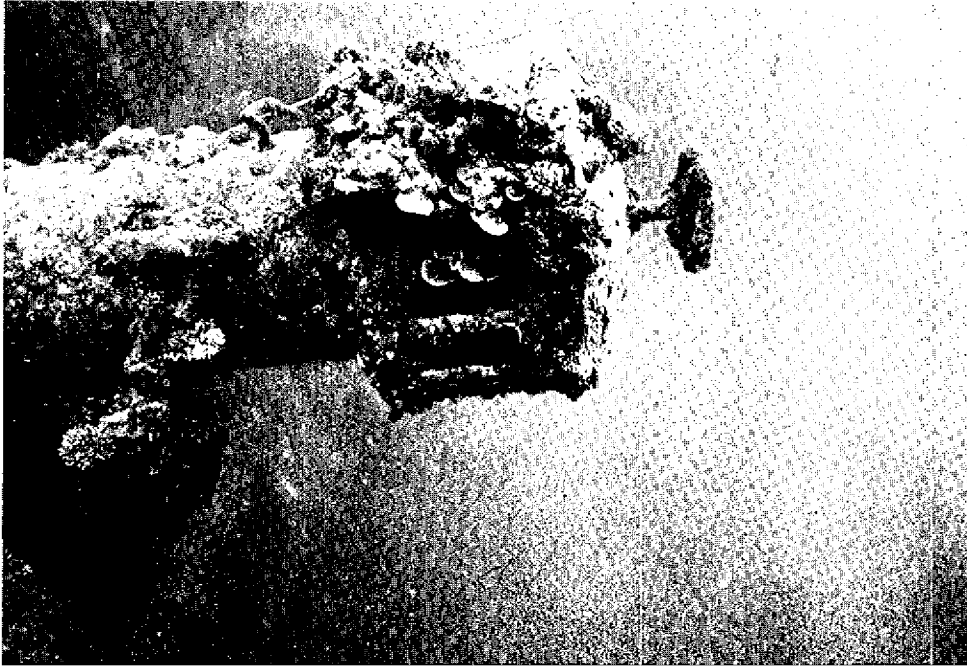


Fig. 9.50. Valve handle, probably for ventilator, on mast cap of TOKAI MARU. (NPS photo by Larry Murphy)



Fig. 9.51. Superstructure starboard amidships of TOKAI MARU. (NPS photo by Larry Murphy)

Preservation Officer are being conducted regarding disposition of the explosives.

The screws have been removed and the rudder is missing. The hull is torn above the starboard shaft.

A torpedo has blown a hole in the Number 2 port cargo hold. There is some damage to the starboard bow around the railing. The cargo holds contain scrap steel, car and truck frames, bed springs, and a truck. Some parts of the ship have been removed by divers including the 8-cm bow gun removed by the U.S. Navy in 1965. The gun is presently located at Polaris Point. Except for the war-damaged and the removed parts, the vessel is intact.

KITSUGAWA MARU⁸

KITSUGAWA MARU was located during a 1976 survey of Apra Harbor. In 1978 the Guam Department of Parks and Recreation conducted a preliminary survey of the site. In the summers of 1986 through 1988, the U.S. Navy in cooperation with the SCRU (Project SeaMark) accomplished mapping of the KITSUGAWA MARU with the assistance of Naval reserve mobile diving and salvage units. This project gave the Navy a focus for reserve diver training in addition to historic preservation goals.

KITSUGAWA MARU was used during World War II as a transport by the Imperial Japanese Navy. It presently lies at the bottom of Apra Harbor (refer to Figure 9.35).

Historical Background

KITSUGAWA MARU was launched on September 15, 1940, from the Kawanano Kogyo Shipyard in Nagasaki, Japan; construction was completed on June 27, 1941 (Figure 9.52). Although it was built for the Toyo Kaiun Company, it became a transport under contract to the Imperial Japanese Navy at Yokosuka on September 29, 1943. On October 20, 1943, it left Saeki for New Guinea via Palau in convoy 010. On November 28, 1943, the transport left Palau on the return voyage and arrived in Saeki on December 3, 1943, on convoy Hr 009. On January 25, 1944, it left Saeki and arrived in Palau on February 6, 1944. The subsequent departure date from Palau is not known.

⁸The discussion of previous research and historical background on KIZUGAWA MARU was written by David T. Lotz.

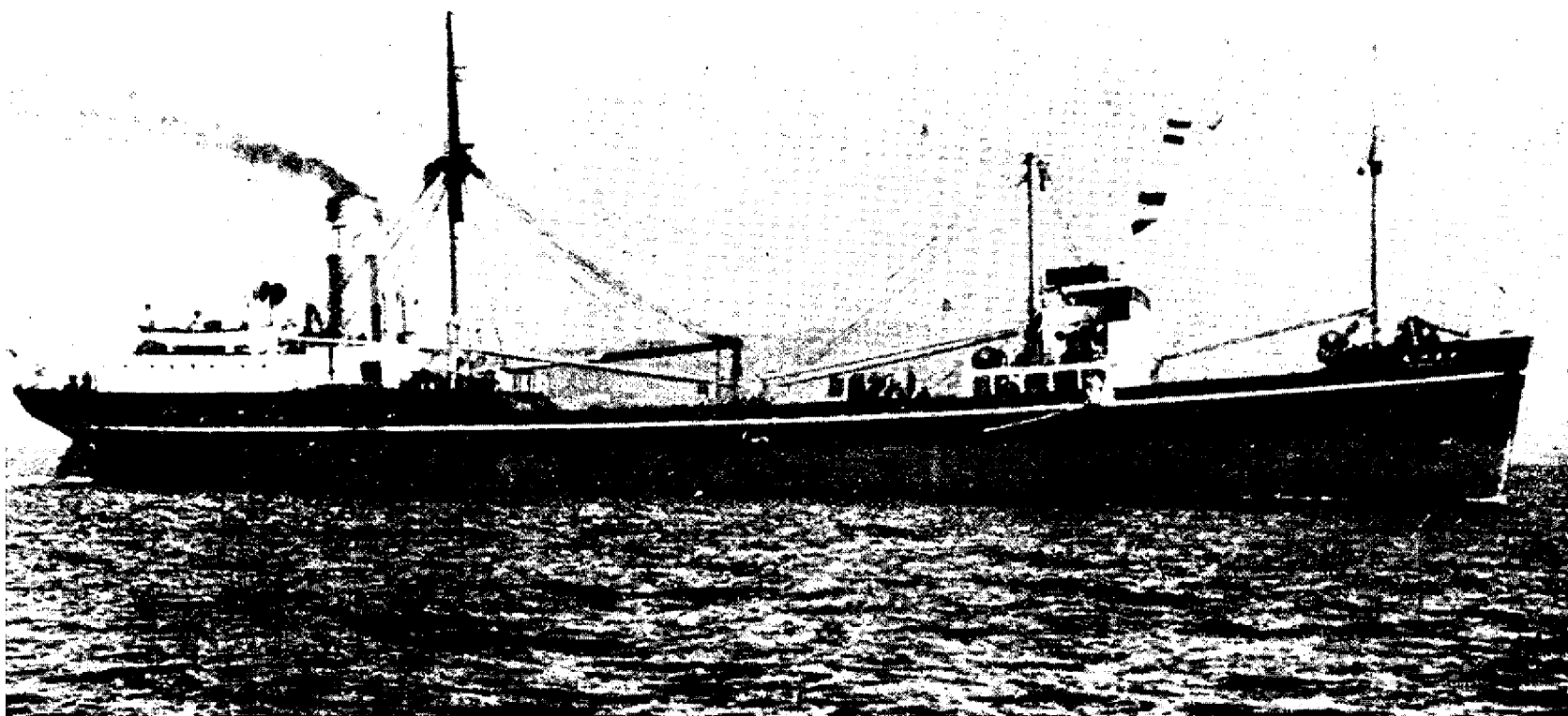


Fig. 9.52. The transport KITSUGAWA MARU after being commissioned into the Japanese Navy. Note the deck gun in the bow. (Photo courtesy of GovGuam)

However, on the night of April 8, 1944, the U.S. submarine, SEAHORSE, was conducting a night attack to the southeast of Guam on a Japanese convoy of three freighters escorted by two destroyers. Departing Pearl Harbor on March 16, the SEAHORSE, under the command of Lt. Cdr. Slade Cutter, was on its fourth war patrol. Cutter made contact with the convoy by using sonar and then conducted a submerged attack. Four torpedoes were fired at 0221 at a large transport, with torpedoes set to run 10 feet below the surface.

Three hits were heard and a tremendous explosion shot flames high into the air. At 0222, a second attack was conducted using the same method as the first, by firing a spread of torpedoes at a second large transport. One torpedo hit the middle of the target and caused the ship to burst into flames. Three hours later, one of the targets was observed listing low in the water and on fire. ARATAMA MARU was hit in the first attack and KITSUGAWA MARU was hit in the second. KITSUGAWA MARU did not sink but was severely damaged and was towed into Apra Harbor. It remained there while the Japanese attempted to repair the damage.

American aircraft carrier attacks on Guam began in June 1944, prior to the invasion of Guam in mid-July. The strike force was launched on June 25 from USS ESSEX, part of Task Force 58, and comprised planes from Air Group 15. The strike led by Lt. Comdr. J.E. Rigg took off at 1027 and focused on Japanese installations on and around Orote Field. The force consisted of 15 F6F-3 Hellcat fighters, 12 SB2C-1C Helldiver dive bombers and 5 TBF-1C Avenger torpedo bombers.

During the approach to Orote Field, Lt. C.H. Sorensen, flying a TBF-1C, was directed to fire rockets on a freighter in Apra Harbor, KITSUGAWA MARU. Sorensen approached east to west. He dived from 6,000 feet in a 45-degree dive, fired eight 5-inch rockets in pairs from 2,500 feet to 1,000 feet in altitude, and pulled out at 500 feet. Six hits were seen amidships without apparent damage.

On June 27, 1944, a strike force from Air Group 10 was launched from USS ENTERPRISE at 1400 to attack Apra Harbor and Orote Field. The strike force comprised 12 F6F-3 Hellcat fighters, 12 SBD-5 Dauntless dive bombers, and 9 TBF-1C Avenger torpedo bombers. The first division of dive bombers attacked the damaged KITSUGAWA MARU and scored two direct hits and three near misses to sink the ship where it rests today.

KITSUGAWA MARU is a 1,915-gross-tonnage, Japanese-built, steel-hull freighter with a single engine. The ship has a net tonnage of 1,056 tons, displacement of 4,149 tons, dead weight of 2,838 tons, and a cargo volume of 3,631 cubic

meters. The water line length is 82.82 meters with a width of 12.20 meters, a depth of 6.20 meters and draft of 5.40 meters. The engine developed 1,684 horsepower with a cruising speed of 11.0 knots and a maximum speed of 12.8 knots. Its serial number is 48643 and the call sign was JHQP.

The transport was built with the machinery space and superstructure aft and bridge just forward of amidships. It is well-decked with islands fore and aft. The bow is raked and it has a counter stern. The stern funnel is medium-sized and not raked, and the ventilators are a cowl type. It has a foremast, an aftermast, and goalpost mainmast; all three masts have derricks.

Present Description and Analysis⁹

KITSUGAWA MARU presently lies in 140 feet of water in Apra Harbor (Figure 9.53). KITSUGAWA was torpedoed by the submarine, SEAHORSE, on April 8, 1944. The ship was severely damaged and towed into Apra Harbor, where it was sunk by U.S. bombers on June 27. KITSUGAWA MARU, long known as "The Bow Gun Wreck," lies in 140 feet of water about 500 yards south of Hotel Wharf in Apra Harbor.

The bow gun of the ship is in 110 feet of water (Figure 9.54). The gun is in place and pointing toward the port quarter. The gunmount had a wooden deck mounted upon a circular beam arrangement built above the deck. Access to the mount is from the port side. Ready boxes of ammunition, which still contain rounds, are to the aft of the mount. The mount appears typical of bow mounts observed on other transports and may represent a standardized arrangement for Japanese military conversions.

The bow deck machinery is present and in good shape, and there are few signs of battle damage. Two wire rope mooring winches are between the bow quarter bits port and starboard. The windlass is in place, and an anchor cable of open-linked chain comes up out of the deck from the chain locker across the windlass and down the starboard hawse pipe.

Two cargo winches are on the f'c'sle deck, each with a single warping drum. The booms are in place and secured in their mounts against the forward bulkhead of the bridge. The strongbacks are also all in place in the forward hatch, which

⁹The discussion of KIZUGAWA MARU's present description and analysis was written by Larry Murphy.

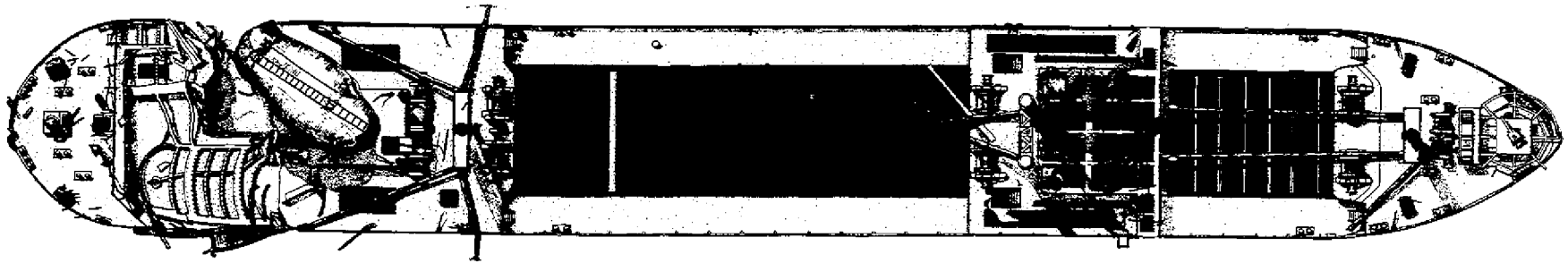


Fig. 9.53. Planimetric view of KITSUGAWA MARU. (Drawn by Jerry Livingston and Tony Wiley)

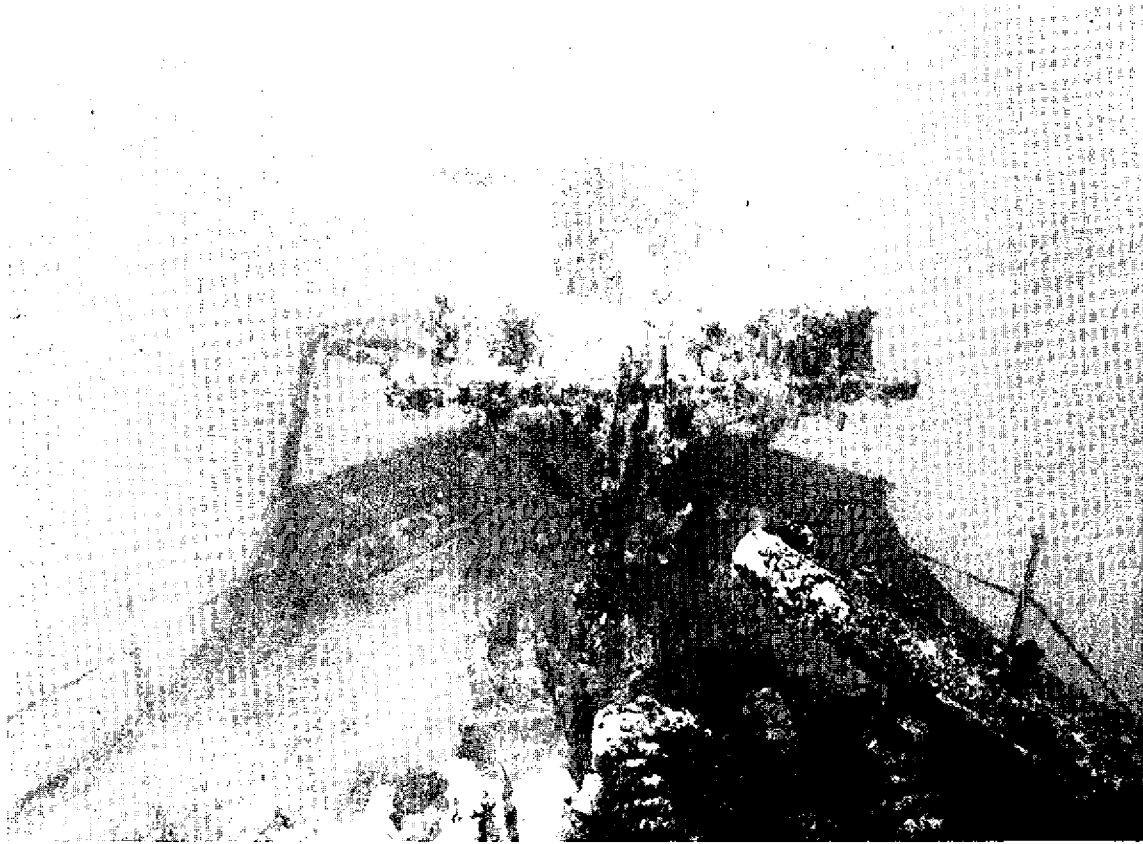


Fig. 9.54. Bow gun of KITSUGAWA MARU. (NPS photo by Larry Murphy)

indicates the hold was probably secured for sea, rather than prepared for cargo handling.

The bridge has sustained severe damage. Most of it has been leveled and only the thwartship beams are present. Interior spaces can be entered. A bath has been reported amidships and a radio room reported below on the starboard side.

The 60-foot mainmast, which is a "goal post" configuration with two masts linked at the mast top, is standing, but the booms have been damaged. Portions of the booms are lying in the main hatch. The four cargo winches that served the main hold contain no wire rope. It is unlikely this was removed as a part of salvage operations; rather they must have been in the process of rerigging the main hold lift gear after the April 1944 torpedoing.

Forward of the main kingpost are two tanks of unknown purpose. The starboard one is damaged, the port one intact. Two hatches, port and starboard, just aft the kingpost lead down to the midship machinery spaces.

The main hold has one strongback in place. The interior of the hold was not investigated, and it is unknown whether the rest of the strongbacks are in the hold or were removed before sinking. Because there is a half-meter hole in the port hull amidships, the strongbacks may have been removed after the April torpedoing to facilitate repairs. The port hull hole may be torpedo damage. The mud line is 14 feet below the rail of the main deck.

The aft mast had four booms and four cargo winches. The two aft are rigged with cable. The two aft booms are in place; the two forward ones have been displaced and lie over the gunwale.

The majority of battle damage is in the stern area aft the stern mast. The stern rail is in 140 feet of water. The stack has fallen to the port and is collapsed. The boiler room may be intact, but the engine spaces appear to have suffered a direct hit. The most extensive damage is on the port side where a major section of deck and hull have been blown out. About 40 feet of hull have been affected with a 30-by-15 foot section blown out. The starboard hull side has been pushed outboard by the blast. Casualties are not reported for this shipwreck, but if the stern crew spaces were occupied, casualties must have been heavy.

Emergency steering and binnacle mounts remain on the quarterdeck. The starboard ventilator cowl is in place near a skylight. Judging from the damaged structure on the

starboard side, there must have been a deckhouse of some sort on the quarter deck.

Although the interior spaces were not surveyed, it is expected that crew's quarters, machinery and steering spaces could be entered and likely contain significant artifacts. The starboard door to the spaces is lying on the main deck.

Mooring winches are in place on the deck, port and starboard. These winches may have been confused by some as depth charges; earlier reports describe a 55-gallon-drum-sized object on a "release rack" on the stern.

KITSUGAWA MARU was damaged by the anchor of ASIAN LILY, which was observed moored over the site in August 1990 (Pacific Daily News, August 7-8, 1990). A group led by NPS ranger Jim Miculka assessed the damage and determined the LILY's anchor had hit the forward kingpost on the starboard side and dislodged the mast cap. The cap damaged a ladder, and there was evidence that the anchor hit the cabin and pulled a portion of a bulkhead upward. Coral was damaged, and other ship pieces were observed.

KITSUGAWA MARU has a large hole blown in the port hull amidships, about 0.6 meters in diameter. The port derricks have fallen into a hold amidships. There is coal in the port stern and a small compressor starboard stern. Access to the holds is via ladders amidships, bow and stern of holds. A deck-level door leads to the aft superstructure. This door is just to port of a ladder leading up to the deck. The door has been blown off and lies on the deck. The doorway opens into a large storage area that contains four or five shackles. The engine room has been blown up. The stern portion of the ship was blown away from the hull.

NICHIYU MARU¹⁰

In 1978 the Guam Department of Parks and Recreation conducted a preliminary survey of NICHIYU MARU. NICHIYU MARU was used during World War II as an auxiliary minelayer by the Imperial Japanese Navy. It presently lies at the bottom of Apra Harbor (refer to Figure 9.35).

¹⁰The discussion of NICHIYU MARU was written by David T. Lotz.

Historical Background

NICHIYU MARU was built for the Kisen Nissan Steamship Company. Although launched on March 3, 1933, at the Kawanau Kogyo Shipyard in Nagasaki, Japan, its construction was not completed until December 28, 1933. The ship was requisitioned by the Japanese Navy in 1940 (Figure 9.55).

USS PERMIT (SS-178), under the command of Lt. Comdr. Wreford G. Chapple, arrived off Guam from Midway on May 4, 1943. While submerged off the harbor on its eighth war patrol, PERMIT observed two ships leaving the harbor with a torpedo boat escort. At 0822, on May 5, 1943, four torpedoes were fired at the second ship with one hit being heard; NICHIYU MARU was damaged in the attack. The torpedo boat escort immediately attacked and depth-charged PERMIT, which caused slight damage to the submarine. After the attack, NICHIYU MARU returned to Apra Harbor to attempt repairs.

Unable to escape from Apra Harbor, NICHIYU MARU awaited its final fate as the U.S. fleet approached Guam in June, 1944. The Battle of the Philippine Sea occurred on June 19-20, and afterwards there was increased attention to Guam, scheduled for invasion on July 21. Fortifications, airfields, and shipping in Apra Harbor were targets for destruction by the 5th Fleet.

On June 24, 1944, two planes of Air Group 15 from the USS ESSEX spotted a large cargo ship in Apra Harbor. Flying TBF-1C, Avenger torpedo bombers, Lt. (jg) R.L. Bentz and Ens. Harry A. Goodwin attacked with rockets and machine guns.

On June 25, 1944, USS CAPERTON (DD-250, Fletcher class destroyer) was on lifeguard duty north of Ritidian Point, Guam, for the early afternoon strike on Guam. After picking up a pilot in the water, the crew observed a large freighter in Apra Harbor. After permission was received, CAPERTON closed the harbor and commenced shelling at 1722.

After three firing runs on the freighter, 320 rounds of 5-inch, 38-caliber ammunition were expended, and about 40 hits were observed; the ship was left in a damaged and sinking condition. A hurried departure, at 33 knots, was made by CAPERTON, which steered a radically evasive course to evade the shore battery fire that was straddling the ship.

NICHIYU MARU is a 6,817-gross-ton, Japanese steel-hull freighter. The ship has a net tonnage of 3,990 tons and a cargo volume of 9,827 cubic meters. The water line length is 136 meters with a width of 17.7 meters, and a depth of 10 meters. The engine developed 4,537 horsepower for a maximum

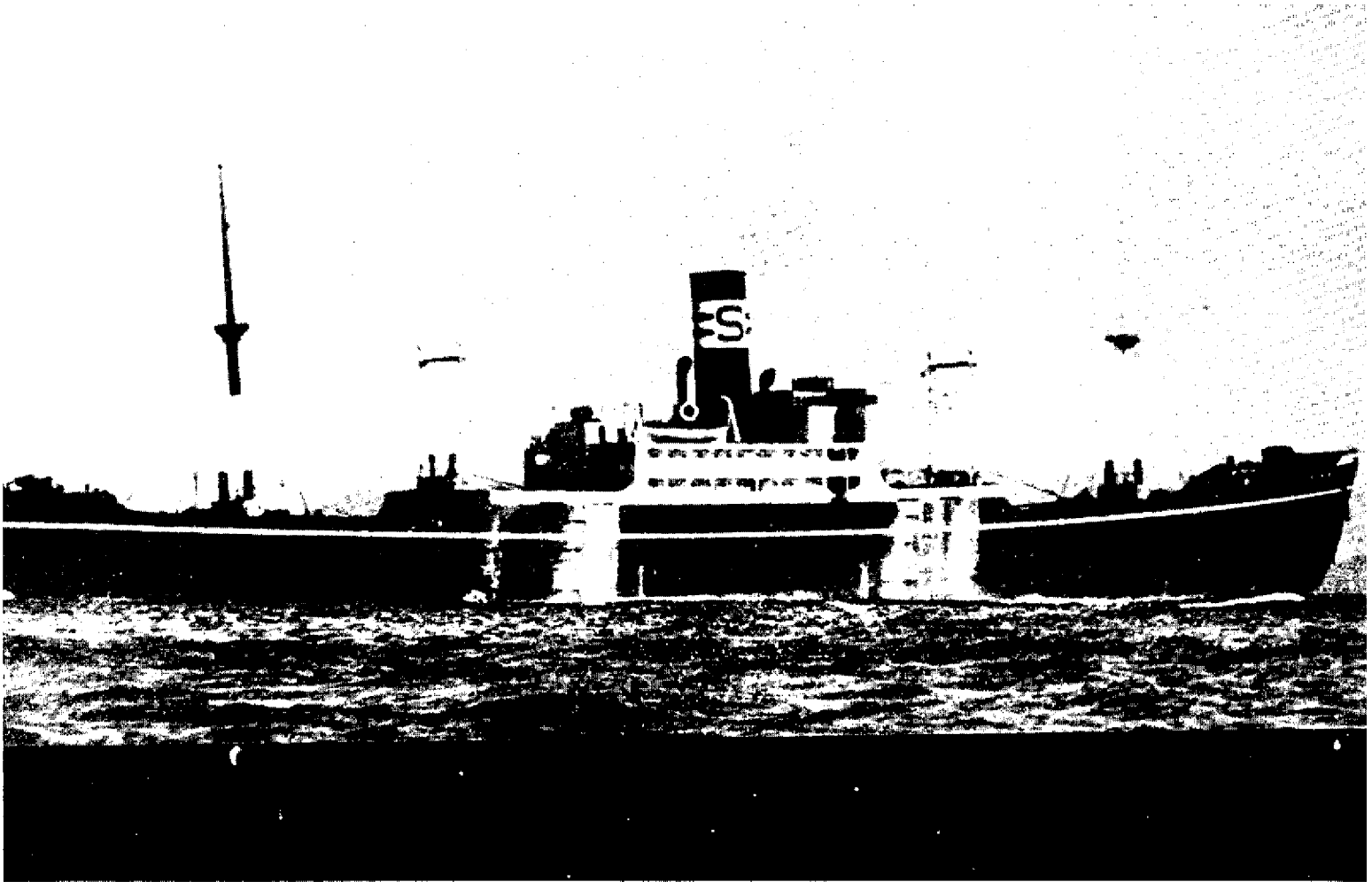


Fig. 9.55. Historic photograph of NICHIIYU MARU after requisitioning by the Japanese Navy. (Photo courtesy of GovGuam)

speed of 15.5 knots. The serial number is 45497 and its call sign was JUVM.

NICHIYU MARU was built with a superstructure amidships. The ship was well-decked and raised fore and aft. The bow was raked, and it had a spoon stern. The single funnel was medium and raked. The ventilators were cowl type. The ship carried a foremast, mainmast, mizzen and aftermast. The foremast and aftermast each had crosstrees. The mainmast and mizzen were goal posts; all masts had derricks.

Present Description and Analysis

NICHIYU MARU lies below a commercial fuel pier in 100 feet of water in Apra Harbor (refer to Figure 9.35). The ship was heavily damaged as the result of blasting done by commercial divers to remove the upper structure of the ship to increase the depth in the area for commercial shipping. The forward third of the ship is relatively intact with the kingpost blasted off; the remainder is broken up. The shallower blasted portions are characterized by heavy siltation. Cargo hold Number 1 contains electric fans and scrap metal. Hold Number 2 is heavily damaged. The aft section of Number 2 has collapsed. The main deck is now nearly lying on the deck below as a result of blasting to reduce the navigational hazard. The engine room is spacious but broken up. On the port side, a kingpost boom lies against the hull.

ARATAMA MARU¹¹

In 1987 the Guam Department of Parks and Recreation sponsored an underwater archeology survey and training program with the SCRU, NPS. The 2 1/2-week course in May 1987 brought participants from the Northern Mariana Islands, Belau, Kosrae, and San Francisco to Guam for classroom sessions in shipwreck archeology and protection issues and fieldwork in shipwreck mapping and photography on the ARATAMA MARU. They also made a video documentary of the ARATAMA MARU during the project.

ARATAMA MARU was used during World War II as a transport by the Imperial Japanese Navy. It presently lies at the bottom of Talafofo Bay on the southeast side of Guam (Figure 9.56).

¹¹The discussion of prior research and the historical background on ARATAMA MARU were written by David T. Lotz.

Historical Background

On August 27, 1941, ARATAMA MARU was contracted by the Imperial Japanese Navy as a transport and was used to move supplies to Japanese installations in the Marshalls and Palau from 1941 to 1943 (Figure 9.57).

In March 1944, ARATAMA MARU left Yokusuka, Japan, under the command of Captain Oshikura. The ship arrived in Palau on March 27 and left on March 29, with six other ships, for Saipan where they arrived on April 5. On April 7, ARATAMA MARU left in a convoy with other ships and two escorts. During the darkness of the early morning of April 8, the convoy was 10 nautical miles east of Guam and traveling at 13 knots on a course of 250 degrees to the west-southwest.

The convoy was spotted by the submarine, USS SEAHORSE, that subsequently conducted a night attack on the Japanese convoy to the southeast of Guam. Departing Pearl Harbor on March 16, SEAHORSE, under the command of Lt. Comdr. Slade Cutter, was conducting its fourth war patrol. Cutter made contact with the convoy by using sonar and then conducted a submerged attack. Four torpedoes, set to run 10 feet below the surface, were fired at 0221 at a large transport. Three hits were heard and a tremendous explosion shot flames high into the air. At 0222, a second attack was conducted using the same method, firing a spread of torpedoes at a second large transport. One torpedo was observed to hit the middle of the target, which caused the ship to burst into flames. Three hours later, one of the targets was observed listing low in the water and on fire. The damaged ship was also observed by the USS GREENLING, which was in the vicinity on a special photographic reconnaissance mission. KITSUGAWA MARU and ARATAMA MARU were both hit in the attack.

ARATAMA MARU suffered a torpedo hit in the Number 3 cargo hold forward of the bridge on the starboard side. The ship was immediately engulfed in flames, and the engines stopped when the engine room was flooded. The crew abandoned the ship and were picked up by one of the escort vessels.

For 3 days, ARATAMA MARU drifted north-northwest toward Guam. After drifting unmanned, the ship initially hit and rested on the reef at the north edge to the entrance of Talofofu Bay. On April 12, 1944, ARATAMA MARU was observed by GREENLING beached at Ipan Point, the northern entrance to Talofofu Bay. Later, the currents and surge moved the ship to the present location off the south shore of Talofofu Bay immediately offshore from Gayloop Cove with the bow facing the mouth of Talofofu Bay. It ultimately sank in that location, and all of the immediately salvageable items of the cargo were taken off to YASUKUMI MARU (Figure 9.58).

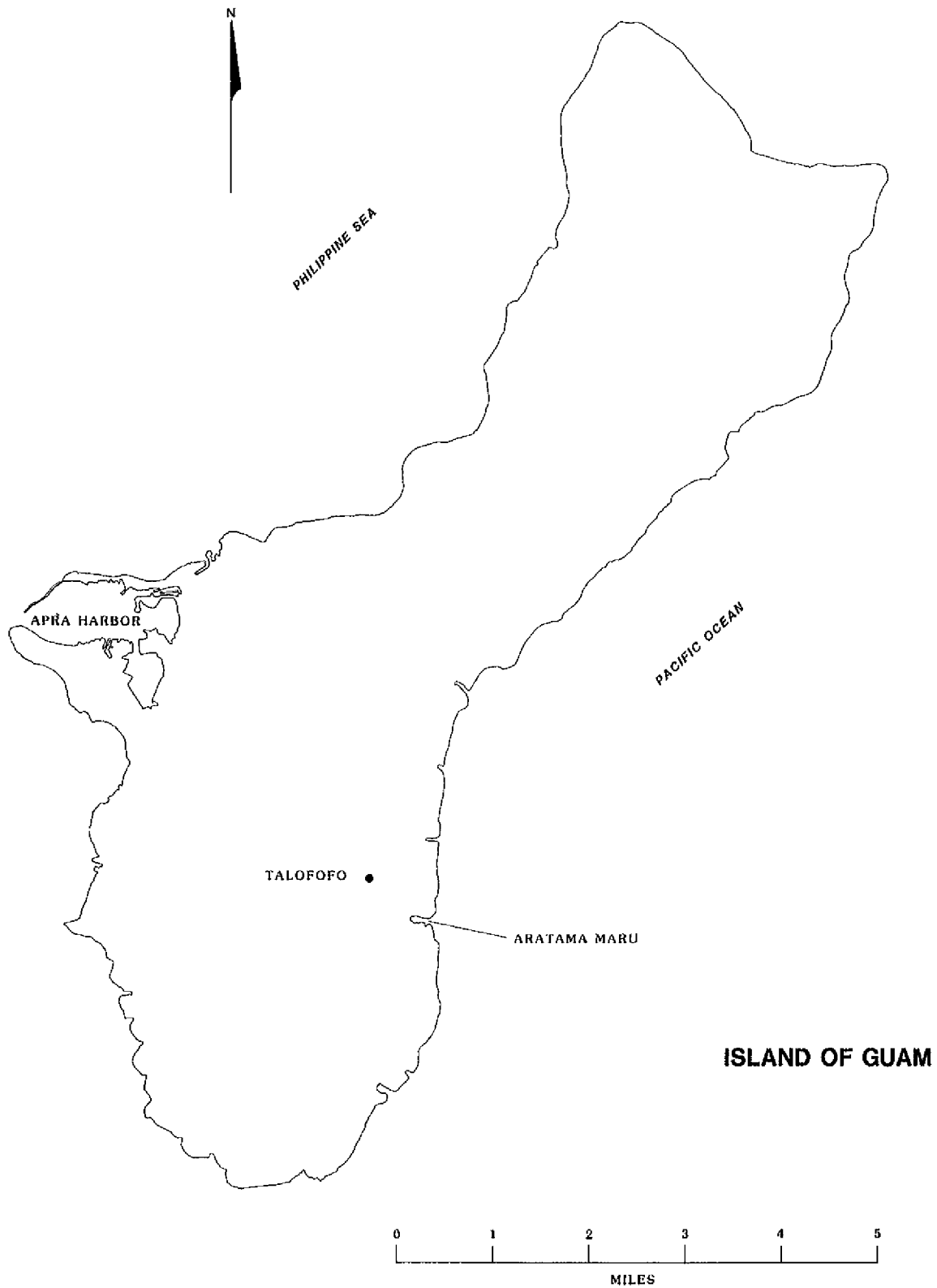


Fig. 9.56. Location of ARATAMA MARU in Talofofu Bay, Guam.

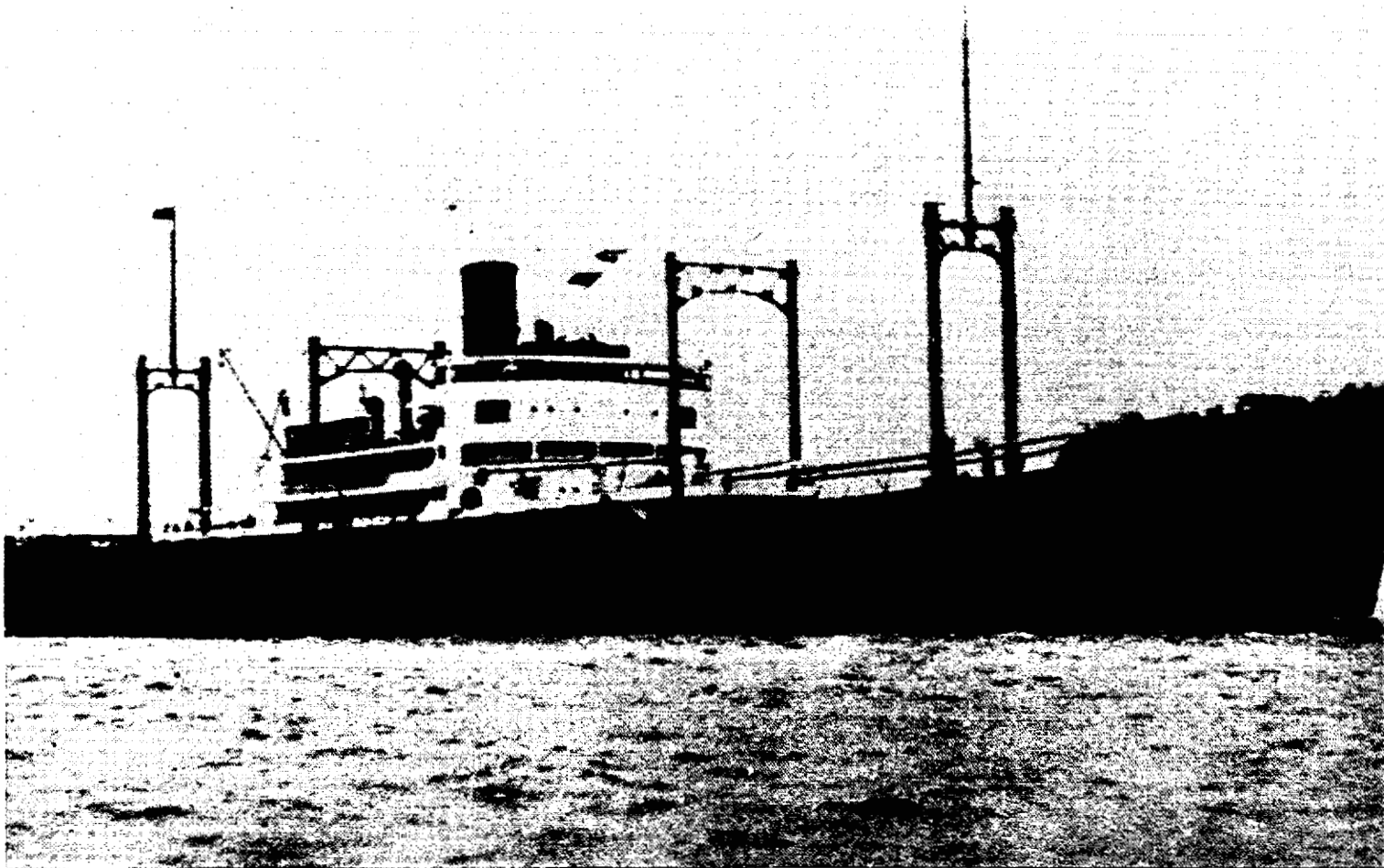


Fig. 9.57. Historic photograph of ARATAMA MARU. (Photo courtesy of GovGuam)

ARATAMA MARU is a 6,783-gross-tonnage, Japanese, steel-hull freighter with a steam turbine. The transport was built by the Tsurumi Steel Shipyard in Japan and launched on July 27 , 1938. It was built with a passenger superstructure amidships and well-decked fore and aft. The bow is raked with a cruiser spoon stern. The single funnel is medium and squat. The ship carried a goal-post foremast, mainmast, mizzen, and aftmast. All masts had associated derricks.

The ship had a net tonnage of 4,058 tons, displacement of 14,567 tons, dead weight of 10,200 tons, and a cargo volume of 15,637 cubic meters. ARATAMA MARU's water line length was 134 meters with a width of 18 meters, a depth of 10.3 meters, and draft of 8.2 meters. The engine developed 3,838 horsepower with a cruising speed of 12 knots and a maximum speed of 15.2 knots. The ship's serial number is 44850 and its call sign was JUHM.

Over the years, the vessel deteriorated because of several factors. ARATAMA MARU was used for target practice by U.S. military aircraft. A civilian firm, Pacific Rock Company, removed copper steam pipes during 1962-1964. Tropical storms and typhoons, especially Typhoon Karen in 1962, resulted in further damage to the ship. During the period 1944 to 1962, ARATAMA MARU was still partially visible above the surface of Talofofu Bay (Figure 9.59). However, after Typhoon Karen, it was no longer possible to see the ship from the surface (Figure 9.60).

Present Description and Analysis¹²

The wreck of ARATAMA MARU currently lies bow to seaward and the stern toward inner Talofofu Bay. The vessel came to rest in 50 feet of water at the base of the western reef face and shows signs of extensive alteration due to both natural and cultural processes. Most of the hull is present, with little superstructure noted (Figure 9.62).

The bow section is lying on its port side and is relatively intact from the stem post aft to the end of the deep floors; i.e., frames that have been deepened form the narrow bow and stern sections of the hull. The bow section contains the windlass with stud-link chain still attached and rigged to

¹²The present description and analysis of ARATAMA MARU was written by SCRU archeologist Larry Murphy as part of a final report to GovGuam in preparation for a nomination of the site to the National Register of Historic Places.



Fig. 9.58. ARATAMA MARU resting on the shallow bottom of Talofofo Bay in the 1940s. (Photo courtesy of GovGuam)



Fig. 9.59. ARATAMA MARU after target practice by U.S. aircraft in the 1950s. (Photo courtesy of GovGuam)



Fig. 9.60. Talofofo Bay after typhoon Karen in 1962. The shipwreck is no longer visible above the surface. (Photo courtesy of GovGuam)



Fig. 9.61. Group photo of participants in 1987 submerged cultural resources training program hosted by the Government of Guam and taught by the National Park Service Submerged Cultural Resources Unit. ARATAMA MARU was documented for the National Register as a course exercise.

the anchors. The chain comes from a large pile, in what was the chain locker, through the deck and over two half-circle fair-leads. The fair-leads have been torn intact from the deck and are hanging on the chain cables. A folding stockless anchor remains in the anchor pocket in the bow (Figure 9.63).

Directly aft of the bow section is a section of hull bottom that has been broken off from the bow. This section is slightly curved and contains a portion of the cast-iron keel that comprised the forefoot of the stem post.

Off to the port side of the bow is a deck stringer plate with the forward starboard gunwale. There are two winches in the immediate vicinity. The smaller, which is closer to the deck stringer plate, is probably the forward mooring winch. The larger winch is a cargo winch likely associated with the forward kingpost and Number 1 hatch.

The frames of the vessel are made of channel iron 30-by-10 centimeters, with the channels facing forward, and the bow frames are on 80-centimeter centers. The shell plates are double chain-riveted with alternating inner and outer stakes. There is triple riveting where the fore and aft plates overlap. The upper stakes overlap the lower, and the forward plates overlap the stern.

Aft of the bow section, approximately 70 feet from the stem and to starboard, is a section of hull side, with the weather deck. Approximately 170 aft of the stem is a portion of kingpost (Figure 9.64) and a standing bulkhead. Originally, there were other bulkheads forward of this one, and at least three forward holds. There is extensive damage in the area forward of this bulkhead, which may have been the result of the torpedo damage, natural forces, or later salvage activity. The deck and hull sides are broken, and large sections of structure are not present within the main site concentration area.

Two hundred feet aft, another bulkhead is standing, probably at the Number 3 hold where a torpedo was reported to have struck. The primary damage appears to have been forward of the machinery spaces, which is consistent with the historical records. Hold pillars (stanchions), 20 inches in diameter, are present and run down the port and starboard of the ship, rather than on the midline (Figure 9.65). No remains of cargo were located in this area. The only cargo located was aft of the machinery spaces and consisted of bags of cement, which had hardened.

The bulkhead forward of the machinery space is still standing. Directly aft of the bulkhead are three cylindrical



Fig. 9.63. The folding stockless anchor still remains in the anchor pocket in the bow. (NPS photo by Ken Vrana)



Fig. 9.64. Upper portion of a kingpost just below the bridge. (NPS photo)

(Scotch-type) boilers in place. The boilers and visible piping are substantial and indicate a high operating stem pressure. Some of the steam pipes and auxiliary pipes are broken, a result of either salvage operations or typhoon activity. The engine is not visible. Historical documentation indicates the vessel was powered by a steam turbine, which, if still aboard, is buried in the sediment to the top of the boilers. The hull sides are substantially intact in this area.

Aft of the machinery space, approximately 290 feet from the stem, the deck has partially collapsed and covers the aft bulkhead of the machinery spaces. The main ship power wiring harness is on the forward side of the bulkhead and indicates the probable location of the generator.

There is a 1-foot-high deckhouse located 320 feet aft of the stem to the port side; this may have been for fuel storage. There was no coal located around the wreck. Most Likely the vessel was oil-fired. Additional examination is needed to document the fuel distribution system and the auxiliary pumps used.

A section of deck with a portion of hatch coaming in place is to starboard aft of the deckhouse area. Further aft, the starboard side has collapsed toward the reef. At least one and possibly two holds were in the stern aft of the superstructure. No shaft alley was observed in the bottom of the hold area. It is not clear what the arrangement of the shaft and its surrounding structure was in this vessel. The alley structure was probably removed by salvors if they recovered the shaft and screw.

The steering quadrant is presently 460 feet from the bow (Figure 9.66). The steering engine is a dual-piston engine that moved the rudder by rotating the quadrant along a semicircular toothed track, which is still in place.

The rudder head is located aft of the steering quadrant and appears to be turned 180 degrees from normal. The rudder is buried and the screw boss plate, if it remains, and other stern features are not visible.

Historical documentation indicates the vessel remained in view for a period, with the superstructure and stern exposed. Photographs show the bow submerged and the forward kingposts canted at opposite angles, a result of serious structural damage to the hull aft of the bow. The stem and deep-floor section were separated from the hull, and the forefoot of the stem post and forward section of keel were torn off the bow. This probably occurred as a result of the pivoting of the bow after it was hard aground, evidently at or near its present

location. The vessel sank, and the bow separated and came to rest on the port side, while the rest of the hull settled on an even keel. The damage between the bow and machinery room bulkheads reflects the extensive impact of a torpedo reported to have struck the vessel. Despite these impacts, the site is substantially intact, and the remaining structure has both historical importance and archeological research potential.

Administrative Status

Sites located both within Apra Harbor and immediately outside the harbor mouth are on submerged lands under the jurisdiction of the U.S. Navy. This includes CORMORAN, KITSUGAWA MARU, TOKAI MARU and NICHiyU MARU. ARATAMA MARU is on lands under the jurisdiction of the Government of Guam.

On April 4, 1975, CORMORAN was listed in the National Register of Historic Places. The Navy nominated TOKAI MARU to the National Register of Historic Places in cooperation with the Guam State Historic Preservation Office; it was accepted on the National Register on July 14, 1988. Also, in 1988 the U.S. Navy placed a mooring buoy over both ships for scuba divers.

ARATAMA MARU was accepted to the National Register of Historic Places on June 2, 1988.

Present Threats and Impacts

Active sport diving on all sites around Guam is a potential threat. Although efforts have been and continue to be made to preserve sites, depredation since the 1960s has resulted in the removal of most portable artifacts as well as brass fittings, instruments, gauges, etc. Today the heaviest impact is diver visitation; the numbers of divers touching, bumping up against, and handling features remaining on the sites will accelerate their deterioration.

Caroline Islands

Shipwreck investigations were undertaken on the islands of Belau and Kosrae. The sites at Belau lie within Ngemelachel (Malakal) Harbor, Ngeruktabel (Urukthapel) Anchorage, the channel to Kobisang Harbor, and Chelbacheb (the Rock Islands). The site investigated in Kosrae lies within Port Lottin near the village of Utwa.



Fig. 9.65. Hold stanchions forward of the machinery space.
(NPS photo by Ken Vrana)

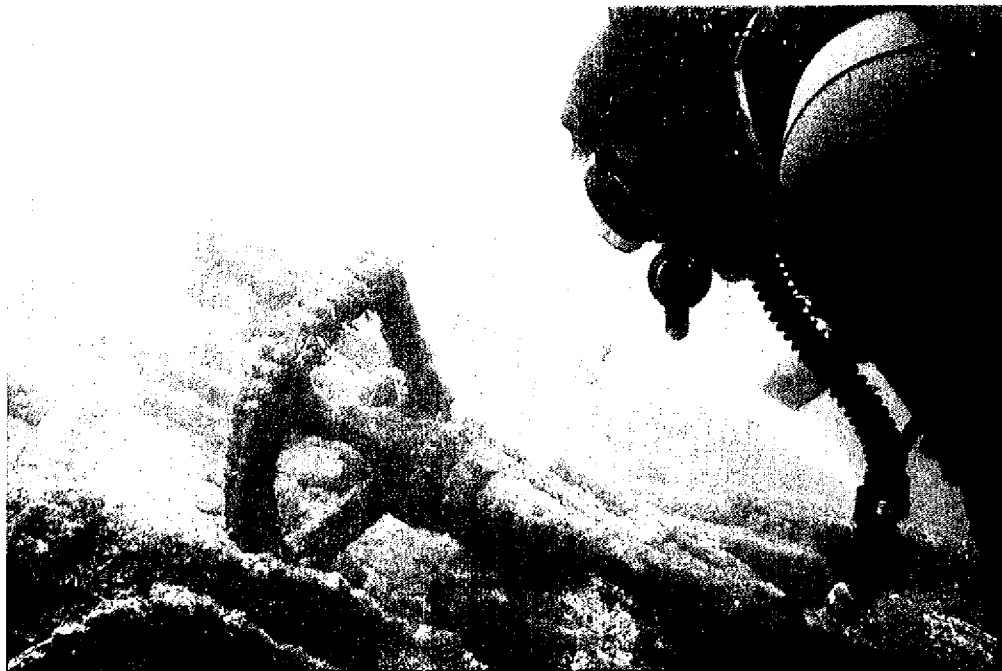


Fig. 9.66. Steering quadrant in the stern. (NPS photo by
Dan Lenihan)

Republic of Belau¹³

From April 11 to June 17, 1988, archeologists from the SCRU, NPS, supervised field operations aimed at identifying significant underwater archeological sites. The project director was Daniel Lenihan and the assistant project director was Toni Carrell. This operation was requested by and heavily supported by the Belau Office of Historic Preservation. Mr. Moses Sam, and later Ms. Vicky Kanai, were primary points of contact. The U.S. Navy enhanced the effectiveness of this project by providing personnel and heavy equipment for the research in the context of active duty training for U.S. Navy Reserves attached to Mobile Diving and Salvage Unit (MDSU) One, Pearl Harbor. Primary Navy coordinators were Comdr. David McCampbell, Commanding Officer MDSU One in Honolulu, and Reserve Comdr. James "Otto" Orzech from Solana Beach, California (Figures 9.68, 9.69 and 9.70). During the course of field operations, five ships were mapped with Navy assistance, three others were briefly examined, and a sketch map was begun on another.

Site selection was based, in part, upon accessibility and type; the aim was to look at a variety of site types in a number of locations in order to gain a broad understanding of the potential resource base. Only previously discovered sites were documented.

Site-Specific Investigations

Nearly 80 ships are known to have wrecked in the islands of Belau. They span nearly three centuries of exploration, whaling, trading and war. They are also spread from the southernmost island at Helen's Reef to the northernmost at Ngeruangel. The earliest reported loss in the islands was that of a patache in 1709 while it was attempting to reconnoiter the "Palaos" islands (Driver 1988:2). One of the most famous of the early wrecks in Belau is that of the British East India Company ship, ANTELOPE. Captained by Henry Wilson, ANTELOPE ran aground on a reef near Ulong Island in 1783. This encounter between European and Belauan forever changed the islands' future.

The most numerous wrecks are those that date from the Japanese occupation of the islands during World War II (Figure 9.67). Some 66 ships are known to have been sunk as

¹³The section on the Republic of Belau was written by Toni L. Carrell.



Fig. 9.67. Several Japanese transports and other vessels lie in the deeper portion of the lagoon at depths of approximately 100 feet. (NPS photo by Dan Lenihan)



Fig. 9.68. The U.S. Navy provided personnel services and assets to the 1988 survey as a part of Project SeaMark. Barge being used as staging platform for surface-supplied divers. (NPS Photo by Dan Lenihan)

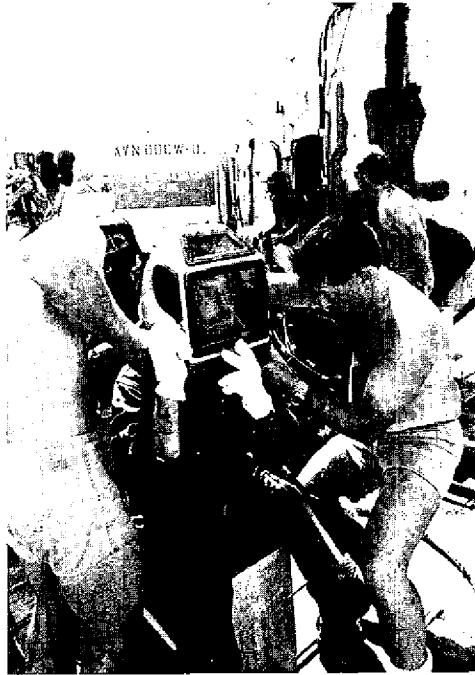


Fig. 9.69. Mobile Diving Salvage Unit One used the project for active duty training of Naval Reserve divers. (NPS photo by Dan Lenihan)

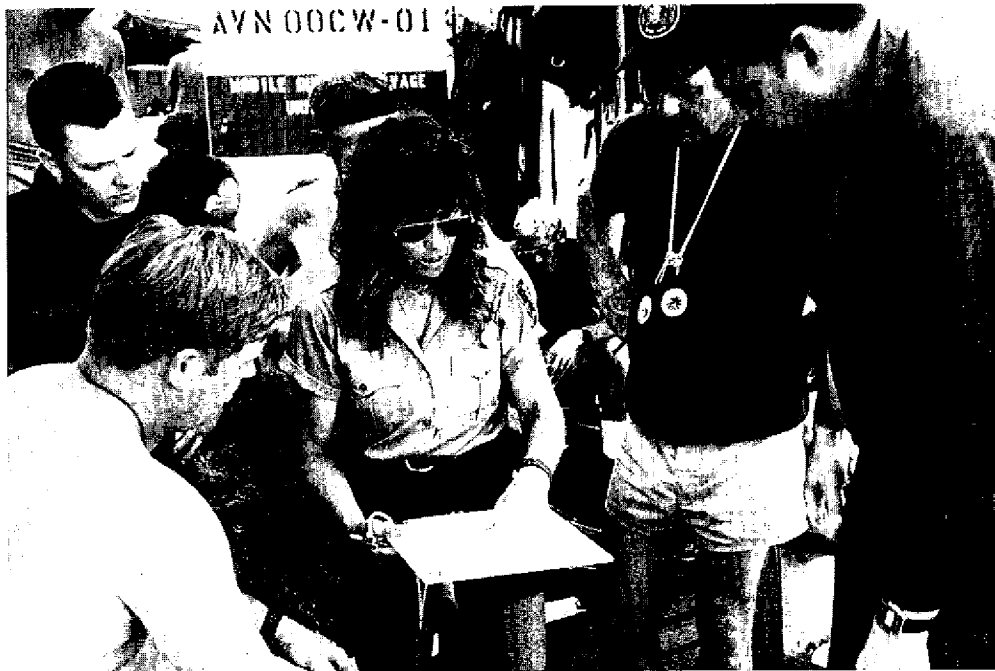


Fig. 9.70. Toni Carrell working with Navy dive team. (NPS photo by Dan Lenihan)

a result of aerial bombing attacks. Along with those are four American ships lost during the battle for Belilieu.

Of these many sites, it was possible to completely document only five and to briefly visit three others, which are reported on in this chapter. They include AMATSU MARU, T.1, RYUKO MARU, RAIZAN MARU, SATA, IRO, NAGISAN MARU, KAMIKAZE MARU, an unidentified merchant ship and an unidentified small motor torpedo boat or submarine chaser.

AMATSU MARU (B:OR-13:UR:01)

AMATSU MARU, a Japanese tanker, is lying in the northwestern corner of Ngemelachel Harbor (Malakal Harbor) (Figure 9.71). This ship was erroneously identified as SATA by local divers; it has also been called SATA MARU; both designations are incorrect. Field examination and documentation confirmed its identification as AMATSU MARU. Documents received from Fujita Salvage,¹⁴ the Japanese company that salvaged many of the ships in Belau in the early 1960s, corroborates the identification of this ship and its location. The ship was accurately located by Fujita at 7°20'10" north, 134°26'23" east.

Historical Background

This ship is a Standard 1TL Type Tanker, built in Japan by Nagasaki Shipyard.¹⁵ The keel was laid on November 8, 1942, and the ship was delivered to owners Isihara Kisen on June 10, 1943. The ship's registration number was 50239. Its gross tonnage was 10,567 tons, and its capacity was 17,162 cubic meters. Constructed of steel, it is 526 feet, 7 inches (160.50 meters) long overall; 502 feet (153 meters) between perpendiculars; 65 feet, 7 inches (20 meters) in breadth; 37 feet, 8 inches (11.50 meters) in depth of hold, and has a draft of 31 feet 5 inches (9.60 meters), loaded. Its turbine engine could produce 8,600 horsepower and run at 15 knots.

¹⁴ In August 1988, Mr. Fujita of Fujita Salvage generously provided copies of documents on the location, condition and suitability of salvage for 37 ships in Belau. Mr. Paul Lacke of Tokyo Friendship was instrumental in obtaining these documents.

¹⁵ Information on the historic description and miscellaneous particulars for AMATSU MARU is based upon documents generously provided by Dr. Sanae Yamada. Translation was done by Taka Inoue.

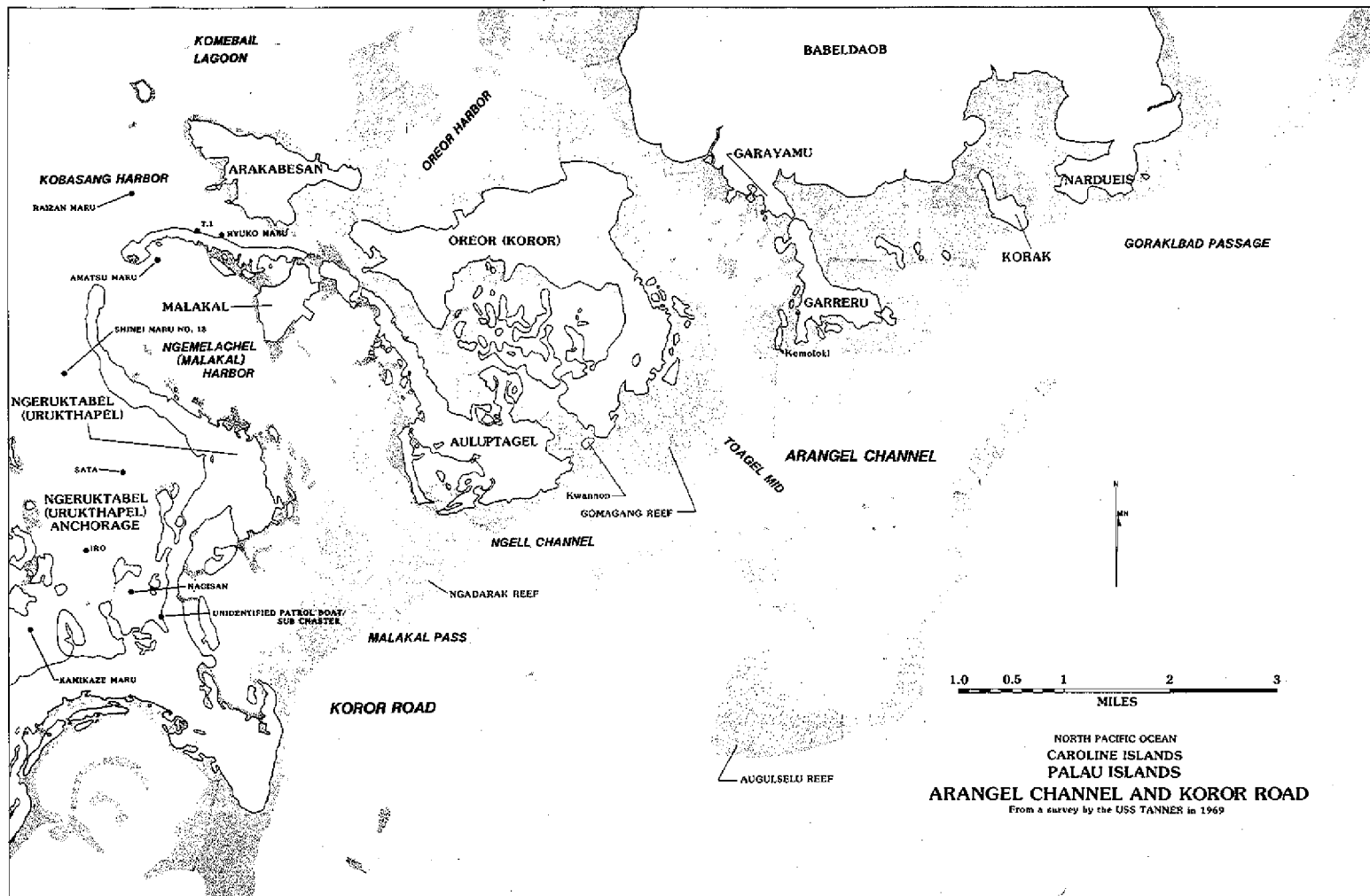


Fig. 9.71. Locations of AMATSU MARU, NAGISAN, SATA, IRO, SHINSEI #18, GOZAN, RAISAN, T.1 and RYUKO.

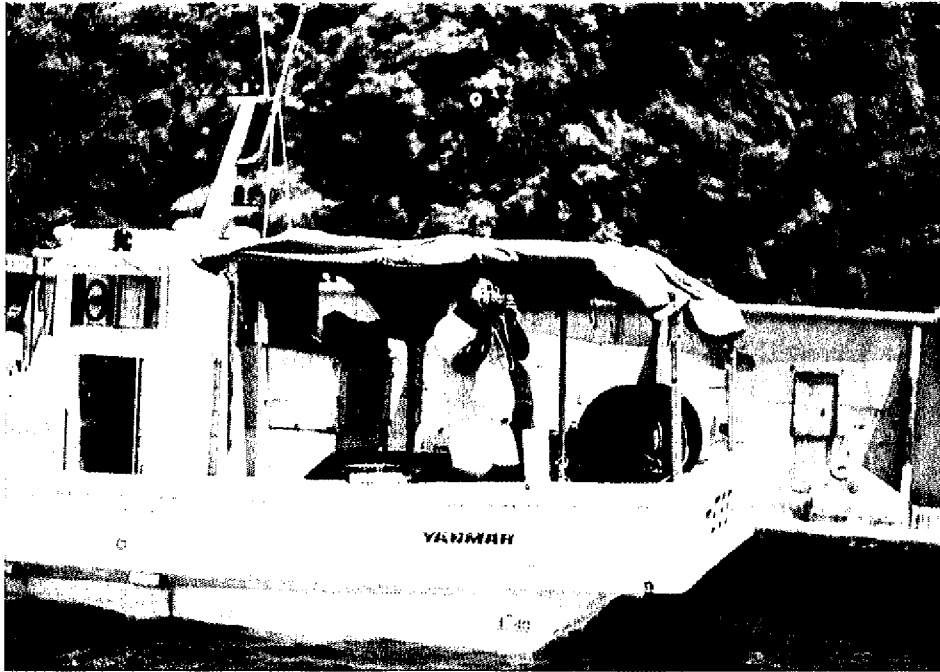


Fig. 9.72. Historic Preservation Office Cultural Resources Specialist Vince Blaiyok positions wreck site with a horizontal sextant. (NPS photo by Dan Lenihan)



Fig. 9.73. Efforts were made to train Belauans in the use of many of the recording tools. Historic Preservation Office diver David Orak videotapes Navy divers on AMATSU MARU. (NPS photo by Dan Lenihan)

AMATSU MARU carried a complement of 65 and was considered a first-class ship of the Communication Department in Ocean District. The tanker has a split superstructure, with the bridge just forward of amidships, the engines aft, and a single funnel (Figure 9.74). It is well-decked, has a raked bow, counter stern, single screw and unbalanced rudder. The standard class tankers, represented by this ship, are similar in construction to their prewar counterparts and were intended to be economical vessels for postwar use.

The tanker was attacked by planes from Task Force 58 on March 30, 1944. After a fire and explosion in the engine room, AMATSU MARU quickly sank (Figure 9.75).

Present Description and Analysis

AMATSU MARU is sitting upright in 100 to 130 feet of water on a sand/silt bottom. This ship is substantially intact, and the damage area is generally confined to the stern machinery space (Figure 9.76).

The bow is undamaged and, with the exception of the missing anchor winch probably salvaged in the 1960s, is little changed from its wartime configuration. The only evidence of the winch location are the bed plate and the breaks. Anchor chain lies piled up on the forecastle deck and threads past bits down into the chain locker via a hole in the deck (Figure 9.77). Surprisingly, no chain runs through the heavily reinforced hawseholes on the deck (Figure 9.78). No evidence of the anchors remains; they were most likely salvaged along with the winch and most of the chain.

Two ladders, one each on port and starboard, lead from the forecastle to the main deck (Figure 9.79). Doorways lead into the forecastle. Five expansion tanks (openings) are present on the forward well deck (Figure 9.80). Numerous longitudinal pipes and valves for handling the cargo of fuel run from the forecastle aft to the bridge (Figures 9.81 and 9.82). Two ladders again lead from the well deck up to the bridge.

The bridge and deckhouse are amidships (refer to Figure 9.76). The structure is intact; however, the wooden decking as well as all interior equipment have been salvaged (Figure 9.83). Loose wiring and a urinal remain in the upper deck, and loose wiring is visible on the second deck. An open rail rings the pilothouse roof; an expansion tank lid is lying on the framing.

Immediately aft of the bridge, two catwalks are present, both at the level of the upper deck (Figure 9.84). The larger, to

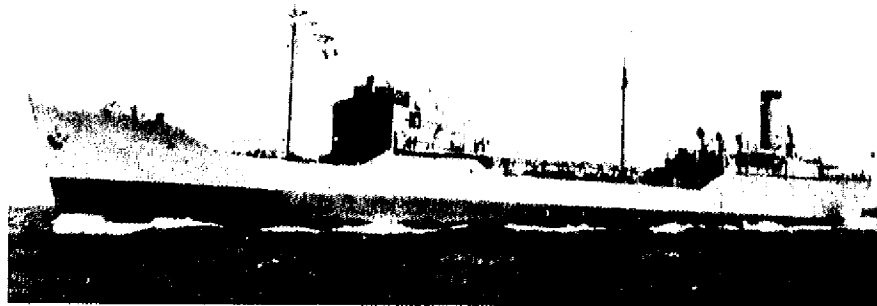


Fig. 9.74. Historic photograph of AMATSU MARU. (Photo courtesy of Dr. Sanae Yamada)



Fig. 9.75. AMATSU MARU burning after U.S. aerial bombing attack on March 30, 1944. (Photo courtesy of National Archives)

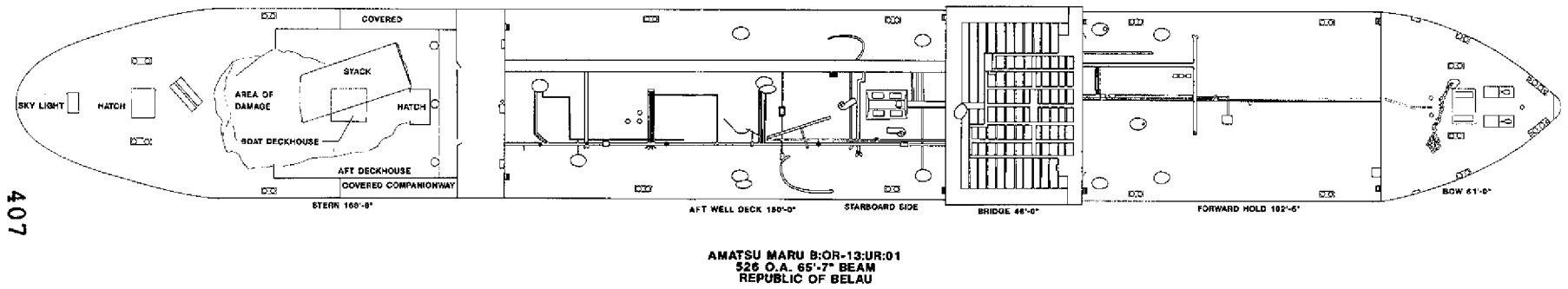


Fig. 9.76. Base map of AMATSU MARU, sunk in Belau, March 1944.

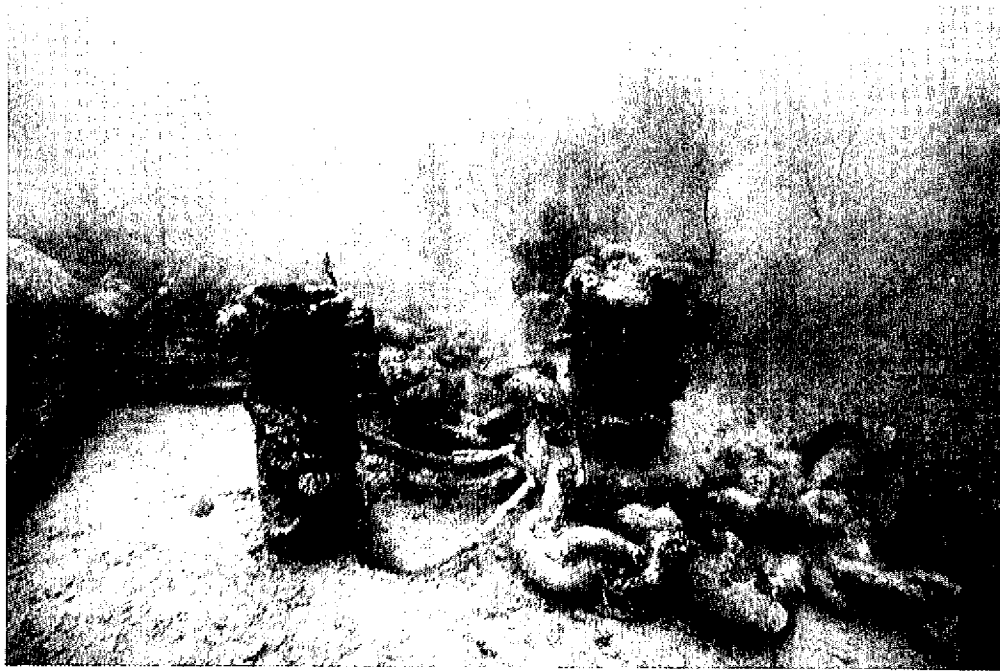


Fig. 9.77. Anchor chain is still present on the bow of AMATSU MARU. (NPS photo by Toni Carrell)

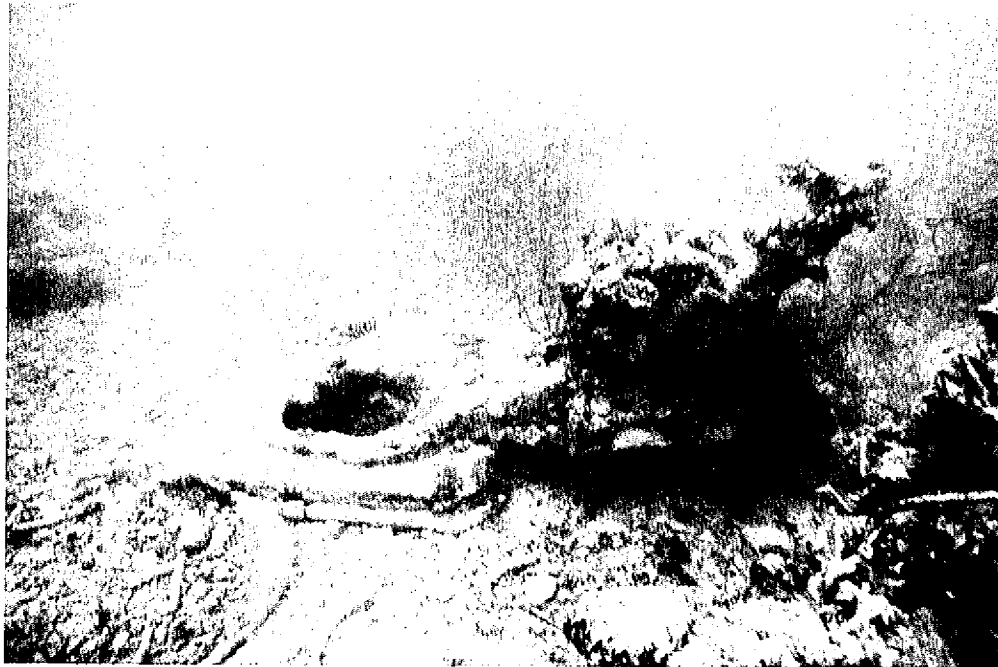


Fig. 9.78. Hawsehole and chain break in the forecastle deck. (NPS photo by Toni Carrell)

port of centerline, extends the full length of the aft well deck and terminates in the stern just forward of the deckhouse and machinery space (refer to Figure 9.76). The second, on centerline, leads to a small pumphouse approximately 15 feet aft of the bridge (Figure 9.85). Intact, the pumphouse door is open and it is possible to enter. The skylights on the roof of the pumphouse are in place and slightly open (Figure 9.86).

Two disarticulated ventilators lie on the deck near the pumphouse, one a few feet from the pumphouse door and a second starboard of the structure on the deck. Transverse and longitudinal piping is present on the aft well deck. Seven expansion tanks are present on the aft well deck (refer to Figure 9.76). The deck has buckled inward approximately 80 feet aft of the bridge, which resulted in a break in one of the main longitudinal pipes. Smaller pipes are scattered about, but overall damage in this area is minimal. Two heavy segments of hose lie on the deck, one on the port side and a second on the starboard. Ladders lead from the well deck up to the stern deckhouse.

The upper deck in the stern is also buckled, and the roof of the aft deckhouse is collapsed inward. Engine room intakes are standing, although damaged. The funnel lies to port atop the deckhouse framing. A smaller deckhouse, possibly stern steering, is outlined and partially visible beneath the slightly flattened funnel. The damage area extends beyond the end of the stern machinery space and deckhouse with a large area of stern deck destroyed. The Japanese salvage documents simply state "... completely sunk, fire in engine room" (unpublished documents in possession of author). A photograph taken during the aerial attack in 1944 confirms that the damage visible to the machinery space was caused by bombing and not by later postwar salvage (refer to Figure 9.75). Boat davits are present on either side of the aft deckhouse. The area is heavily overgrown with wire corals and sponges.

There is some buckling of the deck plating aft of the immediate damage area, although the stern does retain good integrity and the counter is intact. Examination of the stern revealed that the single propeller was not salvaged.

The combination of archeological evidence, historic photographs and Japanese documents leaves no doubt that this site is the remains of AMATSU MARU.

T.1 (B:OR-13:UR:02)

The fast transport, T.1, is lying on the north side of Ngerchaol (Ngargol) Island (refer to Figure 9.71). Although



Fig. 9.79. Ladders lead from the forecastle to the main deck. (NPS photo by Toni Carrell)



Fig. 9.80. Five raised expansion tanks are present on the forward well deck, two of which retain their covers. (NPS photo by Toni Carrell)

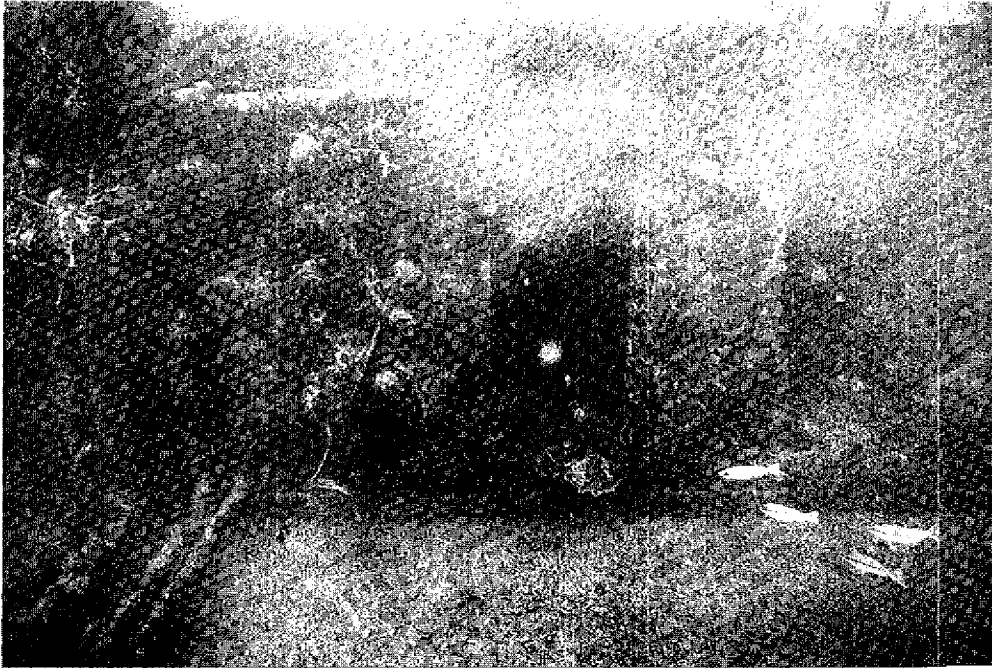


Fig. 9.81. Piping runs from the forecastle aft to the bridge. Doorways still permit entry to the intact forecastle. (NPS photo by Toni Carrell)



Fig. 9.82. Longitudinal piping, u-shaped expansion joint and valve on the forward well deck. (NPS photo by Toni Carrell)

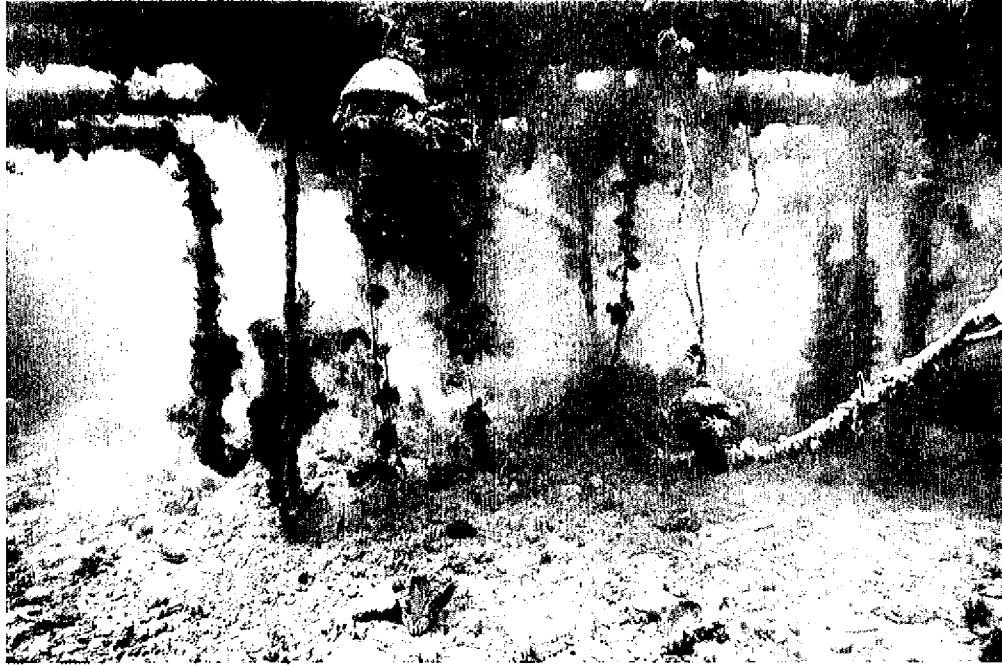


Fig. 9.83. Interior of deckhouse on AMATSU MARU. (NPS photo by Toni Carrell)

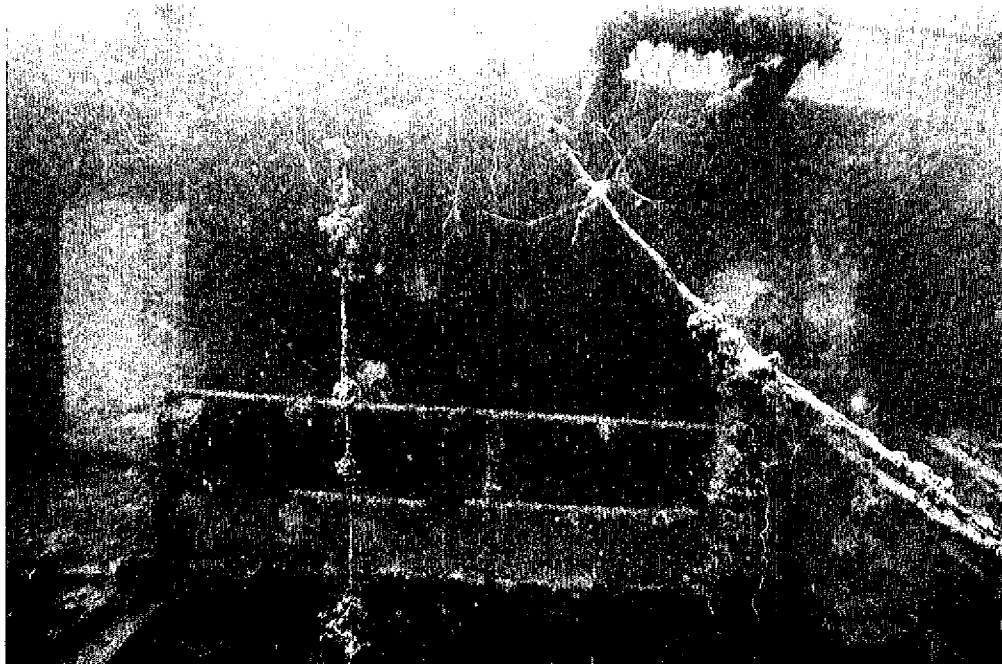


Fig. 9.84. Aft of the intact bridge are two catwalks (lower left and lower right) that lead to the stern and a small pumphouse. (NPS photo by Toni Carrell)



Fig. 9.85. The intact pumphouse is 15 feet behind the bridge on the aft well deck. (NPS photo by Toni Carrell)

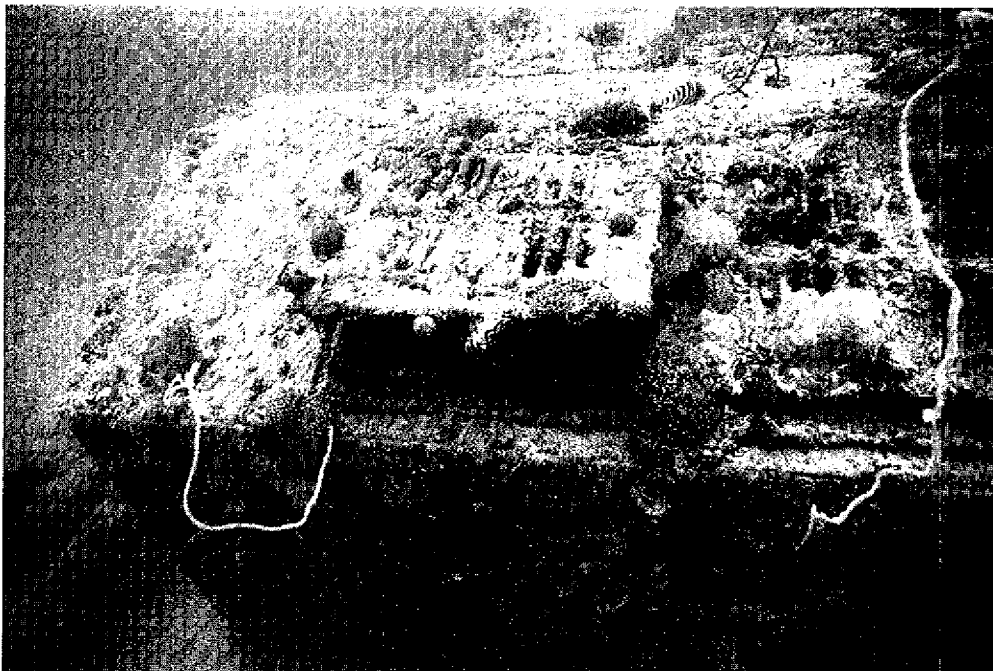


Fig. 9.86. The pumphouse skylights are still intact and partially open. (NPS photo by Toni Carrell)

it was misidentified as an armed cargo ship that was reported to have been covered with camouflage paint, field examination and documentation confirmed its identification as a T.1 Class, armed, fast attack transport.

Historical Background

The T.1 Class ships were constructed by Kure Dockyard and Mitsubishi, Yokohama, under the 1943 war program. They were fast and heavily armed transports designed to carry landing craft, amphibious tanks or midget submarines. Their construction was simple with a welded, flush-decked hull and no sheer or tumble home (Figure 9.87). According to Jentschura, Jung and Mickel the sections were assembled at Kure and construction took 3 to 6 months (1977:226). They could carry four Daihatsu landing craft, which were launched over the stern by using rollers. Alternative cargos were 7 Type 2 amphibious tanks and 220 tons of cargo, or 2 Koryu midget submarines and 184 tons of cargo, or 6 Kaiten human torpedoes and 243 tons of cargo, or 450 to 500 tons of cargo and 480 marines.

The T.1 Class transports were 315 feet long overall, had a 33-foot, 6-inch beam, and 11-foot, 9-1/2-inch draft, light. The ship in Belau, the namesake of the class, was completed May 10, 1944. It was armed with 42 depth charges; two 5-inch, 40-caliber antiaircraft guns; and 15 25-mm antiaircraft guns.

T.1 was still under construction during the March 1944 raids that claimed so many ships. It did not arrive at the islands until June or July and was sunk on July 27 by aircraft from Task Force 58 during the invasion of Beliliou.

Present Description

T.1 is severely damaged and lies on a rocky slope near the end of Ngerkebesant (Kobesang) Channel in 70 to 100 feet of water. The ship has a welded, flush-decked hull, composite superstructure with a single funnel aft. The ship is in three sections, the smallest is the bow, sitting slightly angled to the slope on the starboard side. The 23-foot-long bow piece is disarticulated aft of the upright capstan.

The second section of ship, aft of the capstan to the machinery space, is lying nearly upside down. The bridge is flattened under the hull; however, both triple and double-mount antiaircraft machine guns are visible on the upslope side of the ship (Figure 9.88). In addition, both of the 5-inch, 40-caliber antiaircraft guns are visible on this same side (Figure 9.89).

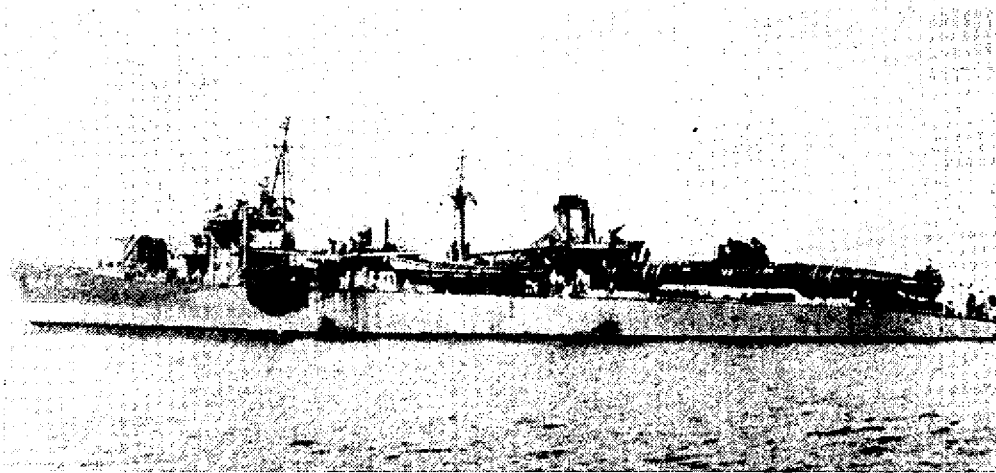


Fig. 9.87. The T.1 fast transports were designed to carry landing craft and amphibious tanks or midget submarines. (Photo courtesy of U.S. Naval Institute Press)



Fig. 9.88. Fifteen-inch, 25-mm, antiaircraft guns on T.1. (NPS photo by Toni Carrell)

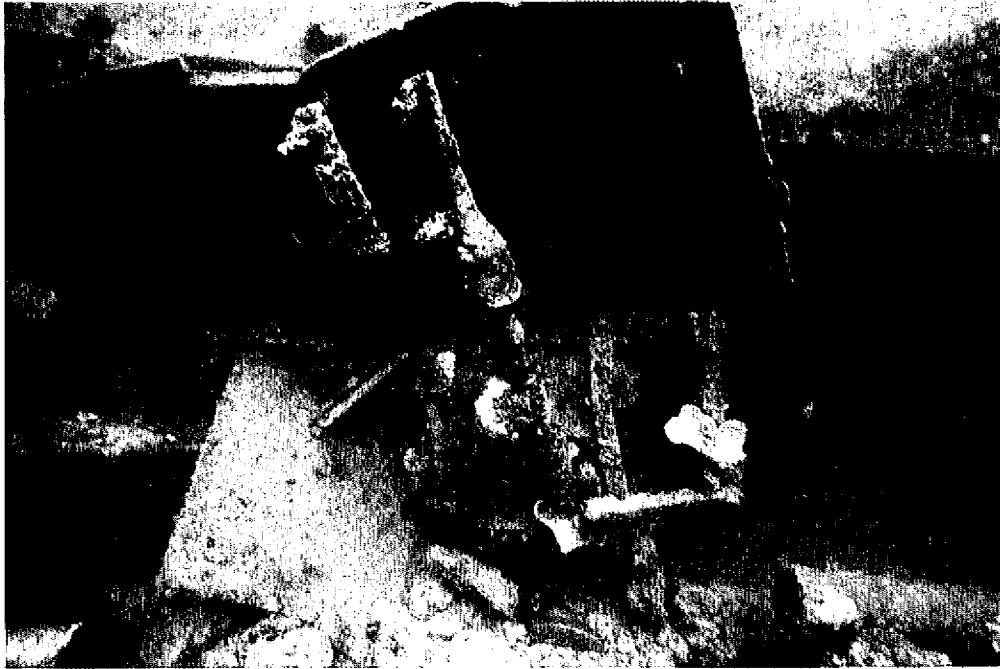
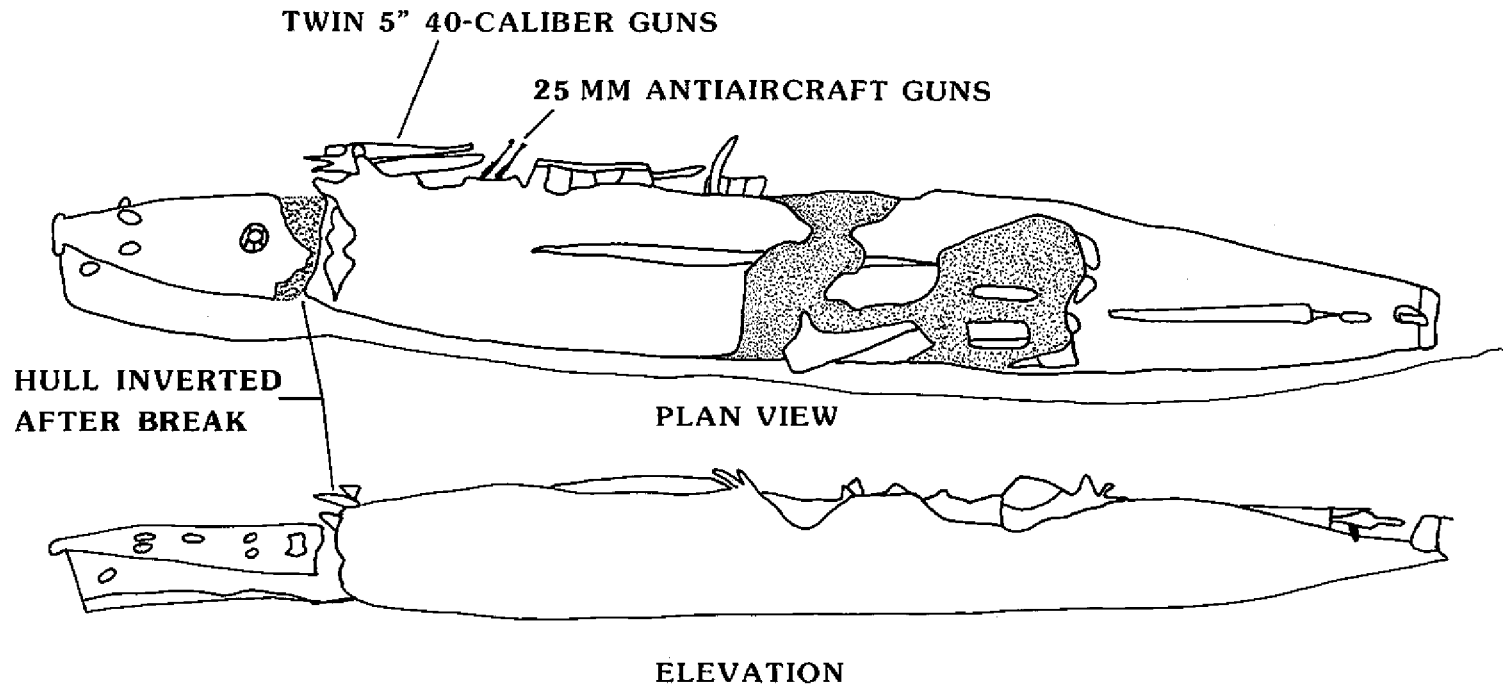


Fig. 9.89. Twin 5-inch, 40-caliber, antiaircraft machine guns on T.1. (NPS photo by Toni Carrell)



Fig. 9.90. The badly damaged midships machinery space on T.1. (NPS photo by Toni Carrell)



417

Fig. 9.91. T.1 type landing ship (transport). Rough sketch by Kevin Foster.

The midship machinery space has been blown open and badly damaged (Figure 9.90). The boiler tubes and mud drums of the two boilers are present and identifiable. However, the geared turbine engine is not readily visible (Figure 9.91).

Aft of the machinery space, the ship's bottom is completely upside down. The bottom (of the hull), the keel, shaft, and rudder are clearly exposed. The single screw is missing and is assumed to have been salvaged; the rudder and shaft are undamaged. The stern is intact and is an identifying feature of the wreck. Looking up underneath the ship, one sees that the deck slopes gently down to the water line, and a number of rails and rollers are attached to the deck to facilitate the launching of landing craft.

RYUKO MARU (B:OR-13:UR:03)

RYUKO MARU, a Standard 1C Type Merchant Ship, is east of T.1 on the north side of Ngerchaol (Ngarol) Island (refer to Figure 9.71). This ship was erroneously identified as KAMIKAZE MARU. Field examination and documentation confirmed its identification as a Standard 1C Type Merchant ship. It was not until documents received from Fujita Salvage,¹⁶ the Japanese company that salvaged many of the ships in Belau in the early 1960s, were translated that positive identification of this ship, as well as its two sisters, could be confirmed.

Historical Background

Three vessels of this class were sunk in Belau: SHINSEI MARU No. 18, RYUKO MARU, and RAIZAN MARU. SHINSEI and RYUKO were completed in 1941 and 1942, while RAIZAN was finished in 1943. These ships were built as part of the war standard construction program. Private shipyards provided the basic designs, which were modified to accommodate mass production. All of the Type 1C ships were completed under the first war standard program (Jentschura, Jung and Mickel 1977:255), were similar to their peacetime counterparts, and were intended to be economical vessels for postwar use. Twenty-five Type 1C ships were construction by various builders (Figure 9.92). Each is 321 feet long overall; 44 feet, 11 inches, at beam; and 20 feet, 10 inches, in draft.

¹⁶Unpublished documents provided by Mr. Fujita of Fujita Salvage on the location, condition and suitability of salvage for 37 ships in Belau.

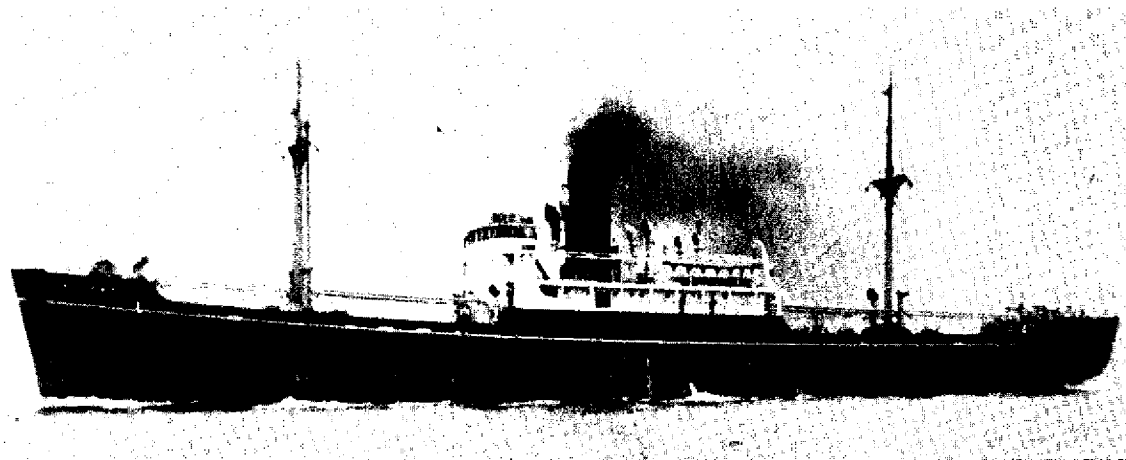


Fig. 9.92. Historic photograph of SHINSEI MARU No. 18, sister ship to RYUKO MARU. Three standard 1C type merchant ships were sunk in Belau, SHINSEI MARU No. 18, SYUKO MARU and RAIZAN MARU. (Photo courtesy of Dr. Sanae Yamada)

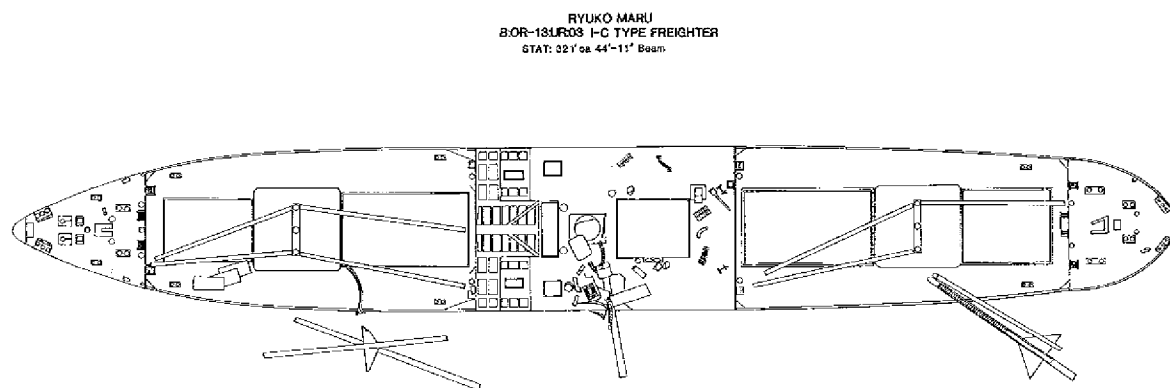


Fig. 9.93. Line drawing of 1C freighter sunk in Belau, March 1944, possibly RYUKO MARU.

Tsurumi Shipyard launched RYUKO MARU on December 18, 1941, and delivered it to owners Taiyo Kogyo the following year.¹⁷ The ship's port of registry was Kobe, and it was assigned registration number 48986 and call letters JDHR. The cargo steamer's vertical, triple-expansion engine could generate 1800 indicated horsepower (ihp) and could make a maximum speed of 14 knots. The three sister ships were sunk on March 30, 1944, by aircraft from Task Force 58.

Present Description and Analysis

The ship is sitting upright on a sand and silt bottom in 80 feet (to the deck) to 100 feet (to the bottom) in the channel leading to Kobesang Harbor (refer to Figure 9.71). The ship is substantially intact, with damage confined to the midships area. The merchant ship has a composite superstructure, well-decked, raked bow, cruiser/spoon stern, and a single medium funnel amidships (refer to Figure 9.92).

The forecastle is intact and, with the exception of the missing windlass, is undamaged (Figure 9.93). The only evidence of the location of the windlass is the bedplate. Chain brakes are present directly aft of the hawseholes on the deck. Hull inspection by U.S. Navy divers on both the port and starboard sides revealed that there was no damage to the hull in the bow area and that anchor chain runs out the hawse pipe on the starboard side and into the sand and silt bottom. The forecastle is ringed by an open rail, and at the aft bulkhead two small boom winches are present. Fairleads, bollards, mooring bits and ventilators complete the forecastle.

Ladders on port and starboard lead from the forecastle to the main deck and holds 1 and 2. The holds are separated by an intact winch house. Hold Number 1 is considerably smaller and narrower than hold 2, an accommodation for the narrowness of the bow. Only the base of the single forward mast remains on the winch house. The mast itself is lying on the bottom in 100 feet of water on the port side of the ship. Heavy wire rope snakes its way over the gunnel toward the mast. The crosstree and topmast are both present.

All four forward cargo booms are still attached to their stout boom masts that also serve as ventilators. The booms for hold Number 1 are lying together, to port, on the hatch

¹⁷ Information on the historic description and miscellaneous particulars for this ship is based upon documents provided by Dr. Sanae Yamada.

coaming. The booms for hold Number 2 are lying on the hatch coaming, the loose end of the starboard boom dropping slightly into the hold. The four small boom winches, two forward and two aft, are present on the deck at the forecastle bulkhead and at the midships deckhouse bulkhead, respectively. Three large steel plates lie on the deck on the port side of hold Number 1. Inspection of the two forward holds found no cargo. The four forward mooring bits are on the deck.

Ladders lead from the well deck into the second level of the superstructure, which is three decks high. On the port side the ventilator funnel is broken off and lies on the ladder. Doors at the deck level are open, and it is possible to enter the deckhouse here. The bridge is intact, although only the metal framework remains. All bridge instruments have been stripped from the site.

The machinery space, immediately aft of the bridge, shows extensive damage. The funnel is off to port, and the port side has been blown outward. Inspection of the starboard side revealed evidence of an inward puncture of the hull at or just below the level of the water line. Presumably, the damage is from the skip bomb that sank the ship. The engine room skylight is located immediately behind the bridge. Only the bases to the large intakes for the engine are standing. The small hold in the midships area was for coal to fuel the triple-expansion engine. Preliminary inspection in this area did not reveal the presence of any coal. Massive coral growth and limited visibility hampered mapping in this area. Engine room grating and miscellaneous debris are scattered across the deck. A very small deckhouse, presumably the radio room, is located on the starboard stern corner of the coal hatch. Two small, hand-operated winches are on this deck aft of the coal hatch. The cowlings to four ventilators are also scattered about.

Ladders once again lead down from the machinery deck to the well deck in the stern. Aft of the machinery space, the ship shows little damage. The holds are intact and devoid of cargo. The booms are present and articulated to their posts with only the port boom for hold Number 4 broken off. It lies over the port gunnel with the end in the silty bottom. The aft mast is broken off and lying adjacent to the boom. A ladder runs up the mast to just below its intact crosstree.

Two short ladders, located on centerline, lead from the well deck up to the poop. The raised poop is undamaged, although the stern windlass is also missing. Two boom winches are present on the deck.

Inspection of the stern showed that the plates around the shaft were buckled, presumably during postwar salvage. The rudder was removed and is lying a short distance from the stern. The propeller shaft is slightly damaged, and the propeller is gone.

RAIZAN MARU (B:OR-13:UR:05)

This ship was erroneously described as intact and fully laden with cargo. Locally called the "Hotel Wreck," it is located approximately 1 nautical mile from the Palau Pacific Resort out in the deep water of Kobesang Harbor (refer to Figure 9.71).

It was not until documents received from Fujita Salvage,¹⁸ the Japanese company that salvaged many of the ships in Belau in the early 1960s, were translated that positive identification of this ship, as well as its two sisters, RYUKO MARU and SHINSEI MARU No. 18, could be confirmed. The ship was located by Fujita at 7°20'50" north, 134°26'12" east (unpublished documents in possession of author). Further corroboration from these documents is the depth in which this ship, and its sisters, were lost. RAIZAN MARU was reported sunk in 34 to 38 meters of water, that is, 111 to 124 feet of water. That matches almost exactly with the depths recorded, 110-130 feet, from the brief reconnaissance dive conducted on the site.

Historical Background

RAIZAN MARU, a Standard 1C Type Merchant Ship, was built by the Namihaya Dockyard in Osaka during the first war program.¹⁹ It was launched in July 1942, completed later that year, and registered as number 49073 at the port of Wakamatsu. The owners were Tsurumaru Kisen. Like its sisters, the steel-hulled ship was used as a cargo transport during the war. It was sunk on March 30, 1944, by aircraft from Task Force 58.

¹⁸ Unpublished documents provided by Mr. Fujita of Fujita Salvage on the location, condition and suitability of salvage for 37 ships in Belau.

¹⁹ Information on the historic description and miscellaneous particulars for this ship is based on documents provided by Dr. Sanae Yamada.

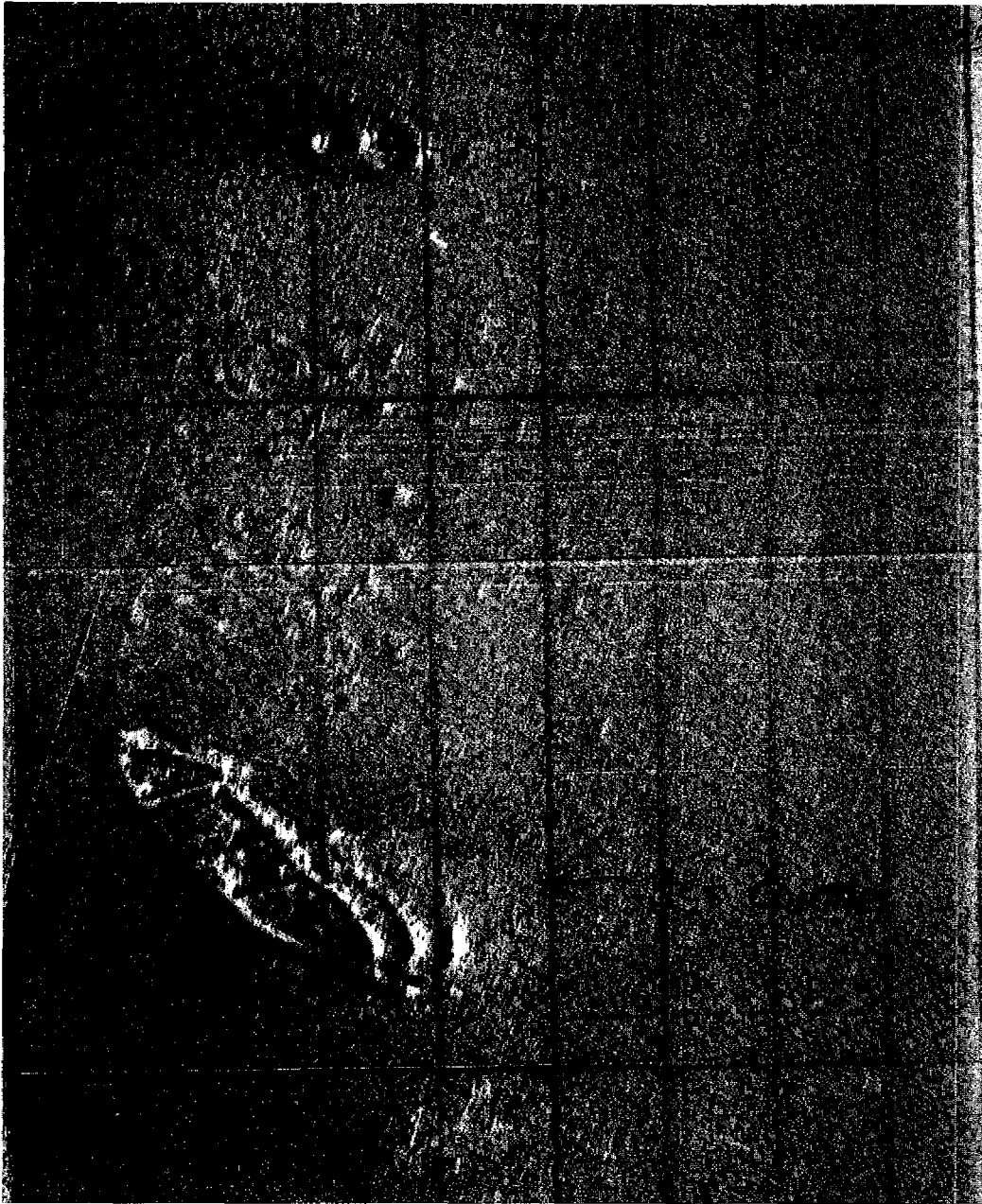


Fig. 9.94. Side scan image of what appear to be the remains of RAIZAN MARU, sister ship to RYUKO MARU and SHINSEI MARU No. 18.

Present Description and Analysis

Although badly damaged, the side scan image obtained during the joint NPS-USN operations in May 1988 clearly shows that the bottom and sides of the ship remain (Figure 9.94). A brief reconnaissance dive on the site revealed that the raised poop on the stern is recognizable and frames are exposed on the starboard side. The ship's 10-inch shaft is in place; however, the rudder and propeller are missing. Deck or hatch cover beams lie in the area of holds 3 and 4, aft of the machinery space, along with a ladder and several 55-gallon drums. The superstructure in the machinery space is collapsed. Broken pipe and sections of catwalk are visible.

It appears that the ship had two holds forward; all traces of the winch houses and masts are gone. The break between the forecastle and forward holds is discernible by the presence of the bulkhead. Very little remains of the forecastle. The stem is visible and the bow is recognizable. Little damage was observed on the port side of the ship. Follow-up on this site is recommended to clarify the identification and documentation of remains.

IRO (B:OR-15:UR:01)

IRO, a Japanese oiler and sister ship to SATA, is located in the southern portion of Ngeruktabel (Urukthapel) Anchorage (refer to Figure 9.71).

Historical Background

A total of 10 Shiretoko Class oilers was constructed between 1920 and 1923. Five different builders contracted to build these large ships. IRO was launched on August 5, 1922, and completed on October 13 at Osaka Iron Works. These oilers were designed with a split superstructure, bridge amidships, and engine room aft. The ship has a raised forecastle, a well deck fore and aft of the bridge, raised machinery space, a short well deck in the stern and a raised poop (Figure 9.95). These oilers were equipped for replenishment at sea with athwartships fueling pipes mounted on kingposts.

The Shiretoko class oilers are 470 feet, 8 inches, long at the water line, 57 feet long at the beam, and 26 feet, 6 inches, in draft. All have a plumb bow, counter stern and single screw. IRO was rated at 15,450 net registered tons and carried a vertical, triple-expansion engine and four boilers. It was reboilered between 1928 and 1932 with four Kampon Type "Ro" boilers. The engine could make 14 knots at an indicated horsepower of 5,500. This class used either coal or oil for fuel.

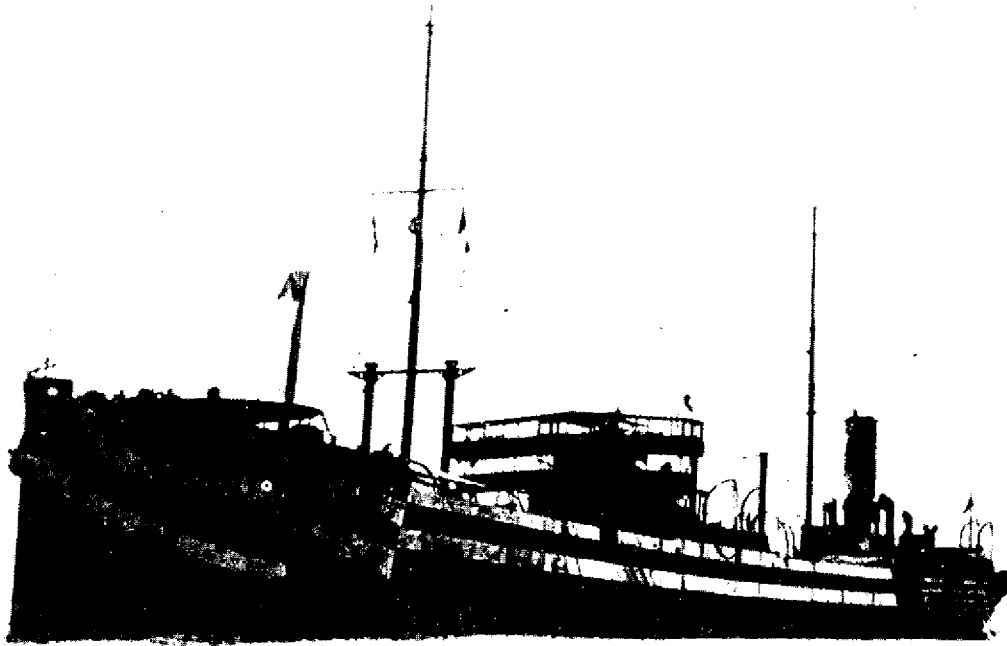


Fig. 9.95. Historic photograph of the Shiretoko class oiler IRO. (Photo courtesy of Dr. Sanae Yamada)



Fig. 9.96. IRO is shown burning after the aerial bombing attack on March 30, 1944. (Photo courtesy of National Archives)

IRO was armed with two 140-mm (5.51-inch); 50-caliber, low-angle guns; and two 80-mm high-angle guns. In 1940, the 140-mm guns were replaced with two 80-mm, 40-caliber, high-angle guns and four 13.2-mm antiaircraft guns were added. The ship was rated to carry a crew of 160.

On March 30, 1944, the ship was at anchor in Ngeruktabel (Urukthapel) Anchorage. Given the importance of these ships in the overall war effort, it is difficult to understand why IRO remained in the anchorage following the standard reconnaissance flights just prior to the aerial attack. The records of submarine attacks provide some insight. According to those records, IRO received medium damage west of Jaluit by USS PLUNGER on February 28, 1943. Four months later, on June 10, IRO was hit again southeast of Fuka Island by USS TINOSA; damage was estimated as light. On March 22, the ship was in Komebai Lagoon, north of Ngemelachel (Malakal) Harbor, when it was torpedoed by USS TUNNY. Damage was estimated as heavy (Alden 1989:34, 46, 90). When the U.S. aerial attack began on March 30, IRO was probably in no condition to attempt escape (Figure 9.96).

Present Description and Analysis

This oiler sits upright in 120 feet of water on a sand and silt bottom. A lush carpet of corals and sponges covers this site. The ship is substantially intact, and damage appears confined to the stern machinery space.

The forecastle is intact and is dominated by an 80-mm, 40-caliber, high-angle naval gun. The forward gun and bandstand are intact, although decking on the stand is absent (Figure 9.97). The forecastle is enclosed by a rail.

The forward mast has fallen aft and lies on the deck. A catwalk runs along the port side from the forecastle to the bridge (Figure 9.98). Both the forward and aft well decks are littered with debris. The bridge structure is intact, although all fittings and instruments have been salvaged. Aft of the bridge, the kingpost for the athwartships fueling gear remains upright, although both fueling pipes have been dislodged (Figure 9.99). The starboard pipe now lies aft of the kingpost.

The stern deckhouse structure is undamaged but has been stripped (Figure 9.100). Wooden floor and roof decking is absent and only the supporting frames remain. The funnel lies to port and is attached to the cowling. Numerous raised expansion tanks are present on both the forward and aft well decks (Figure 9.101).



Fig. 9.97. One of two 80-mm, 40-caliber, high-angle guns on IRO. Wooden decking on both the forward gun (seen here) and the aft gun bandstand has deteriorated. (NPS photo by Toni Carrell)



Fig. 9.98. A catwalk runs the entire length of the ship. (NPS photo by Toni Carrell)

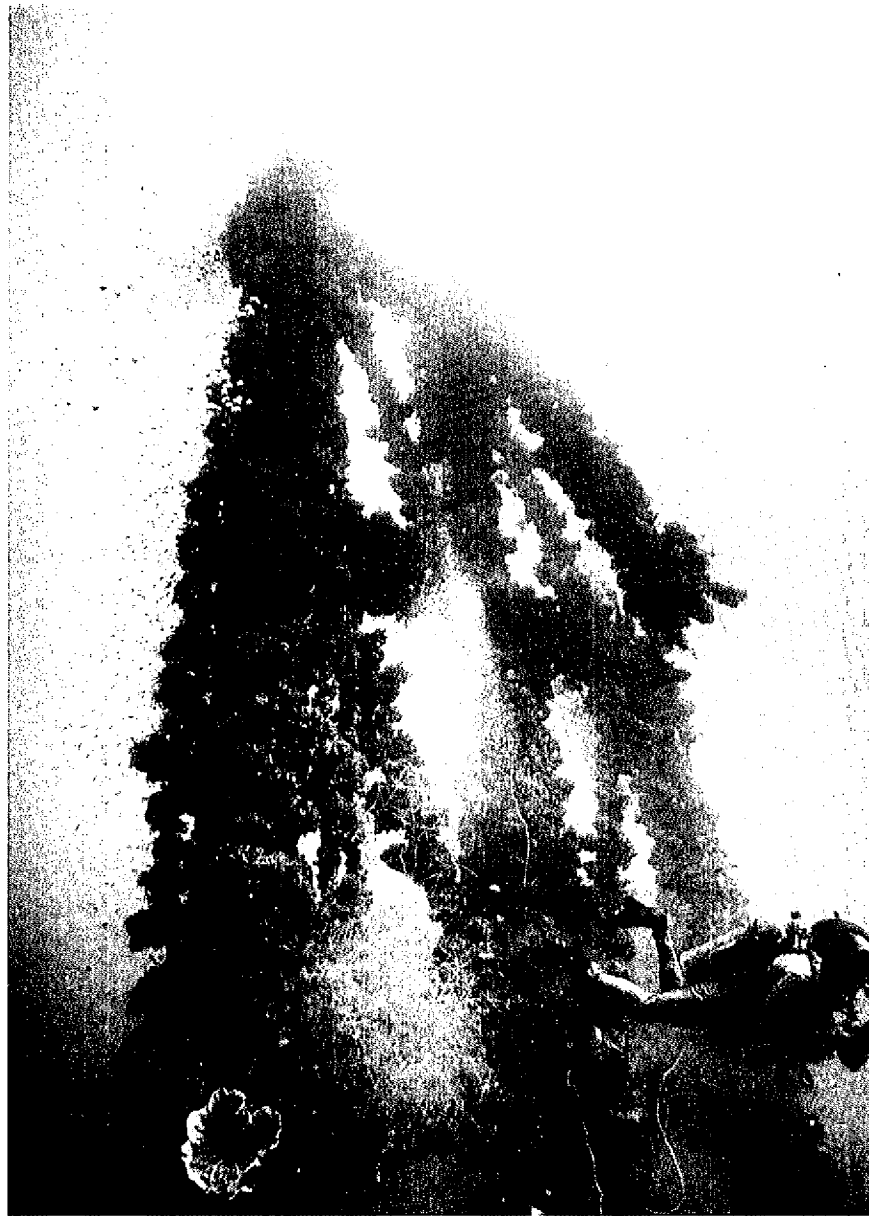


Fig. 9.99. Kingposts for athwartship fueling gear. (NPS photo by Toni Carrell)



Fig. 9.100. Deckhouse aft on IRO. (NPS photo by Toni Carrell)

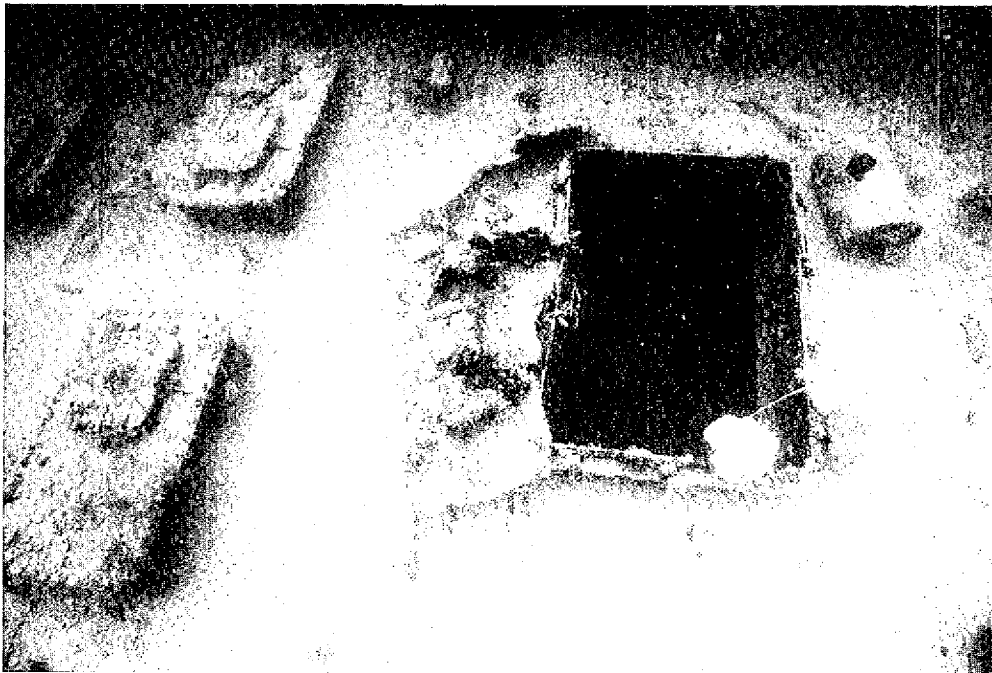


Fig. 9.101. Raised fuel tank hatches on aft well deck. (NPS photo by Toni Carrell)



Fig. 9.102. Book found on 15:UR:01 IRO. (NPS photo by Dan Lenihan)



Fig. 9.103. Page removed from book on 15:UR:01. (Photo by James Roybal)

The stern gun and bandstand are intact as is the stern area. Damage to this ship is below the water line as no visible structural damage is visible from examination of the deck.

The site was documented only with photographs and videotape. Some limited measurements were taken to facilitate an artist's drawing. No formal mapping was undertaken on the ship in order to avoid adversely impacting abundant fragile marine life present.

A large book was found on the ship during the NPS/Navy survey and one page was carefully removed for analysis. It was determined to be a technical manual related to operation of the ship. The book was returned to the place it was found and covered over for protection (Figures 9.102 and 9.103).

SATA (B:OR-15:UR:05)

SATA, sister to IRO, is located in the middle of Ngeruktabel (Urukthapel) Anchorage (refer to Figure 9.71). Only one brief reconnaissance dive was made on SATA, although an ROV (remote operated vehicle) was used to examine the site at a later date. At press time, it has come to our attention that researchers Klaus Lindemann and Frances Toribiong have obtained new information suggesting the identity of the two sister ships (SATA and IRO) are reversed (Rock 1991). We cannot conclusively confirm or reject this hypothesis, but the site descriptions herein would apply regardless of name identification.

Historical Background

One of 10 Shiretoko Class oilers built between 1920 and 1923, SATA was built by the Yokohama Dock Company. It was launched on October 28, 1920, and completed February 24, 1921. Like its sisters, SATA had a split superstructure, bridge amidships and engine room aft (Figure 9.104). Between 1928 and 1932, it was reboilered with 4 Kampon Type 1 boilers. Like its sister, IRO, it was rearmed with two 80-mm, 40-caliber, high-angle guns, and four 13.2-mm antiaircraft guns were added.

On February 17, 1944, SATA was steaming north of Chuuk when it was attacked by USS SARGO. SARGO estimated that damage inflicted was only medium (Alden 1989:85). By March, however, SATA was at anchor in Ngeruktabel (Urukthapel) Anchorage. On March 30, 1944, when the U.S. aerial attack began, SATA was attacked and fatally damaged (Figure 9.105). Its presence in the anchorage probably indicates that the ship was in no condition to attempt escape.

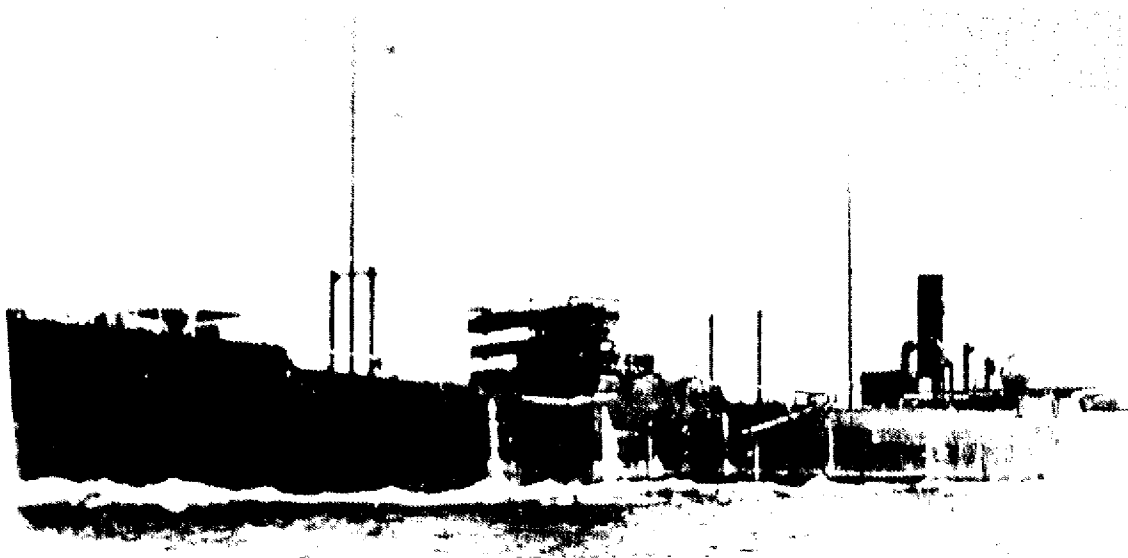


Fig. 9.104. Historic photograph of SATA prior to installation of forward high-angle guns. (Photo courtesy of Dr. Sanae Yamada)



Fig. 9.105. SATA sinking in Ngeruktabel (Urukthapel) Anchorage. Barrels of fuel oil can be seen floating in the bay. (Photo courtesy of National Archives)

Present Description and Analysis

The wreck now lies upside down in 110 feet of water on the coral and sand bottom. The ship lists slightly to port, making it possible to look underneath on the starboard side. The ship is resting on its superstructure, which has partially sunk into the soft sediments of the bottom.

The bow of the ship appears intact, and anchor cable runs out of the starboard hawsehole. Approximately 100 feet aft of the stem on the port side, there is a 30-by-20-foot hole in the hull. A lateral crease in the plating runs almost from the starboard bilge keel, across the bottom to the area of the explosion. At the hole, the hull plating is blown into the interior of the ship, obviously damage from a torpedo that skimmed under the bottom of the ship before exploding.

Well-defined bilge keels, 28 feet, 6 inches from the centerline, run nearly the length of the ship's bottom. No centerline keel is present. The bottom of the ship has retained its shape and other than the hole, forward, is little damaged. The bottom of the hull in the area stern is also undamaged. The propeller for the large single screw measures 4 feet, 8 inches, wide and 6 feet, 11 inches, long, while the rudder is 10 feet, 7 inches, wide. The ship is oriented 30 degrees west of magnetic north.

Although no damage is apparent on the starboard side of the hull, another large hole is on the port side. A photograph of the anchorage, which was taken at the time of the U.S. aerial attack, shows the torpedo trail leading toward the stern of the oiler (Figure 9.106). The combination of the damage in the stern, which caused the ship to sink stern first, and the hole in the bow, which caused a loss of residual buoyancy, resulted in the ship capsizing.

Unidentified Merchant Ship (B:OR-15:UR:02)

This ship has been called HOKOTAI MARU by local divers and identified as GOZAN MARU by others (Lindemann 1988:24). Field examination of the remains eliminated both of these ships as possible candidates. In addition, documents received from Fujita Salvage place GOZAN MARU well north of this location in Ngemelachel (Malakal) Harbor.²⁰ Correct identification of this ship was not possible from available

²⁰Information on the historic description and miscellaneous particulars for this ship is based upon documents provided by Dr. Sanae Yamada.



Fig. 9.106. Ngeruktabel (Urukthapel) Anchorage during the bombing strike on March 30, 1944. SATA is the middle ship, approximately center. (Photo courtesy of National Archives)

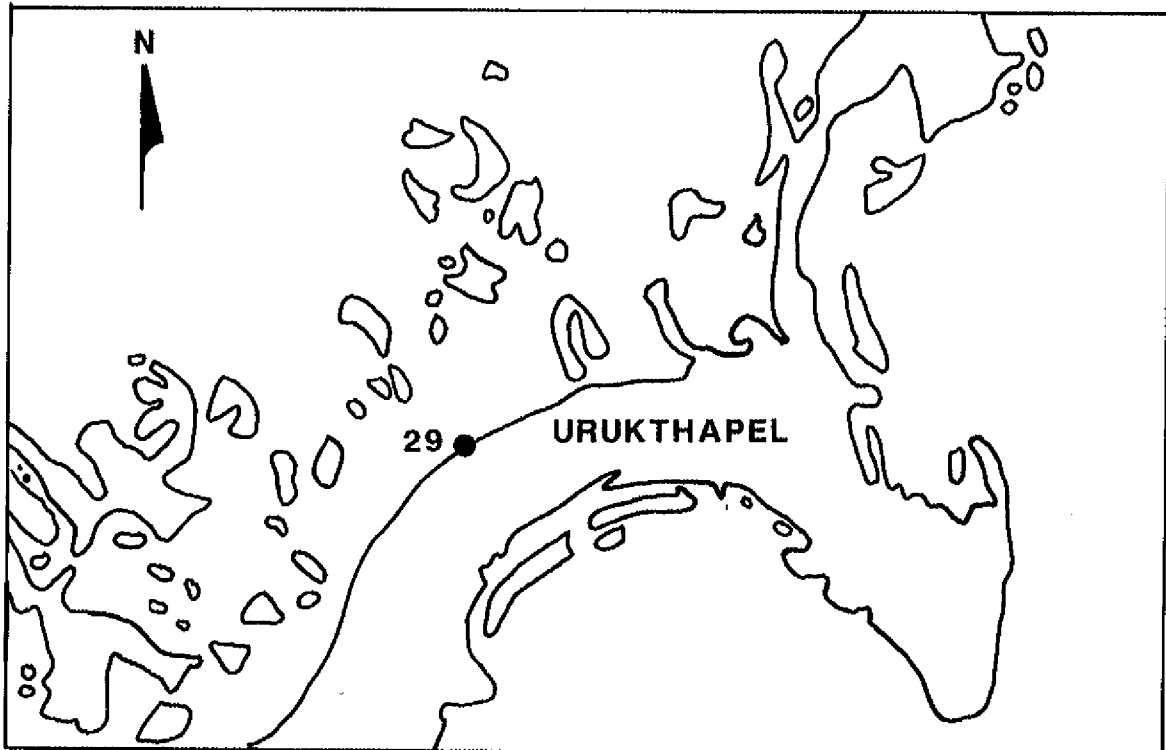


Fig. 9.107. Location of unidentified merchant ship south of Ngeruktabel (Urukthapel) Anchorage.

B:OR-15:UR:02 MERCHANT SHIP
STAT: 388'-6" OR 52'-6" BEAM

435

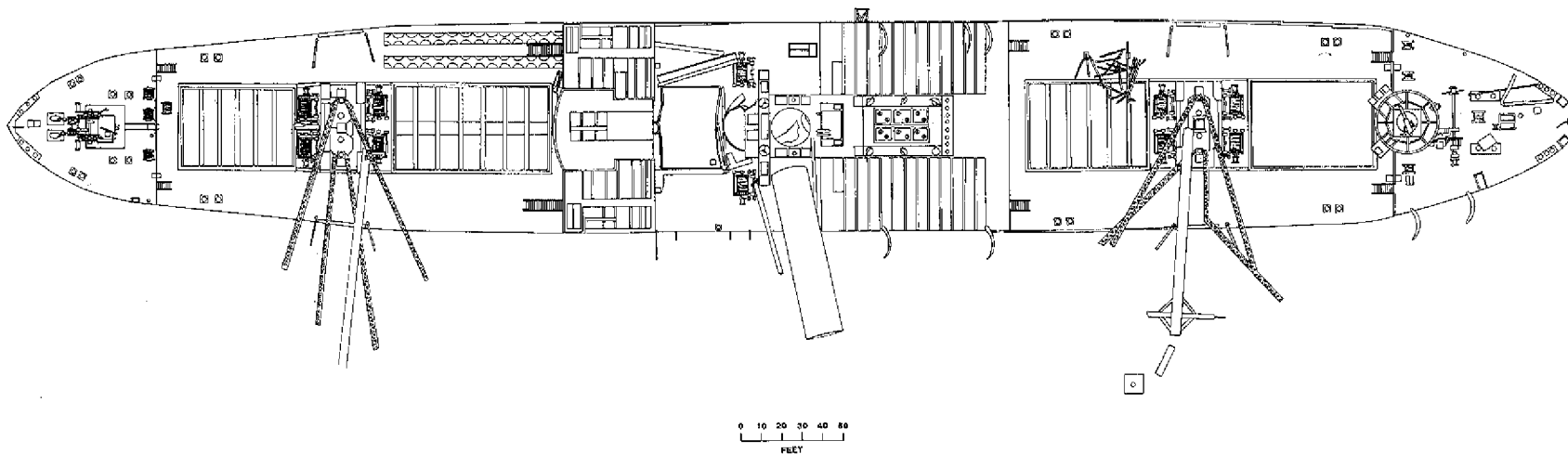


Fig. 9.108. Base map of unidentified merchant ship in the Rock Islands, Belau.

archival information. Additional archival research should clarify the identity of this ship.

The large, unidentified, merchant ship is located south of Ngeruktable (Urukthapel) anchorage in the channel leading south to the Rock Islands (Figure 9.107).

Historical Background

As yet, no archival documents have come to light that provide information on the identity of this ship. It is known that the ship was sunk during the aerial bombing attacks on March 30-31, 1944, because it is accurately located, as number 29, on a map drawn from aerial photographs taken on those two days (refer to Figure 9.107).

Present Description and Analysis

The ship is listing 69 degrees to port in 100 feet of water on a sand and silt bottom. The ship is substantially intact, and the damage appears confined to the starboard side, below the water line and the Number 2 cargo hold (Figure 9.108). This vessel has a composite superstructure, single funnel, raked bow, cruiser stern and single screw. It is well-decked with four cargo holds, raised forecastle and poop, and a 5-inch outside diameter gun mounted in the stern.

The forecastle machinery--the winch and chain breaks--are intact and in good condition. Anchor chain runs through the winch down through the hawseholes in the deck into the chain locker. The port anchor has slipped out of its pocket and is buried in the soft sand and silt bottom. The starboard anchor remains in its housing. Mooring bits, fairleads and small cargo boom winches, two on starboard and one the port side, located along the aft rail complete the bow. A fourth winch lies below the forecastle deck on the well deck below.

Ladders lead from the forecastle down to the forward well deck. Doors at the deck level lead into the forecastle compartments. Four large cargo winches, a small mast house, and the single forward mast occupy the space between holds 1 and 2. Hatch cover beams are in place over both holds (Figure 9.109). The ship is double-decked in the holds, and beams also remain in place on the second deck in hold 1. The 'tween deck height is 9 feet, 1 inch. None of the wooden hatch cover decking is present, and no cargo remains in either hold.

Because of the ship's list, all of the cargo booms lie across the gunnel and their tips reach toward the bottom. A heavy cargo boom has broken loose and lies under the starboard boom from hold Number 2. Unusual features of the cargo-handling

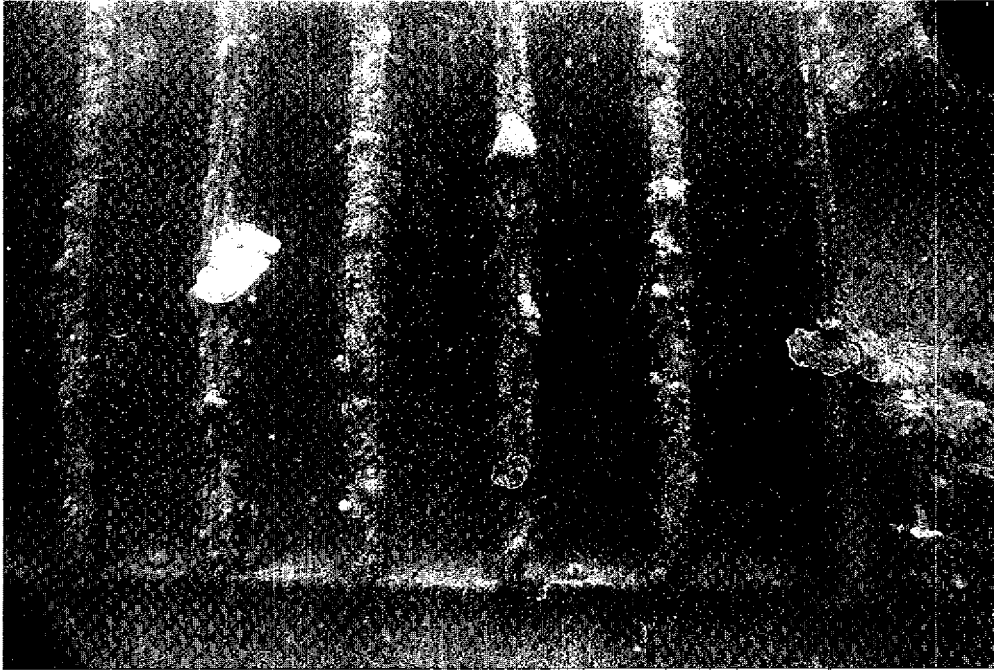


Fig. 9.109. Cargo hold hatch cover beams on the large, unidentified, merchant ship. (NPS photo by Toni Carrell)



Fig. 9.110. Open door into the bridge at the main deck. (NPS photo by Toni Carrell)

equipment are its square, lattice-work booms and short, square, boom stands. The forward mast remains in place, and a ladder runs up more than 40 feet from the base. Overall, the mast is 64 feet long. Forty feet from the base, a rectangular platform, 8 feet by 2 feet, 4 inches, is present and was possibly used by the supervisor of cargo-handling. Three other, smaller, platforms for the ship's running lights are 2 feet, 6 inches, 10 feet, and 17 feet above the cargo supervisor's platform.

A large hole has been torn in the port side of the ship in the area of hold Number 2, just forward of the bridge. The explosion, which tore into the hull and made a hole approximately 15 by 15 feet, folded the steel plates inward.

An unusual feature is located on the starboard side of the well deck. Two steel racks parallel the Number 2 hold. These racks are each 44 feet, 2 inches, long and extend from the midships deckhouse to just beyond the Number 2 hatch coaming. They are 2 feet, 4 inches, high overall with a 1/4-inch plate on top that is scalloped. The scallops are uniformly 2 feet, 9 inches, from outside edge to outside edge. These racks are welded to the deck and so do not appear to be cargo. The starboard access ladder to the bridge is neatly wedged between these unusual features. Doors lead from the well deck into the lowest level of the bridge (Figure 9.110). The port door is open whereas the starboard door is lying on the deck.

The bridge and machinery space superstructures are intact; however, the bridge has been stripped of instruments and fittings. Wooden decking is absent, and only the metal framework remains over the bridge and machinery space deckhouse. The pilothouse curves slightly forward in a shallow arc. Immediately aft of the bridge is the hold for receipt of fuel for the ship, very probably coal. Two cargo winches are located on either side of this small hatch (Figure 9.111).

Immediately aft of the engine room hatch, the large intakes are in place. The funnel is disarticulated and lying on the port side (Figure 9.112). On the starboard side of the ship outside the hull, there is a short gangplank ladder. The machinery space deckhouse is intact, but it too has been stripped and none of the wooden decking is present. The engine room skylights have their glass in place, and five of the six ventilators are cowled. The ship's lifeboat davits are also in this area. Three of the four are in place, swinging downward, on the starboard side. On the port side, only two of the four remain.

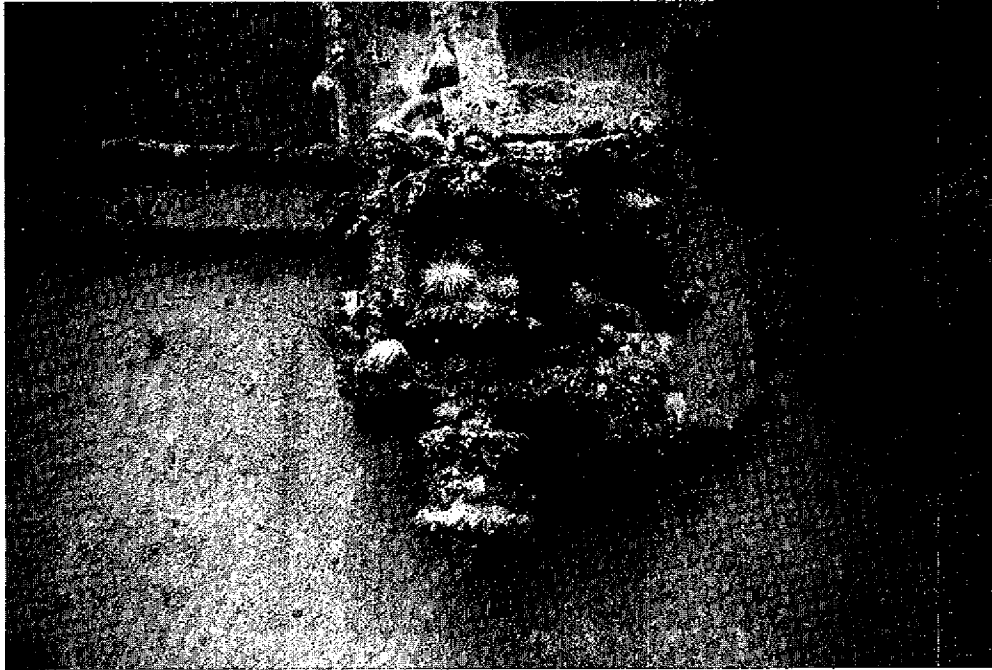


Fig. 9.111. Small cargo winch located at the engine room cargo hatch. (NPS photo by Toni Carrell)



Fig. 9.112. The large funnel has broken off and is lying to port; only the base cowling is still in place. (NPS photo by Toni Carrell)

Ladders lead from the second level of the deckhouse to the aft well deck. With the exception of a clutter of twisted pipe on the starboard side of hold Number 3, the deck is clear. The hatch covers are in place only on hold 3, and the wooden decking is absent. No cargo is present in the aft holds. The boom stands, located both forward and aft along the gunnel, swing down toward the port side. All four of the aft cargo booms are articulated, although the port boom for hold Number 4 is broken. The aft mast has broken away from its base and fallen to port. The crosstree is attached, although the topmast has broken off and lies a short distance away. A small box or container, about 4 by 4 by 4 feet, is in the same vicinity.

The stern is reached by two ladders. Just behind the rail in the stern are three, small, cargo boom winches, two on the starboard side and one on the port. The raised poop is dominated by a gun mount that is 14 feet, 9 inches, in diameter. Two platforms, holding ammunition boxes, are attached to the mount, which no longer has any of the wooden decking. The massive size of the mount dwarfs the gun that is in place. The barrel is only 4 feet, 7 inches, long. Aft of the gun is a large winch. Two bollards and a fourth small cargo drum are in this area as well. A piece of sheet metal is lying adjacent to the port bollard while two pieces of twisted wreckage lie on the starboard side. The stern flagstaff is present.

The stern is intact, and the rudder and propeller are in place. The ship measures 389 feet, 6 inches, long overall and 52 feet, 6 inches, in breadth.

NAGISAN MARU (B:OR-15:UR:03)

NAGISAN MARU, a Japanese cargo ship, is located in the southeast area of Ngeruktabel (Urukthapel) Anchorage behind a small island. It is accurately located as number 26 in a sketch of the anchorage based upon information obtained from aerial photography (refer to Figure 9.107).

Historical Background

NAGISAN MARU was built by the Tama Factory shipbuilding department of Mitsui Bussan.²¹ The keel was laid on hull number 181 on August 14, 1930, and the ship was delivered to

²¹Information on the historic description and miscellaneous particulars for this ship is based upon documents provided by Dr. Sanae Yamada.



Fig. 9.113. Historic photograph of NAGISAN MARU. (Photo courtesy of Dr. Sanae Yamada)



Fig. 9.114. The heavy carpet of corals on the bow of NAGISAN MARU disguises the anchor winch (center) and cargo boom winch (right). (NPS photo by Toni Carrell)

owners Mitsui Bussan on April 25, 1931. Constructed as an armed cargo transport, the steel-hulled ship was registered as number 36560 at the port of Kobe. The ship's gross tonnage is 4,391 and it had a capacity of 9,045 cubic meters (bale). It is 362 feet long on the water line, 50 feet in beam, 29 feet in depth of hold, and 23 feet, 6 inches, draft, fully loaded. It could carry a crew of 33 and was considered a first-class ship of the communication department.

The ship has a split superstructure, bridge forward of amidships, and engines and single funnel aft. It is well-decked, with raised forecastle and poop, raked bow, counter stern, and single screw (Figure 9.113). Five holds, two forward and three aft, are present. Three sets of kingposts, one forward and two aft, serve the holds. Intended to be armed, gun mounts are located just aft of the forecastle and between holds four and five. NAGISAN MARU was equipped with a diesel engine capable of 12 knots.

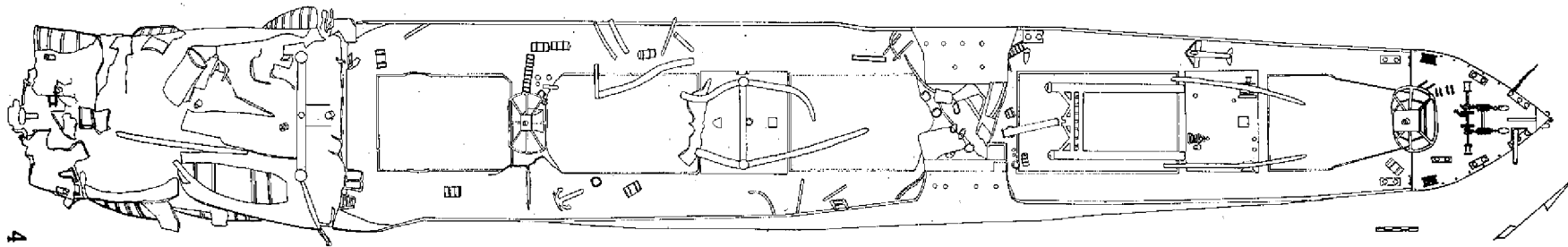
Little is known of NAGISAN's operational history. It was a general merchant ship prior to being requisitioned by the Japanese Navy as a transport and having gun mounts installed on the deck. What is known, however, is that on February 6, 1943, the ship was torpedoed near Tinian by USS FLYING FISH. Damage from the attack was estimated as medium (Alden 1989:31). Why NAGISAN did not leave Belau prior to the attack on March 30, 1944, is not clear. Archeological evidence indicates the ship was fully laden with fuel oil, which may have been sorely needed by the Japanese on the island. In any case, NAGISAN MARU was sunk by aircraft from Task Force 58 on March 30, while moored behind a small island in the southeast corner of the anchorage (refer to Figure 9.106).

Present Description and Analysis

NAGISAN MARU sits upright in 100 to 110 feet of water in a silty cove. The ship is badly damaged, with the exception of the forecastle (Figure 9.114).

The forecastle is intact and heavily overgrown with corals (Figure 9.115). The flagstaff in the peak leans back and almost touches the deck. The anchor winch and chain breaks are in place, and chain runs from the winch through the breaks and down into the hawseholes on the deck. The port anchor is out, and chain runs down into the silty bottom. Port and starboard, aft of the anchor winch, are the two small cargo boom winches for hold Number 1. A rail rings the forecastle. The only obvious damage to the forecastle is evidenced by the forward gun mount, which has tipped aft into hold Number 1. The "bandstand" or base of the mount is also

B:OR-15:UR:03 NAGISAN MARU



443

Fig. 9.115. Base map of NAGISAN MARU.

overgrown with corals, and all of the wooden decking is gone. Only the base of the former gun remains.

Ladders on port and starboard lead from the forecastle to the forward well deck. A 55-gallon drum, part of the ship's former cargo, lies on the starboard side of the deck below the ladder. The main deck of the ship from bow to the raised poop is warped and buckled. The main deck sags downward until it is just a few feet above the lower deck. Surprisingly, the shape of hatch Number 1 is not distorted. Its odd shape (refer to Figure 9.114) was the result of an effort by the builders to accommodate the narrowing of the hull in the bow.

A winch deckhouse and a kingpost mast separate holds Number 1 and 2. The forward kingpost mast has fallen into hold Number 2, which caused the winch house to collapse aft as well. The kingpost topmast caused additional damage to the battered and crumpled bridge.

A paravane sits on its mounts on the port side of the Number 1 kingpost set. Brackets for a second paravane are present on the starboard side. The evidence of a towing bracket or other support equipment for deployment of the paravane was observed on the site. A paravane was used as part of minesweeping gear, deployed from the bow of a ship.

The starboard gunwale curls inward to just aft of the bridge. Booms appear to have been melted rather than broken. Aerial photographs of this vessel show it ablaze. Evidence of fuel drums litters the 'tween decks and main deck.

The second kingpost mast, between holds 3 and 4, remains upright atop the winch house (Figure 9.116). The cargo booms are badly deformed, looking like limp Dali watches. Debris and fuel drums litter the aft deck. The gun mount between holds 4 and 5 tilts aft.

Ladders lead up from the buckled well deck to the stern deckhouse and machinery space (Figure 9.117). The third set of kingposts, which served hold 5, is also intact including the topmast. The starboard boom is present, and the port boom is disarticulated.

The stern is heavily damaged with the deckhouse and machinery space blown outward. The counter is indistinguishable, and it appears the final several feet of stern have been obliterated. The funnel lies to port.

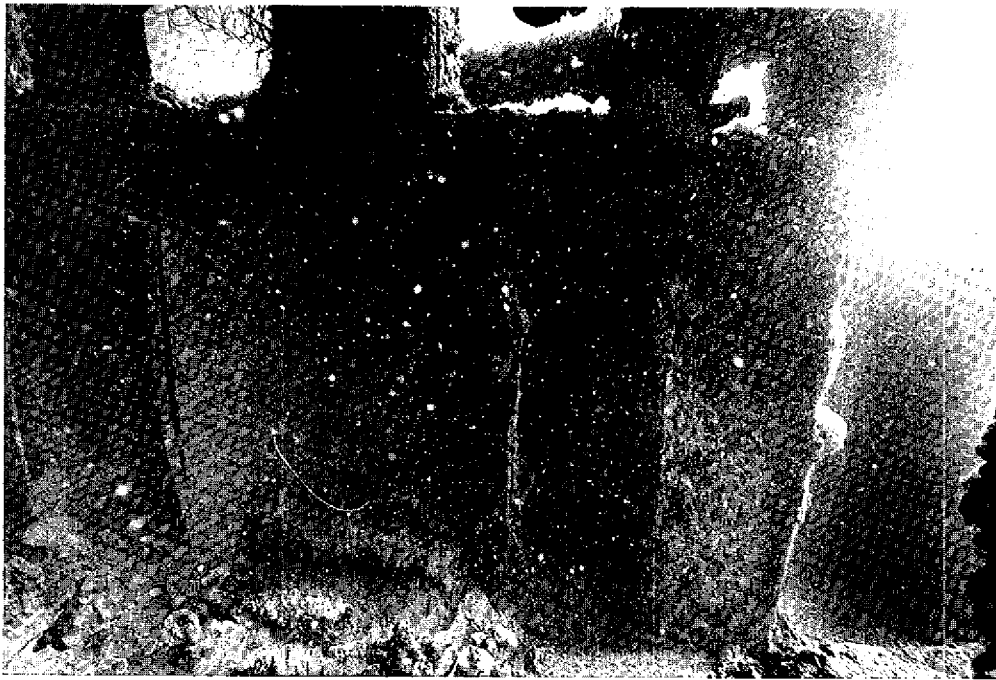


Fig. 9.116. Deck winch house between holds three and four.
(NPS photo by Toni Carrell)



Fig. 9.117. Ladder to stern deckhouse and machinery space.
(NPS photo by Toni Carrell)

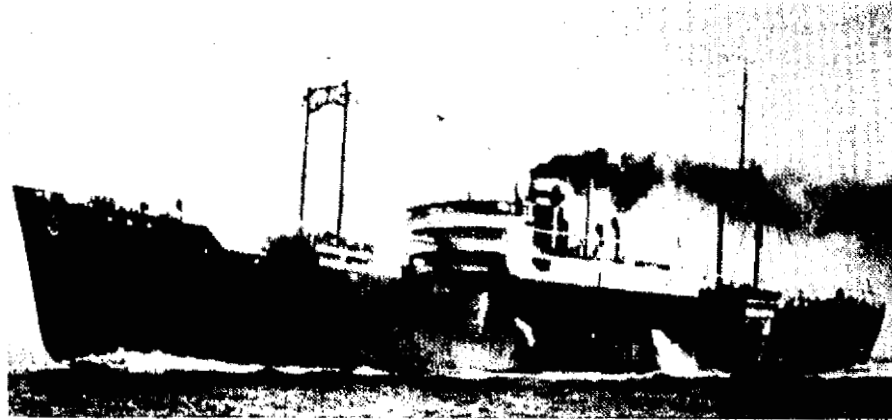


Fig. 9.118. Historic photograph of KAMIKAZE MARU. (Photo courtesy of Dr. Sanae Yamada)

KAMIKAZE MARU (B:OR-15:UR:04)

KAMIKAZE MARU is lying on a sand and silt bottom in 100 to 120 feet of water in the channel south of Ngeruktabel (Urukthapel) anchorage. It is accurately located as Number 28 in a sketch of the anchorage based upon information obtained from World War II aerial photography (refer to Figure 9.107). The identification of this site has been disputed, but field examination and information translated from documents received from Fujita salvage leave little room for doubt.²² The ship was located by Fujita at 7°16'35" north, 134°25'9" east.

Historical Background

KAMIKAZE MARU was designed with a composite superstructure, that is, with bridge and machinery space amidships. It had a raised forecastle and poop, raked bow and cruiser stern. Two holds forward and two aft were each separated by a winch house mounted by a kingpost mast (Figure 9.118). Its sleek hull was painted black while the superstructure was white.

KAMIKAZE MARU was built at the Osaka Tetsukosho Sakurajima Factory from July 31, 1937, when the keel was laid, to March 19, 1938, when it was delivered to owners Todai Kisen.²³ The ship was registered at the port Osaka and given serial number 44360. The steel-hulled cargo ship had a gross tonnage of 4,916.04 and a displacement of 10,085. It was capable of carrying 9,232 cubic meters of cargo (bale). Its length was 369 feet at the water level, 54 feet in beam, 29 feet, 3 inches, in depth of hold, and it had a load draft of 24 feet.

Its geared turbine engine was able to make 13 knots, and the ship was rated to carry a crew of 43. It was considered a first-class ship of the Communication Department.

KAMIKAZE MARU had an interesting operational history. According to Dr. Sanae Yamada:

²² Unpublished documents provided by Mr. Fujita of Fujita Salvage on the location, condition and suitability of salvage for 37 ships in Belau.

²³ Information on the historic description and miscellaneous particulars for this ship is based upon documents provided by Dr. Sanae Yamada.

After being requisitioned by the Navy on July 28, 1941, KAMIKAZE MARU was sent to Uraga and equipped as a special torpedo mother boat. It was then transferred to Kure. On October 1, 1941, it carried out a supply task as a special torpedo mother boat assigned to the Number 2 fleet at inland and Bakou areas. In December 1941, she joined as a supply soldier boat of the supply fleet under direct control of a southern force, preparing for open war. On December 7, 1941, she left [indecipherable] at 1:00 pm, then anchored at [indecipherable] harbor; she joined the installment of an advanced air base.

From January 1, 1942 to March 23, she carried out supply tasks at [indecipherable] and the Bakou area. From March 24 to July 15, she carried out supply tasks along the mainland and from April 14 to 22, it was fixed at Kure dock.

From July 16, 1942 to November 14, she carried out supply tasks between Japan and the Truk islands under the direction of the advanced force. In addition to this, on September 8, she belonged to a special attacking force against Guadalcanal Island and helped the high-speed transport fleets.

From January 19 to 22, 1943, she was fixed at Kure Dock. Between August 13, 1943 and March 29, 1944 it carried out supply tasks under the direction of a flying column as an advanced force at Truk and Palau. [In that capacity] ... on December 1, 1943 it sailed up as 8012 fleet to Palau, then arrived at Truk on December 8.

On March 30, 1944, she sank at [indecipherable] island in Pelau by attacking of air bombers from No. 5 American Fleet (Dr. Sanae Yamada, personal communication).

Present Description and Analysis

This site was visited only briefly by NPS divers. Because of depth, limited visibility, and time constraints, only the forward half of the ship was examined. However, that examination, coupled with information provided by Avi and Orli Klapfer, the original discoverers of the site, supported the identification as KAMIKAZE MARU.

This ship is badly damaged, but still-recognizable features are present. The hawseholes are discernible on the bow, but little else is. The remainder of the forecastle is disarticulated from the forward well deck. Coils of wire cable lie in the crevice. The large forward holds may have been plated or somehow covered over during its special conversion, because the deck was unbroken to the area of the bridge. The deck plates were buckled, and the hull bulges outward in this area. According to the Klapfers, the forward hold is penetrable and contains the remains of boxes, gas cylinders, or torpedoes, still in their racks (personal communication). It was this evidence that initially led to the identification of this site as KAMIKAZE MARU.

The bridge and machinery spaces are blown apart, the entire structure listing slightly to port. A companionway is identifiable but no clear evidence of the bridge superstructure remains. The steel hull plates are twisted and bent, and only a portion of the funnel remains. The engine room is visible, and it is possible to enter.

Only one ship sunk in Palau is known to have been a torpedo transport, KAMIKAZE MARU. The presence of torpedoes in the holds explains the extensive damage to the integrity of the ship structure.

Unidentified Small Motor Torpedo Boat or Submarine
Chaser (B:OR-15:UR:06)

Mistakenly identified as an ammunition ship, this small, badly damaged, steel-hulled boat lies in 15 to 35 feet of water near NAGISAN MARU. It is accurately located as Number 27 in a sketch of the anchorage based upon information obtained from World War II aerial photography (refer to Figure 9.107).

Present Description and Analysis

Only 28 feet of the forward portion of the ship were observed on the bottom. A total of 46 feet of shaft are present, partially exposed and lying up against the shore. This feature has been misidentified as a section of mast. The hull shape is a deep "V" with flush deck, and upright

capstans. Chain runs from the chain locker, around both capstans, and into the hawseholes. The bow portion is lying on its starboard side. A beam measurement, aft of a flush-deck scuttle, is 14 feet, 8 inches.

A small bower anchor is present in the port anchor pocket. A 7-foot-7-inch gear box is lying slightly off to starboard of the bow. Additional disarticulated remains are present above the site on the nearby rock island.

Follow-up work on this site should include a swimmer search of the adjacent area and examination of the rock island for additional remains.

Administrative Status

Title to all cultural resources is held by the Republic of Belau. An effort is being made to inventory sites and to place significant ones on a Belau National Register; as of this writing it is not known whether any of the above sites are on that register.

Present Threats and Impacts

The World War II shipwrecks consistently receive the most attention from sport divers. An effort is being made to limit the impacts of "collectors"; however, there is no strict enforcement. Protection of the sites has been left to the diver shop operators who, at best, have a mixed set of standards for what is acceptable and not acceptable on the sites. During mapping of the as-yet-unidentified merchant ship in the channel south of Ngeruktable (Urukthapel) anchorage, a section of airlift was discovered. This recently discovered site contains many portable artifacts, which will rapidly disappear if not carefully protected. Most if not all of the portable artifacts, brass fittings, and instruments have been removed or salvaged from all of the more frequently visited sites.

With little urging, the casual wreck diver is not inclined to remove artifacts. However, of more concern are the hard-core wreck divers and avocational "researchers" who feel that they are not restricted to just looking. They feel that it is perfectly acceptable to remove china or dig in the sediments in the holds in an effort to "discover" the name of a particular site. Many come equipped with sophisticated metal detectors or magnetometers. They search for and dig sites without control or the knowledge of the Division of Cultural Affairs, the agency charged with preservation of these important sites. These same individuals leave Belau with their artifacts and notes on the sites they have visited. To date, none of these individuals has left copies of their

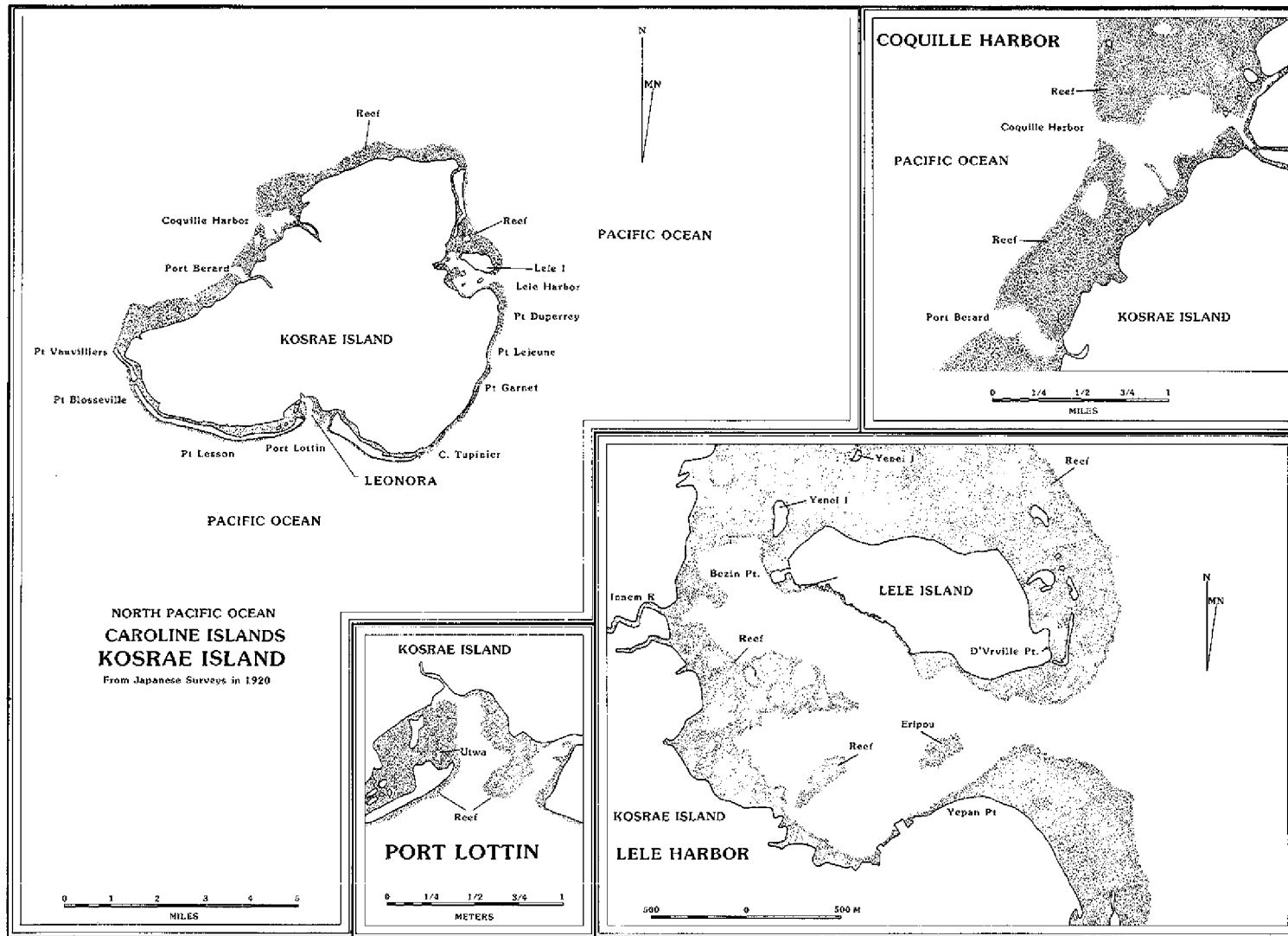


Fig. 9.119. Location of LEONORA near Utwa on Kosrae.

information with Cultural Affairs. Legislation limiting the use of metal detectors and magnetometers, similar to that currently in force within the U.S. national parks, would go far in limiting the depredation of the sites. Adequate funding to support local programs of education and a system of monitoring and enforcing preservation of the sites is also needed if they are to remain a viable factor in increasing tourism to the island (Kelly 1988).

State of Kosrae

A dozen ships are known to have wrecked in and around the island of Kosrae. They span 150 years from the whaling era to World War II. One of the most famous wrecks in Kosrae is that of the schooner, LEONORA, lost in 1874.

Unlike the majority of the islands in Micronesia, the most numerous wrecks around Kosrae are those that date from the whaling and trading era. Only one site from World War II is known to exist, that of a transport.

Site-Specific Investigations

Of the many sites in Kosrae, it was only possible to document LEONORA, sunk in Port Lottin near the small village of Utwa (Figure 9.119).

LEONORA²⁴

In 1981, the NPS SCRUI carried out a site reconnaissance on the remains of a copper-clad wooden vessel in Utwa Harbor, Kosrae. It was presumed to be the wreck of the ship LEONORA, captained by the notorious Bully Hayes, an important historical figure in the Caroline Islands in the latter part of the nineteenth century.

The field work was requested by Chief Kan Isiah (Figure 9.120) through the Kosrae State Historic Preservation Officer, Teddy John and Scott Russell, then Director of the Office of Historic Preservation, Trust Territory of the Pacific Islands (TTPI).

Tasks identified in the scope-of-work were to

1. determine if the wreck was of correct size, class and period to represent the remains of LEONORA;

²⁴The section on LEONORA was written by Daniel J. Lenihan.



Fig. 9.120. Teddy John, Historic Preservation Officer for the State of Kosrae, coordinated LEONORA site evaluation in 1981. (NPS photo by Toni Carrell)



Fig. 9.121. Uwa village, 1981. Tank-filling operations became a community affair with many villagers in attendance. (NPS photo by Toni Carrell)

2. locate the extent of the main site and identify additional scatter areas;
3. map exposed portions of the wreck;
4. photo-document exposed areas of the site;
5. construct a semicontrolled photomosaic of the site;
6. describe the present state of preservation; and
7. prepare a project report including management recommendations.

The project was directed by Dan Lenihan, unit chief, and participants included SCRU archeologists Larry Murphy and Toni Carrell. A historical background study was provided by Paul Ehrlich. Additional field personnel included Peace Corps volunteer Bob Adair from Ponape and Kosrae State Historic Preservation staff led by Teddy John.

All project objectives were accomplished during the 8 days spent on the ground in Kosrae, and a final report was submitted to TTPI and Kosrae several months later.

It was determined that the site examined in Utwa met all of the test criteria designed to assess whether it was indeed the remains of LEONORA, which sank in that vicinity in 1874. Even though much of the site was covered with overburden, and excavation was not part of the scope-of-work, enough was visible to erase any reasonable doubt that this was LEONORA.

The report presented a number of options for future site management emphasizing protection in place, interpretation to a visiting public, and eventual limited testing or partial excavation to learn more of its extent and integrity. The tenets of low-impact "conservation archeology" as they applied to the site were discussed in detail. Itemized budgets for conducting limited subsurface testing and full excavations were also presented for consideration.

A phased list of recommendations was then offered and discussed as follows.

1. Develop a long-range protection and monitoring strategy immediately for the wreck site.
2. Conduct limited test excavations on the site with only highly selective removal of artifacts.
3. Interpret and display materials removed from site.



Fig. 9.122. Dan Lenihan, Chief of Submerged Cultural Resources Unit, records artifacts retained by Historic Preservation Office, Kosrae. (NPS photo by Bob Adair)

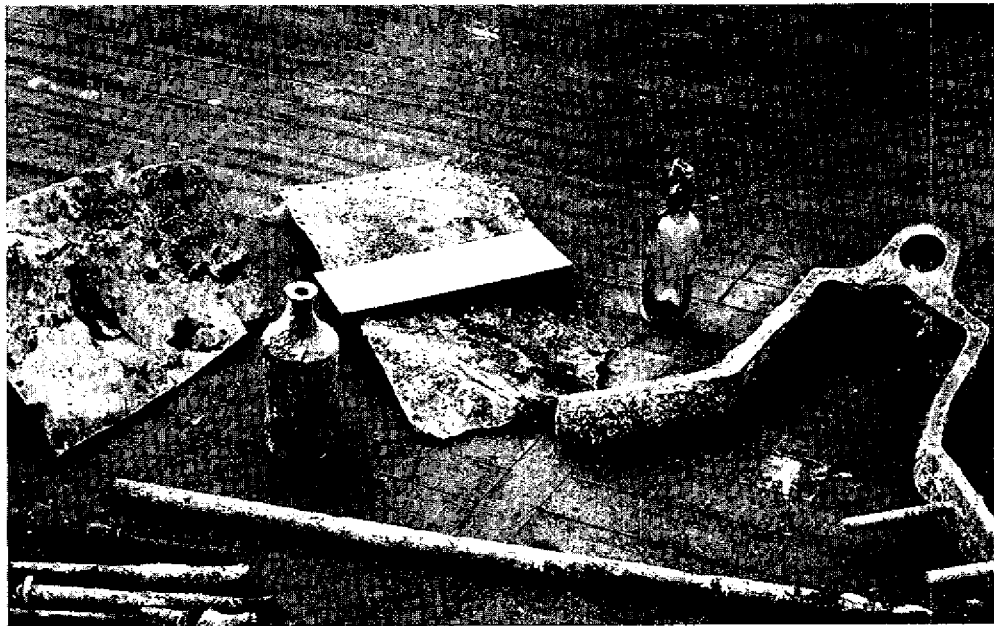


Fig. 9.123. After returning from the 1981 field work in Kosrae, Lenihan visited the STAR OF INDIA museum in San Diego and recorded several items removed by a Scripps Institution expedition whose members visited the site in 1967. (NPS photo by Dan Lenihan)

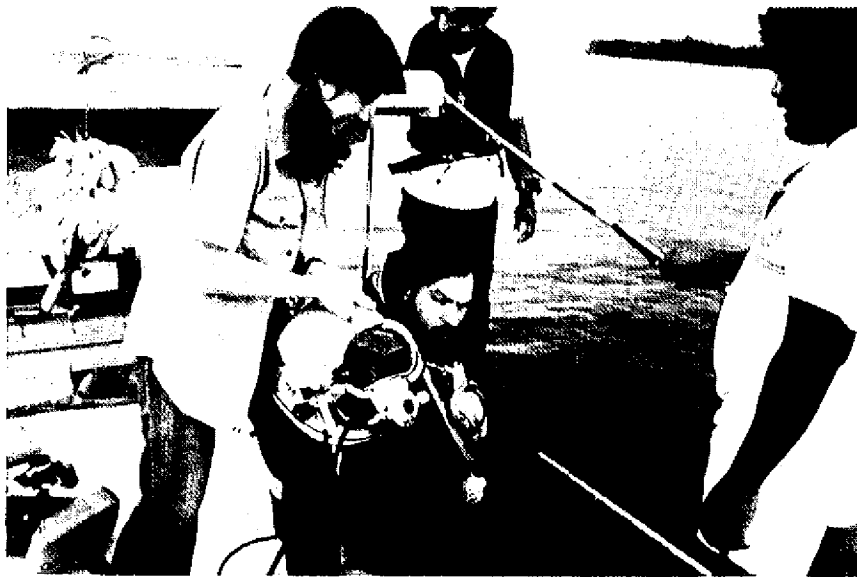


Fig. 9.124. NPS SCRU, and Kosrae Historic Preservation Office personnel ready research boat for underwater video operations. In 1981 the only available technology was black-and-white recording through hardline from a diver wearing a helmet. Left to right, Toni Carrell, Larry Murphy (sitting), Julian Jonah and Teddy John. (NPS photo by Paul Ehrlich)



Fig. 9.125. Chief Kan Isiah and other villagers review video footage at night from the day's diving. This is some of the first television ever seen in this part of Kosrae. (NPS photo by Dan Lenihan)

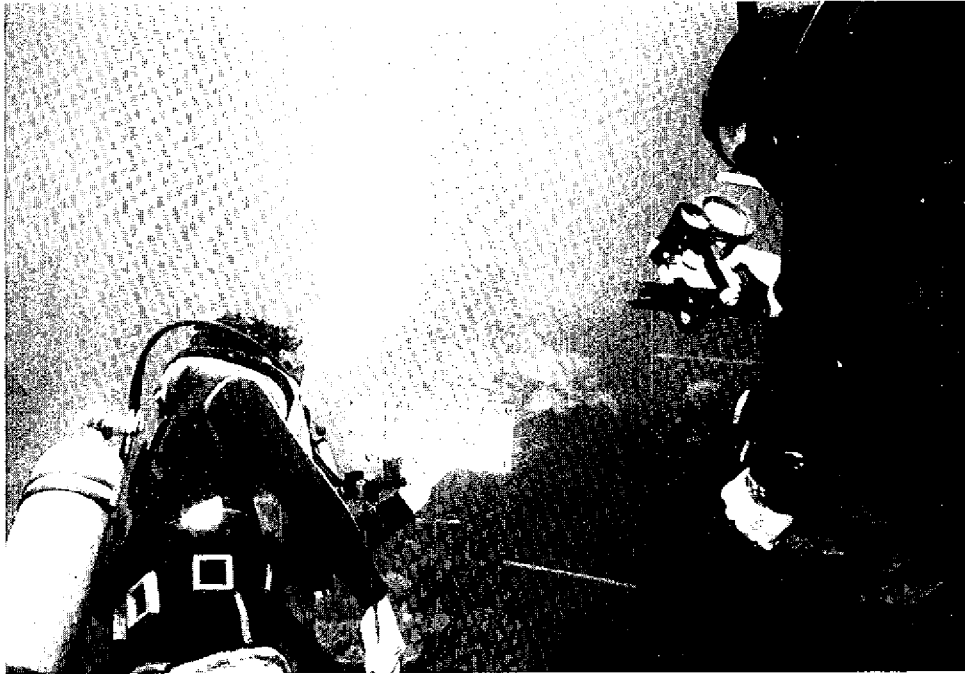


Fig. 9.126. SCRU archeologists (Lenihan--left, Murphy--right) making photomosaic of LEONORA site. (NPS photo by Toni Carrell)



Fig. 9.127. Julian Jonah holds end of measuring tape to baseline on LEONORA site, Kosrae, 1981. (NPS photo by Dan Lenihan)



Fig. 9.128. Feature 5, copper sheathing on shipwreck in Utau Harbor believed to be LEONORA. (NPS photo by Toni Carrell)

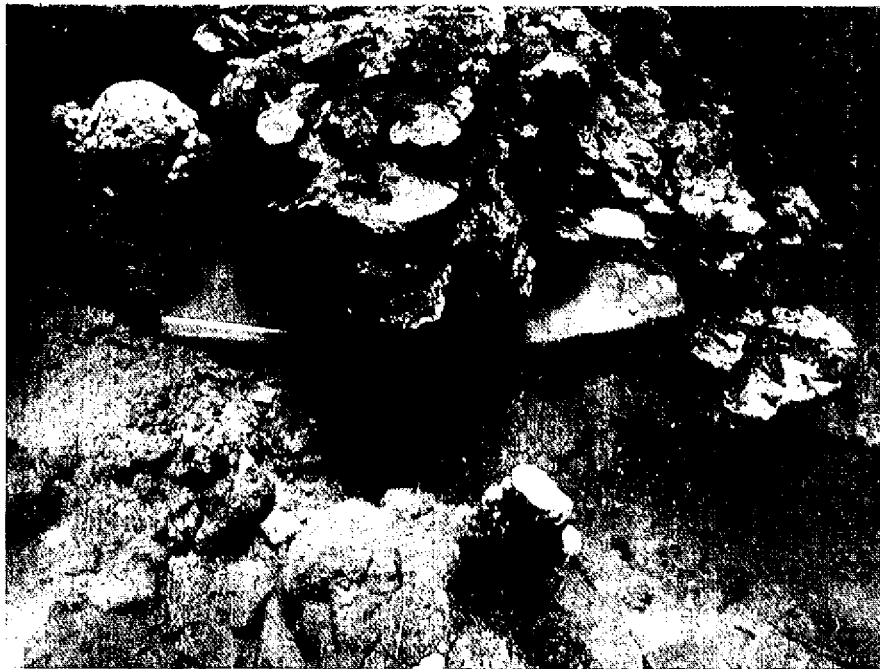


Fig. 9.129. Feature 1, copperclad container on LEONORA. (NPS photo by Larry Murphy)



Fig. 9.130. Toni Carrell swimming through wreck of FUJIKAWA MARU during 1981 assessment dives. (NPS photo by Dan Lenihan)



Fig. 9.131. Ready box for gun on NEW MARU with some shells freshly removed--1981. (NPS photo by Toni Carrell)

The subject report was entitled "The Utwa Harbor Wreck Site: A Shipwreck Evaluation and Management Report" by Daniel J. Lenihan, Toni Carrell and Larry Murphy, 1981, and was reproduced for very limited distribution to the concerned agencies. This document was then used, almost in its entirety, as the prime component of a publication edited by Scott Russell as Report Number 15 in the Micronesian Archaeological Survey series. It is entitled Of Wooden Ships and Iron Men: An Historical and Archaeological Survey of the Brig LEONORA.

The latter document includes the Ehrlich history of LEONORA and Bully Hayes and an additional brief report by Lenihan on a trip to Scripps Institution and the STAR OF INDIA Museum in San Diego to document artifacts removed from the site in 1967 by the crew of a Scripps vessel (Figure 9.123). Researchers desiring more detailed information on the 1981 NPS site work should consult this document, which is available in the usual professional repositories. Original photographs and drawings and some black-and-white videotape are retained by the NPS, SCRUI, in Santa Fe.

Chuuk (Truk)

We referred to these islands as Truk in the earlier portions of this volume because of keeping to contemporary usage for historical accuracy. In our discussions of present day archeological research, we defer to the islanders' preferred usage of Chuuk. Chuuk Lagoon is probably the most famous site for shipwrecks among sport divers in Micronesia. Much has been written about Chuuk in books (e.g., Rosenberg 1981, Rosenberg and Graham 1981, Bailey 1982) and magazines including National Geographic magazine. The SCRUI visited only some of the sites briefly over a 3-day period in 1981 and cannot meaningfully add to the body of information presently easily available in other forms. It does appear that Chuuk's management of shipwrecks as historical resources has received mixed reviews as pioneer programs often do. At press time for this report, there seems to be some action taking place by the administration of Chuuk to reevaluate the submerged cultural resources base and existing management structure. There are also serious allegations of increasing attrition to the sites. Neither of the claims can be verified by the research team at this time; however, it should be clear that attrition to Chuuk's submerged cultural resources will eventually result in erosion of the island's economic base.

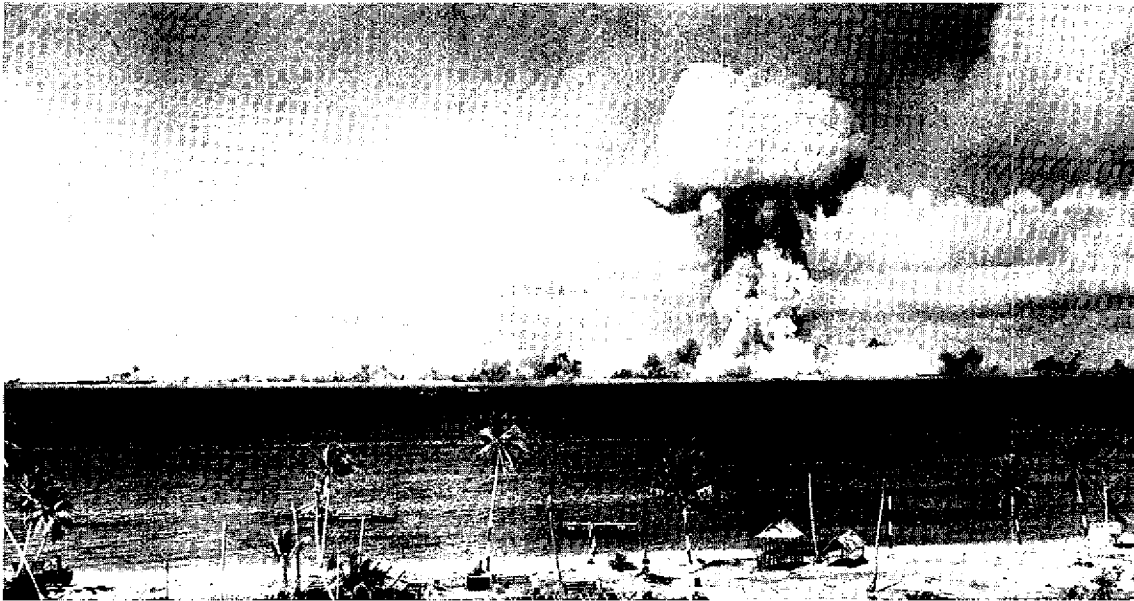


Fig. 9.132. Mushroom cloud rising from "Able," the first atomic explosion at Bikini during Operation Crossroads. (Photo courtesy of National Archives)



Fig. 9.133. NPS archeologist Larry Nordby illustrating remains of USS SARATOGA at Bikini. (NPS photo by Larry Murphy)

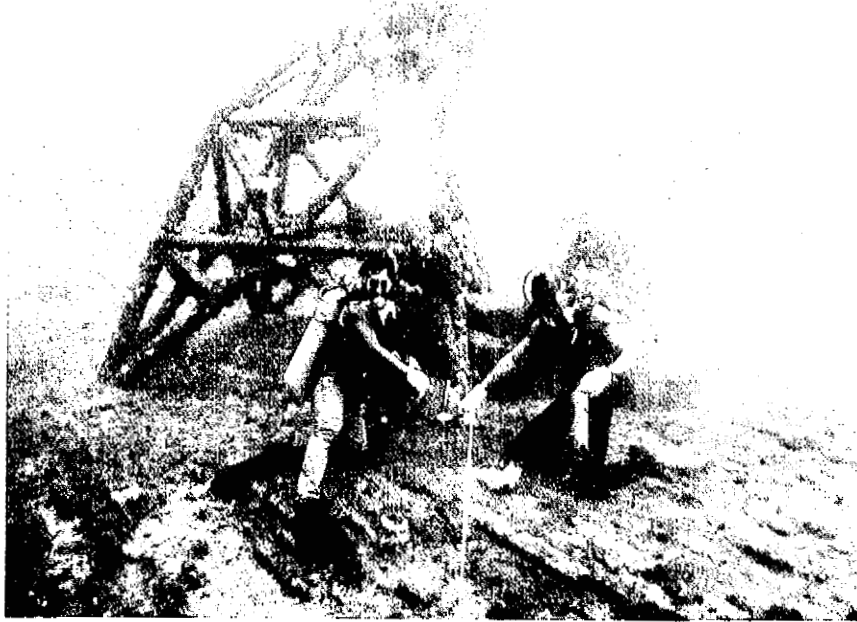


Fig. 9.134. Bikinian divers working with NPS/Navy team on the USS SARATOGA. They are measuring in the location of a "Christmas tree," a specially designed tower for holding blast gauges and other test instruments. (NPS photo by Larry Murphy)

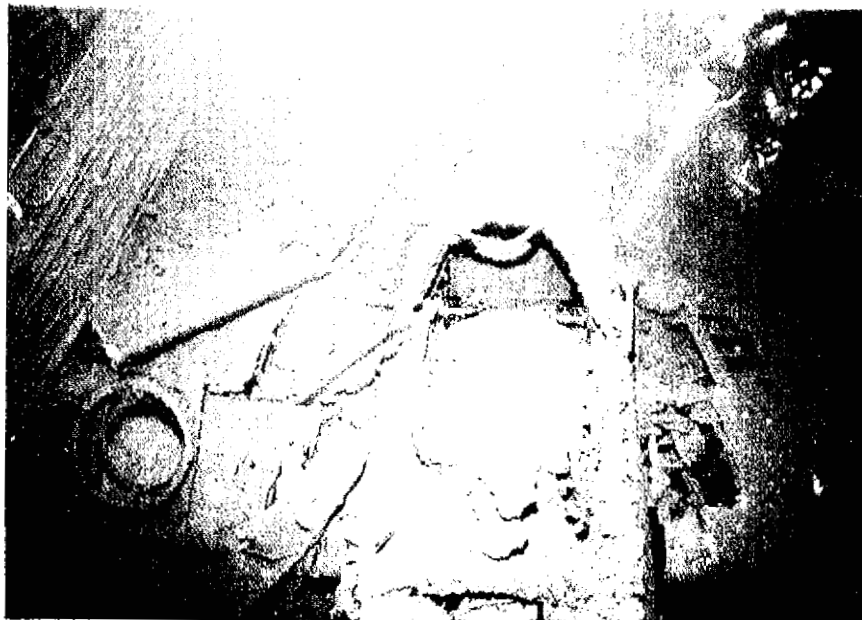


Fig. 9.135. Dan Lenihan shining light into cockpit of one of three "Helldivers," which can be seen when penetrating hangar deck of the SARATOGA. (NPS photo by Larry Murphy)

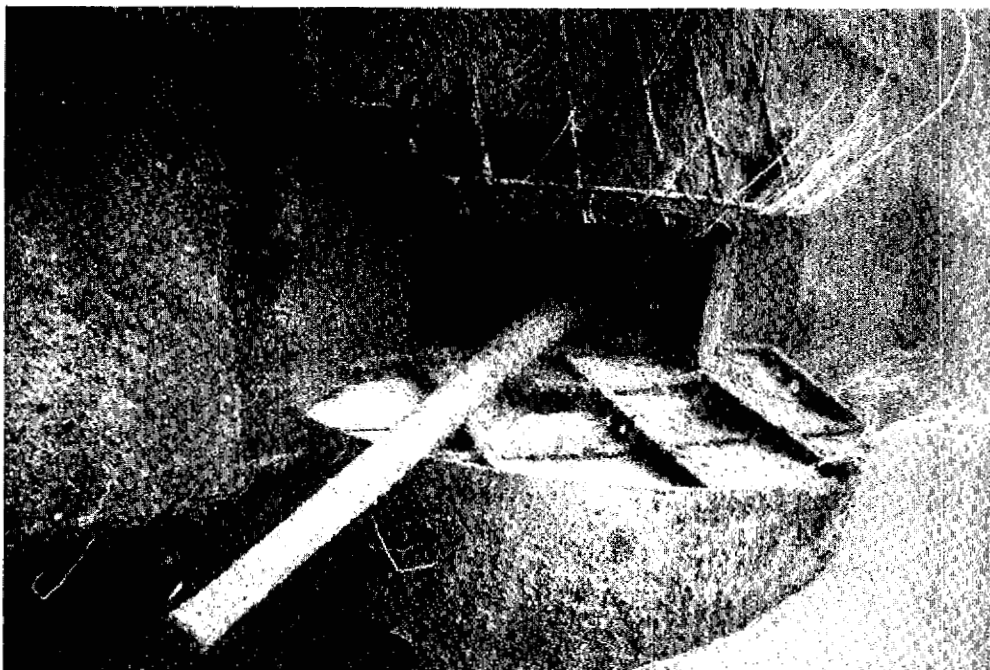


Fig. 9.136. A 5-inch gun protrudes from a forward casemate on the battleship USS ARKANSAS in Bikini Atoll Lagoon. It lies upside down as does Japanese battleship NAGATO close by. (NPS photo by Larry Murphy)

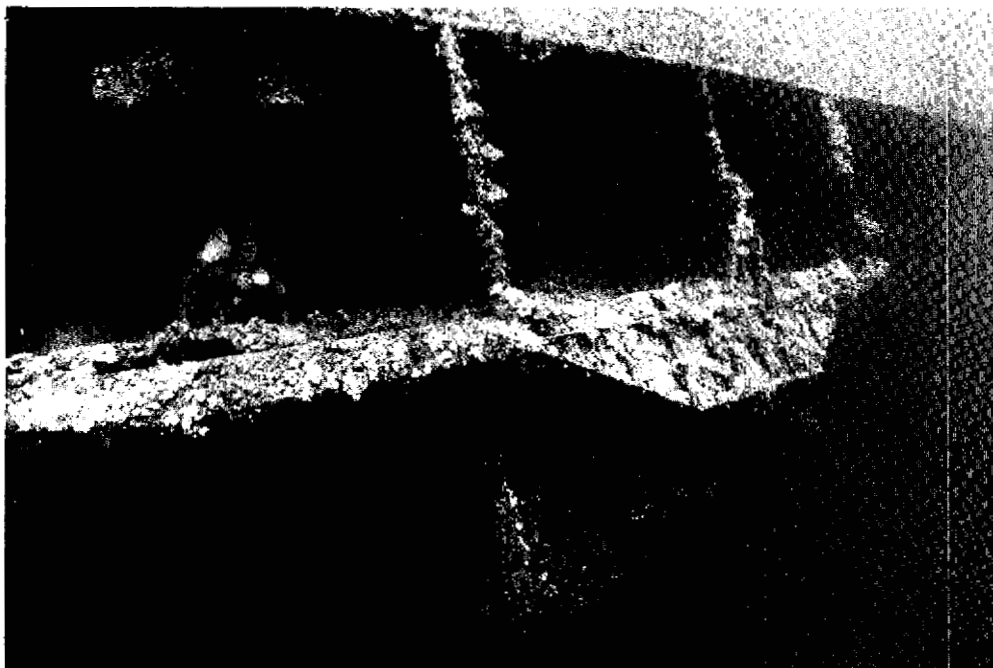


Fig. 9.137. PRINZ EUGEN survived two atomic tests at Bikini but overturned in Kwajalein Atoll. (NPS photo by Larry Murphy)

Administrative Status

Cultural sites in the Federated States of Micronesia are under the jurisdiction of the various states and are accorded protection under legislation in force on the islands.

Marshall Islands

Bikini and Kwajalein

Of the 23 known ships to have sunk in and around the island of Bikini, only one predates World War II. An unidentified ship, most likely involved in trading, was reported wrecked in the late 1850s (Ward 1967(4):327). All of the remaining ships were involved in the atomic testing program of the late 1940s. Twenty of the ships sunk during the test are American, while two are Japanese; each was involved in the Pacific theater of war (refer to Table 7.1).

In August 1989 and April 1990, the NPS, SCRU, conducted documentation dives on several ships in Bikini Atoll Lagoon that had been sunk as a result of atomic bomb tests during Operation Crossroads in 1946 (Figure 9.132). The work was done at the request of the Bikini Council and the Department of Energy's contracting firm, Holmes and Narver.

A detachment of U.S. Navy personnel from Pearl Harbor located and buoyed the sites, and NPS and Bikinian divers drew and photographed the ship remains (Figures 9.133, 9.134 and 9.135). The National Geographic Society also helped with the photodocumentation.

Twelve large ships and facility barges lie at the bottom of the lagoon plus an additional dozen or so landing craft, most of the latter being some distance from the test array. Many of the ships that survived the Operation Crossroads tests were towed to other points for decontamination and/or eventual sinking in deep water. Among the latter was the PRINZ EUGEN, which eventually overturned and sank at Kwajalein with its screws visible above the water's surface.

During the ship study, 6 of the 12 larger ships at Bikini were dived and to various degrees were recorded along with 3 of the landing craft. PRINZ EUGEN was additionally dived on two occasions by the team while they were passing through Kwajalein.

Most of the recording time was concentrated on USS SARATOGA, which is the only aircraft carrier known to be within range of sport divers. Additionally, some work was done on HIJMS NAGATO, flagship of the Japanese Navy at the time of the attack on Pearl Harbor; USS ARKANSAS (battleship); USS

PILOTFISH (submarine); USS GILLIAM (armed transport); and Y060 (yard oiler).

Besides mapping and photo documentation of the sites for historic preservation purposes, the NPS conducted an evaluation of the ships for use as the focus of a marine park. The Bikinian people are considering development of the lagoon as a diving attraction and have requested an assessment of the ships' potential in that regard.

A comprehensive report on this project is scheduled shortly for publication in the same series as the present report. It will be entitled The Archeology of the Atomic Bomb: A Submerged Cultural Resources Assessment of the Sunken Fleet of Operations Crossroads at Bikini and Kwajalein Atoll Lagoons by James P. Delgado, Dan Lenihan and Larry Murphy.

The reader is referred to that document for an in-depth discussion of the shipwrecks of Bikini. A detailed map of USS SARATOGA from these views will be available in that report in addition to many photographs and narrative discussions of the site visited. It is anticipated that Bikini will become the focus of major diving use once the dramatic nature of the site and the apparent lack of residual radiation problems become better understood by the general diving public.

No shipwrecks other than PRINZ EUGEN were dived by the study team at Kwajalein Atoll. Many are there as a result of fighting during World War II or surrounding deep water after Operation Crossroads. There is a very active diving club on Kwajalein and there are several popular publications that describe the wrecks and diving activity on them. It is not clear what the policy is in regards to protection or interpretation of the sites as historical resources but it is evident that a systematic survey of the sites would be beneficial.

CHAPTER X.
OTHER SUBMERGED CULTURAL RESOURCES
AND
UNDERWATER COMPONENTS OF LAND-BASED SITES:
THE HISTORICAL RECORD

By Toni L. Carrell, Don Boyer and Tim Rock

Introduction

This chapter is devoted to a discussion of the wide variety of other types of submerged cultural resources and underwater components of land-based sites. These sites range from prehistoric villages, fishing and quarrying sites, and caves to World War II equipment and airplanes. An effort has been made to consider as many different potential types as possible, based upon the historical record, that is, within the context of past human activity and archival documentation.

As in Chapter 8, the information is presented to permit a quick understanding of the extent and multiplicity of resources that may be present. Although neither comprehensive nor exhaustive, the initial overview is intended to be representative. The overview is followed by a brief discussion of sites that were specifically investigated in the field. They illustrate the variety of submerged cultural resources in the islands.

Site Types, Present or Potentially Present

Prehistoric Sites

The geologic origins of the islands, either volcanic or uplifted coral, and plate tectonics have influenced the ability of archeologists to discover the earliest sites of human habitation in Micronesia. It is presently believed that initial occupation was along the coasts and that these sites are now submerged. This view is supported by the knowledge that the western edge of the Philippine plate is dipping under its adjacent plate, which results in widespread subsidence in the islands. The volcanic and limestone origins of the islands also provided early peoples with a

honeycomb of deep and shallow caves perfect for habitation. Caves have always been used for shelter and have often been the only sources of reliable fresh water. In the islands of Micronesia, caves continued to be used through World War II. Some of the best evidence supporting early human occupation in the islands has come from excavations in and near caves.

Many caves are known and have been explored on the islands; fewer are known underwater. Although to date no prehistoric sites have been discovered in a submerged cave, it is accurate to say that few or no systematic archeological investigations have been conducted either. Completely or partially submerged caves hold the best potential for the discovery of early prehistoric sites.

Plate tectonics has also contributed to the submergence of prehistoric villages on low coral atolls. Three villages, all in Belau, are described in oral histories as sinking beneath the ocean. The site of one village in Belau was briefly examined in 1988 with no positive results. Another very well-known site that is partially submerged is Nan Madol in Pohnpei. This site has been undergoing extensive archeological investigations for several years. Like submerged caves, shallow submerged reefs may hold evidence of early human habitation in the islands. Oral histories may be the best clues to the locations of these ephemeral sites.

Prehistoric interisland migration, commerce and communication led to other types of sites. When the people of Yap sailed their large canoes to Belau to quarry the stone money they so highly prized, they spent months away from their island home. On Belau they continued to practice their traditional food-gathering and fishing. Evidence of one type of fishing strategy can be found in the presence of coral-lined fish traps on the shallow offshore reefs of Babeldaob. These low walls of mounded corals differ markedly from traditional Belauan fish weirs, which are made of organic reeds bent into a basket-like shape.

The Yap stone money quarries on the island of Babeldaob and Garreru suggest another type of site, that of landings or docks where the numerous large canoes could be kept. The formidable task of travelling to Belau, quarrying the huge slabs of stone and shaping them into smooth rings required many people and canoes. The same quarries were used year after year, which suggests traditional landings along the shoreline.

Elsewhere on Belau, prehistoric villages built in the interior of Babeldaob adjacent to streams or mangrove swamps quite often have well-developed stone docks. Between 1979 and 1981, six prehistoric village sites with docks were

identified during preliminary archeological surveys of Babeldaob.

Wherever people gather, wherever people land or moor their watercraft, the potential exists for the accidental loss of equipment and the purposeful deposition of refuse. Submerged prehistoric refuse areas adjacent to villages, landings or docks have been investigated as potential sites. These sites would probably contain only the remains of broken or lost ground-stone tools and other more durable artifacts such as clamshell utensils and ceramics.

Finally, there are the tombolo or pier-like features constructed of coral that connect two small islets. These features may have been used to increase the living area available and to facilitate access between adjacent islets. This site type has been found in Belau and may be present elsewhere in the islands of Micronesia.

Historic Sites

As soon as the first Europeans arrived in the Pacific, they began to add to the potential range of sites. The process of exploration and discovery was a difficult one, and the many shallow reefs and low atolls were perfect ship traps. Grounding certainly occurred, and with that the loss of anchors and the casting-off of equipment, ballast or cargo to lighten a ship and free it.

Traditional prehistoric landings very likely continued into the historic period. They may have been improved with the addition of Western-like piers or docks or, as likely, stone or coral rubble docks.

The arrival of Spanish colonial masters also brought the construction of small forts on the island of Guam. Built along the coastline, refuse areas below them may contain a variety of period artifacts.

Europeans introduced iron tools and other more durable items to the islanders. Refuse areas adjacent to contact and colonial-period villages and traditional landings may contain the remains of these Western goods. As copra production and general trade increased, so did the potential for the accidental loss of equipment and materials associated with this activity.

The whaling era dramatically impacted the lives of the islanders. Coming into port to obtain water, wood and women, these sailors added further to the archeological record. Equipment used in whaling that could not be repaired, refashioned into something useful, or traded may have been

often tossed into the shallow bays or anchorages in the islands. Like modern anchorages, the same general area would be used during each visit, which would create an underwater midden of refuse. Ship's boats, used to transport people and supplies from the island proper to the ship anchored offshore, may have capsized, spilling their contents into the sea.

The development of sugar cane plantations and refining in the Mariana Islands suggests remains associated with that activity. In Saipan, a narrow-gauge railroad was used in the sugar cane industry. Railroad cars have been abandoned and dumped in Saipan Lagoon. Equipment used in the refining process was probably also dumped when it was no longer useable.

Fishing, an important part of the subsistence activity prehistorically, changed in the historic period. Japanese fishermen, organized into small fleets, roamed throughout the islands. Equipment losses associated with this activity are also possible.

Historic mining of phosphate, used in both fertilizer and in explosives, added another level of industrial refuse. The remains of ore cars, cable runs, ramps and chutes may be present. At Rota, equipment from the phosphate mine litters the shallow bay in an area called Cable Run. Phosphate mining occurred on Ngeaur (Angaur) in Belau, Banaba (Ocean Island) in the Gilberts and Nauru. Abandoned equipment associated with mining may be present immediately offshore of these steep islands.

Although World War I added the German cruiser CORMORAN to the archeological record, little thought has been given to the deposition of refuse from the ship during its long interment in Apra Harbor. World War II contributed both Japanese and American planes, tanks, landing craft, barges, pontoons, mines, unexploded ordnance, guns and cannon. After the war, thousands of tons of equipment were unceremoniously dumped in the ocean rather than transported back to the United States. One such dump site is located on the western coast of Guam; no doubt there are many others throughout the islands.

World War II planes may represent one of the most diverse collection of sites in the islands. American and Japanese Army and Navy aircraft numbering nearly 100 different types were used in the Pacific theater of war.

Japanese and American Aircraft¹

The early carrier attacks during World War II brought American and Japanese naval aircraft into battle for the first time. The general superiority of most Japanese aircraft in range and flight characteristics compared with their American counterparts in the first 2 years of the war is well documented in historical sources. The toughness of American aircraft allowed the American combat pilots to develop techniques in combat that at least held the line against fast and highly maneuverable aircraft such as the A6M Zero until American industry began to produce superior types of aircraft, which eventually swept Japanese aircraft from the skies during the latter half of the war.

The majority of aircraft downed in Micronesia from 1942-1945 were Japanese, and this ratio will certainly be reflected in the wrecks now found in the area. Considering the nature of the Japanese Navy's prewar training, the probability is high that aircraft lost to operational accidents or weather before the war remain to be found as well.

Japanese aircraft losses in the area include every type used during the war--fighters; bombers; torpedo bombers; long- and medium-range patrol and reconnaissance aircraft, including several types of biplanes; transport and cargo aircraft; and cruiser float planes. The Imperial Japanese Navy was responsible for the defense of its Pacific possessions and used both land- and sea-based forces that were "quantitatively and qualitatively the most important Japanese Air Force during the Pacific War...and...bore the brunt of the fighting against the Allied Forces..." (Francillon 1979:37). For this reason, most of the Japanese aircraft wrecks known in Micronesia are naval types.

However, Japanese army aircraft types must also be considered in any historical research of aircraft wrecks in the area. Many of these army aircraft may have passed through the Pacific island areas, particularly in the Mariana and western Carolines, while island-hopping en route to the battle areas in the south in New Guinea. There are probably far fewer army-type Japanese aircraft in Micronesia than navy types because army aircraft were transient and none were permanently stationed on Micronesia's island bases. Japanese army aircraft were also designed to meet different operational criteria, that is, land warfare. Consequently,

¹The section on Japanese and American aircraft was written by Don Boyer.

army aircraft lacked the long range required of over-water operations, and many army pilots and their crews lacked the flight and navigation experience essential to operations with few or no landmarks. These limitations, though they did not prevent the army craft from staging through the Western Pacific, did prevent extended combat operations by army aircraft in the islands. Later in the war when the Kamikaze effort was in full swing, any available aircraft might be used in over-water operations; however, this was after the islands were lost.

The most likely areas for army aircraft are in the Marianas and western Carolines, islands on the direct route to the southern battlefields and near the Philippines. How well-used this route was is not clear, particularly as other routes originating at major army air force bases in Formosa and the Philippines were available and heavily used.

Combat losses of American aircraft during the Pacific battles were far fewer than their Japanese counterparts. The types of American aircraft lost were the same as those of the Japanese: fighters; dive-bombers; torpedo-bombers; long- and medium-range bomber and patrol craft; cargo and transport craft; and float planes from cruisers and battleships. Like those of the Japanese, American naval aircraft were the majority involved in combat in Micronesia. However, unlike their counterparts, U.S. Army aircraft, primarily medium- and long-range bombers, were also heavily involved in attacking Japanese island bases and suffering many combat and operational losses.

As the American forces captured the islands, many islands became forward airfields for long-range bombers and other aircraft used in support of the Pacific advance. This build-up of army and navy aircraft would have brought noncombat aircraft, such as cargo transports, into the area, and operational losses of these types of aircraft should also be considered possible in future research. The advent of American air bases and naval facilities also added more materiel to the area when wrecked or worn-out aircraft were dumped at sea around all the American-occupied island areas.

Accurate accounting of aircraft losses to both sides during each of the combat operations is outside the scope of this publication. Even careful modern historical research, such as Lundstrom's The First Team, which has the benefit of much Japanese data not previously available, cannot account for all losses. Wartime combat reports, made in the heat and stress of battle, can only be considered a starting point for research, which makes the archeological research of aircraft wrecks found in Micronesia particularly important for both cultural and historical reasons.

American aircraft are, for the most part, well documented in both manufacturers' records and military records, a great help in tracking U.S. aircraft found in Micronesia. However, the same is not true for Japanese aircraft. The sport diver's common habit of stripping parts off aircraft wrecks is thus of deep concern to professional archeologists, as well as historians, because it complicates identification of aircraft models within a type and can easily prevent any possibility of tracing the aircraft back to its origins with a particular air group or pilot. The preservation and interpretation ethic of archeology is particularly important to the history of aircraft in the Pacific because aircraft are more fragile and less easily traced in the historical records than are ships.

Air losses on both sides are only briefly covered elsewhere in this publication. A representative list of Japanese types most commonly operating in Micronesia is provided in Table 10.1. Some are not well known or were not found in combat roles or in great numbers during the Pacific war.

Table 10.1. Representative List of Japanese Planes Lost in Micronesia

<u>Code Name</u>	<u>Japanese Name and Type</u> ²
ALF	Kawanishi E7K, navy type 94 reconnaissance seaplane
BABS	Mitsubishi Ki-15, army type 97 command reconnaissance plane; Mitsubishi C5M, navy type 98 reconnaissance plane
BETTY	Mitsubishi G4MI/G4M3, navy type 1 attack bomber; Mitsubishi G6M1, navy type 1 wingtip convoy fighter; Mitsubishi G6M1-K, navy type 1 large land trainer; Mitsubishi G6M1-L2, navy type 1 transport
CLAUDE	Mitsubishi A5M, navy type 96 carrier fighter
DAVE	Nakajima E8N, navy type 95 reconnaissance seaplane

²From Japanese Aircraft of the Pacific War, Rene J. Francillon.

<u>Code Name</u>	<u>Japanese Name and Type</u>
DINAH	Mitsubishi Ki-46, army type 100 command reconnaissance plane
EMILY	Kawanishi H8K, navy type 2 flying boat
GEORGE	Kawanishi N1K1-J/N1K5-J, navy interceptor fighter Shiden and Shiden Kai
HAMP	Mitsubishi A6M3, navy type 0 carrier fighter model 32 (this aircraft was first coded HAP, then HAMP, and finally ZEKE 32)
HELEN	Nakajima Ki-49, army type 100 heavy bomber Donryu
IRVING	Nakajima J1N1-C and -R, navy type 2 reconnaissance plane; Nakajima J1N1-S, navy night fighter Gekko
JAKE	Aichi E13A, navy type 0 reconnaissance seaplane
JILL	Nakajima B6N, navy carrier attack bomber Tenzan
KATE	Nakajima B5N, navy type 97 carrier attack bomber
LILY	Kawasaki Ki-48, army type 99 twin-engined light bomber
LIZ	Nakajima G5N, navy experimental 13-Shi attack bomber Shinzan
MAVIS	Kawanishi H6K, navy type 97 flying boat
MYRT	Nakajima C6N, navy carrier reconnaissance plane Saiun
NATE	Nakajima Ki-27, army type 97 fighter
NELL	Mitsubishi G3M, navy type 96 attack bomber; Yokosuka L3Y, navy type 96 transport
NICK	Kawasaki Ki-45 KAI, army type 2 two-seat fighter Toryu
NORM	Kawanishi E15K, navy type 2 high-speed reconnaissance seaplane Shiun

<u>Code Name</u>	<u>Japanese Name and Type</u>
OSCAR	Nakajima Ki-43, army type 1 fighter Hayabusa. Known for a time in China-Burma-India theatre as JIM.
PAUL	Aichi E16A, navy reconnaissance seaplane Zuiun
PEGGY	Mitsubishi Ki-67, army type 4 heavy bomber Hiryu
PETE	Mitsubishi F1M, navy type 0 observation seaplane
RUTH	Fiat B.R.20, army type I heavy bomber
SALLY	Mitsubishi Ki-21, army type 97 heavy bomber (formerly JANE)
SONIA	Mitsubishi Ki-51, army type 99 assault plane
TABBY	Douglas L2D, navy type 0 transport
THALIA	Kawasaki Ki-56, army type 1 freight transport
THERESA	Kokusai Ki-59, army type 1 transport
THORA	Nakajima Ki-34, army type 97 transport; Nakajima L1N, navy type 97 transport
TOJO	Nakajima Ki-44, army type 2 single-seat fighter Shoki
TONY	Kawasaki Ki-61, army type 3 fighter Hien
TOPSY	Mitsubishi Ki-57, army type 100 transport; Mitsubishi L4M, navy type 0 transport
VAL	Aichi D3A, navy type 99 carrier bomber
WILLOW	Yokosuka K5Y, navy type 95 intermediate trainer
ZEKE	Mitsubishi A6M, navy type 0 carrier fighter
ZERO	Mitsubishi A6M5

Since the close of World War II, commercial shipping, fishing, passenger and airline traffic have continued to add potential to the archeological record. Major ports, such as Apra Harbor and Ngemelachel (Malakal), and minor ports at

each of the islands continue to serve as the focus of commerce. Equipment and tools dropped from the ships that bring consumer goods and tourists to the islands are creating modern middens. Continued dumping of refuse, most of it not biodegradable, will lead archeologists of the future to categorize our era as the pop-top horizon or the middle plastic.

Known Sites Not Investigated

Mariana Islands

A wide variety of the sites span the period from early Chamorro habitation of the island, predating the arrival of Europeans in 1520, through the end of World War II.

Saipan

Caves³

This island has both land and underwater caves. All hold the potential for archeological remains from the prehistoric and historic eras.

One well-known site is that of the Japanese Last Command Post. The site features natural caves and fortifications where the Japanese held out to the end in a brutal battle that took many lives on both sides in July of 1944. The post is actually a cave fortified with cement. In the front, there is a commanding view of the sea and a collection of tanks, howitzers, machine guns and naval guns.

Kalabera Cave is a short distance from the command post. Like it, this is another gaping hole in the cliff line along south Kalabera cliff and sits about 300 feet above sea level. The mouth is about 30 feet high and can be entered only a short distance before it drops off steeply. This cave is reported to have much past historical significance, having been used during the Spanish period as a prison for Chamorros found guilty of felonious crimes.

Liyans Falingun Hanom is an underground stream cave. This cavern has an opening of about 25 feet and was used by the Japanese during the war as a bomb shelter. It is situated

³The discussion of cave resources in Saipan was written by Tim Rock.

about a half-mile south of Kalabera. The stream goes underground into the cave and may have been used during prehistoric times as well.

The grotto is a natural cave fed by the sea. A large boulder juts out near the center of the pool. The distance from the opening of the grotto to the floor of the cave is 54 feet, where an amazing natural formation is visible. There are three exits to the open sea where huge boulders rise up and overhead waves pound against the cliffs.

One other underwater cave is known to exist on Saipan; it is called Wing Beach Arch.

World War II Sites

A total of 36 sites in and around American Memorial Park and Saipan Lagoon were discovered. Two assessments were conducted at the American Memorial Park in Saipan, on October 28-30 and December 15-17, 1983. The general purpose of this assessment was to make a preliminary analysis of the submerged cultural resources within the park. The Micronesian Area Research Center sponsored an underwater assessment of Saipan Lagoon on December 3-5, 1984. These efforts were aimed at locating and identifying additional significant objects of historical value that might be lying on the lagoon floor.

As a result of these efforts, more than 50 sites were discovered, all dating to the post-1900 era. The vast majority are the remains of U.S. pontoons or barges. The shipwreck sites are discussed in Chapter 9, and the remains of railroad cars, two planes and a gun are discussed in Chapter 11. The sites presented below have not been documented; only their locations have been noted, and a preliminary identification has been made.

The remains of 28 American pontoons or barges also exist in the park. Their locations are identified below and on Figure 10.1.

Table 10.2. Key to Base Map of Other Known Sites in American Memorial Park

Site Number 3:	American fuel storage tank
Site Number 4:	Scattered debris
Site Number 5:	U.S. pontoon/barge, partially submerged
Site Number 6:	U.S. pontoon/barge, partially submerged
Site Number 7:	U.S. pontoon/barge, partially submerged
Site Number 10:	U.S. pontoon/barge, partially submerged
Site Number 12:	U.S. pontoon/barge, partially submerged

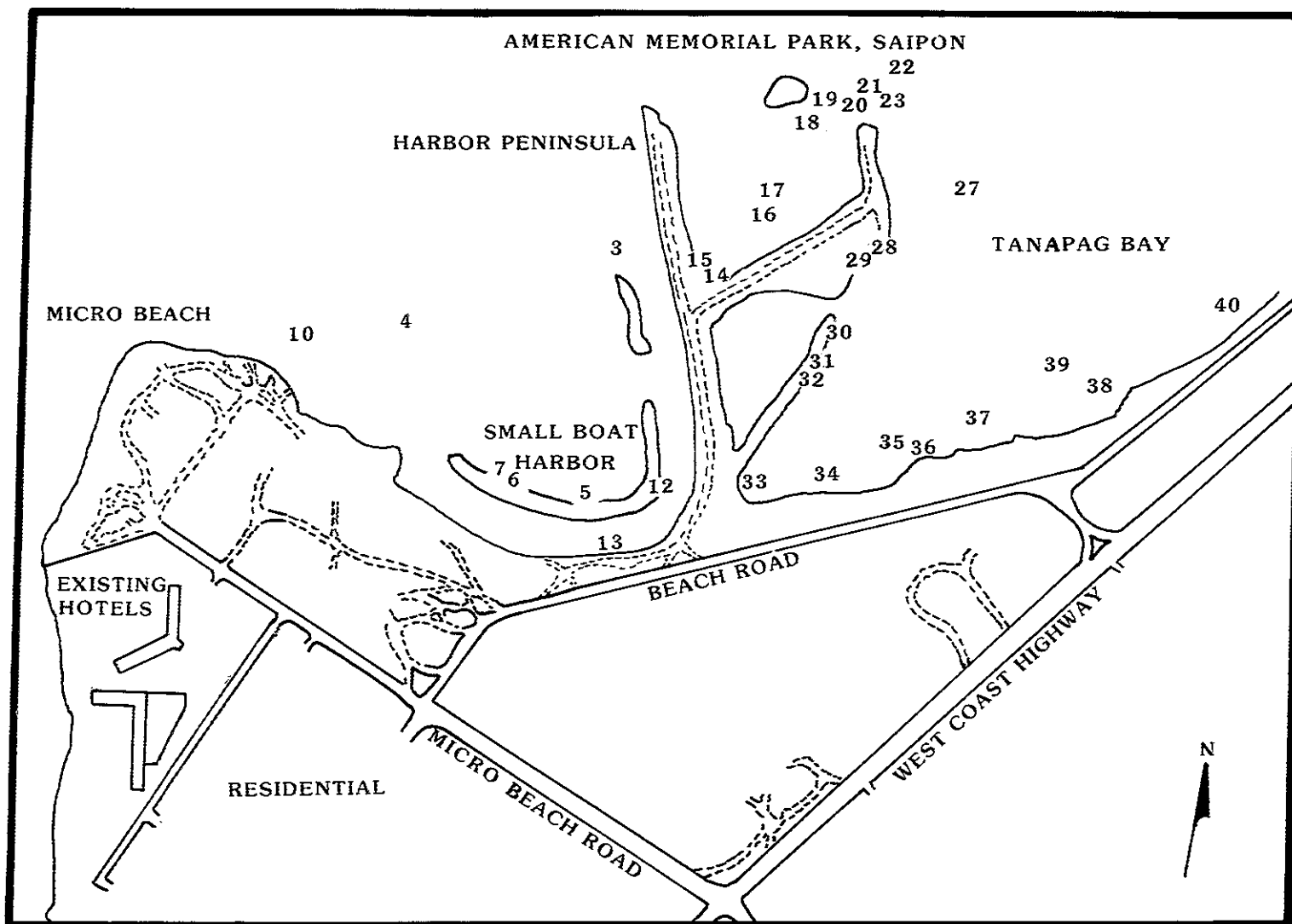


Fig. 10.1. Base map of other known sites not investigated in American Memorial Park, Saipan.

Site Number 13: U.S. pontoon/barge used as dock
 Site Number 14: U.S. pontoon/barge, submerged
 Site Number 15: U.S. pontoon/barge, partially submerged
 Site Number 16: U.S. pontoon/barge, submerged
 Site Number 17: U.S. pontoon/barge, partially submerged
 Site Number 18: Scattered debris
 Site Number 19: U.S. pontoon/barge, partially submerged
 Site Number 20: U.S. pontoon/barge, submerged
 Site Number 21: U.S. pontoon/barge, submerged
 Site Number 22: Scattered debris
 Site Number 23: U.S. pontoon/barge, submerged
 Site Number 27: U.S. pontoon/barge, submerged
 Site Number 28: U.S. pontoon/barge
 Site Number 29: U.S. pontoon/barge, submerged
 Site Number 30: U.S. pontoon/barge, submerged
 Site Number 31: U.S. pontoon/barge, submerged
 Site Number 32: U.S. pontoon/barge, partially submerged
 Site Number 33: U.S. pontoon/barge, partially submerged
 Site Number 34: U.S. pontoon/barge, partially submerged
 Site Number 35: U.S. pontoon/barge, partially submerged
 Site Number 36: U.S. pontoon/barge, partially submerged
 Site Number 37: U.S. pontoon/barge, partially submerged
 Site Number 38: U.S. pontoon/barge, partially submerged
 Site Number 39: U.S. pontoon/barge, partially submerged
 Site Number 40: U.S. pontoon/barge, partially submerged

Two Sherman tanks were discovered during the 1984 survey of Saipan Lagoon (Figure 10.2). Only partially submerged, they lie about 300 yards from shore (Figures 10.3 and 10.4). These are in excellent condition and their turrets can be seen above the high-tide line from shore. Nearby are the skeletal remains of a U.S. landing craft, Site 9 (refer to Figure 10.2). It is in poor condition.

Rota

Caves⁴

On Rota, there is a honeycomb of limestone caves. Many sites, like the small caves overlooking Sasanhaya Bay, were used by the Japanese and have cannons still protruding from them.

The cave at Puntan Senhanom can only be reached by scuba divers. Located at the last point on the southwest coast of the Wedding Cake plateau before reaching the tip, this

⁴The discussion of cave resources in Rota was written by Tim Rock.

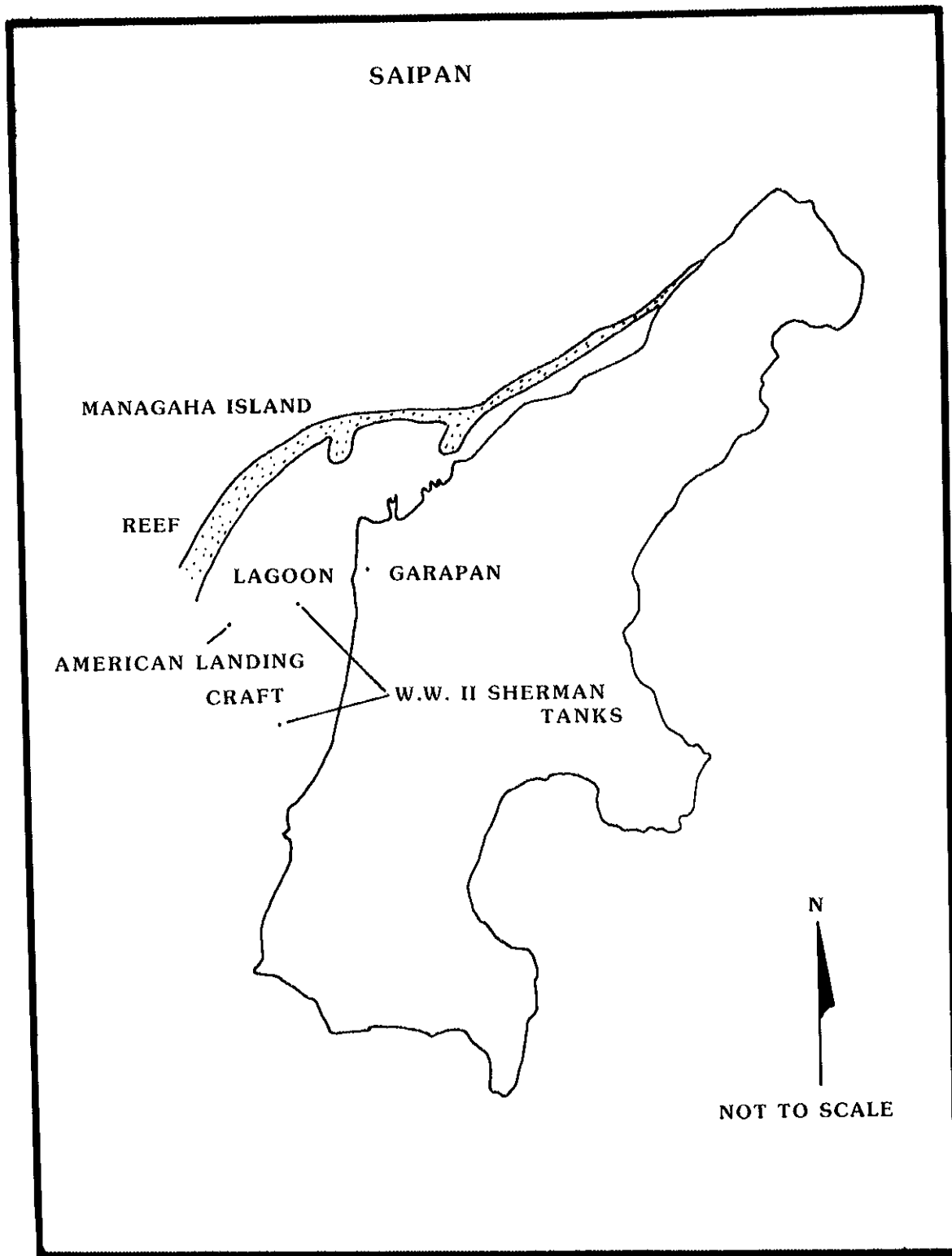


Fig. 10.2. Base map of other known sites not investigated in Saipan Lagoon.



Fig. 10.3. The partially submerged remains of two U.S. Sherman tanks lie 300 feet from shore in Saipan Lagoon. (Photo by Tim Rock)

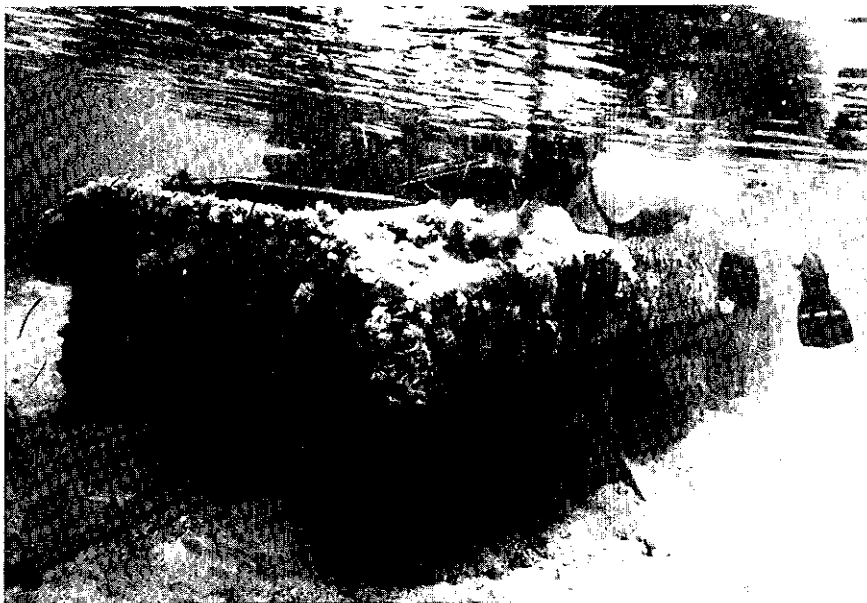


Fig. 10.4. The Sherman tanks in Saipan Lagoon are often visited by snorkelers. (Photo by Tim Rock)

underwater cavern opens to a sunlit inner pool. The mouth of the cave appears a deep blue from the surface and is approximately 30 yards wide. The sloping coral wall bottoms out near the cave entrance, which is between 40 and 60 feet deep. In the interior of the cave, large boulders take up space in the middle. The walls to the left rise up to an opening while the right leads back into a series of dark fissures. It is possible to climb out of the pool and sit along the edge in this grotto. Looking up, one sees the jagged edge of Wedding Cake plateau through the large opening.

In the village of Songsong, Tonga cave is marked by a park that leads to this historic site. This cavern has a huge entrance adorned by immense, overhanging stalactites. Following the surrender of the Japanese to the Americans during World War II, many Japanese families stayed here until they could be evacuated. They took the place of many of Rota's residents, who were being held prisoner on their island in this mammoth hole in the cliff line. There is also a network of Japanese caves under the village itself.

The Glyph Cave, named for its petroglyphs, is replete with prehistoric pictographs that date back to the first Chamorros. Evidence of past habitation is evident on the broad plain that is shrouded by cliffs on all sides except toward the open sea. Immense mortar stones line the trail, and pottery sherds litter the dry jungle floor. Clam-shells and ground-stone artifacts are also present.

A giant Taga stone is upright, with its capstone in place. Others had toppled but still remain in a row, evidence of the base of a structure. More Taga stones are a short distance away, all fallen but still in line and larger than the first one. This valley was also the home of Japanese during the war. In one area the immense Taga capstones are lined up bunker-style, facing the sea, apparently in preparation for a last stand that never came. Closer to the cliff line, a large basin several yards long and made of rocks is believed to be a kiln, built but never used. Sake bottles, pieces of dishes, teapots, and glass ampules are scattered around the site. However, no weapons or evidence of remains are present.

The cave is a long lateral and partially uphill walk to the base of the cliff line and a series of small caves. Some are inactive, and some are still dripping inside, forming crystalline rivers and stalagmites and stalactites. Pictographs are present that are similar to those on Guam at Gadaa's cave in Inarajan. Stick figures, apparently of people, predominate. Smaller "family" groups share the space with large strings of human forms. Other, larger, indistinct

drawings are painted on the rocks. They appear to take the form of animals. One particularly resembles a turtle.

Another underwater cave in Rota is at Tataacho Point. Although the only caves to exhibit prehistoric use are above water, they clearly demonstrate the extensive use these natural resources received prehistorically. To date, none of the underwater caves on Rota has yielded prehistoric remains.

Guam

Caves⁵

The old archeological site in the Pagat area of northeast Guam gives some insights into the lives of past residents of the island. Naturally protected by huge cliffs landward and a steep, rugged seawall, the people here apparently lived in relative isolation, unworried that enemies could attack.

Before reaching the cave, the trail widens, and there are many signs of a prehistoric village. Mortars are strewn along the trail. Clamshells used for drinking and utensils are prevalent. Standing latte stones give testament to the village site. There is also another latte site nearer the sea. The cliffs here are steep, and waves break below into a blue mist.

The cave is below the drop-off. The trail down leads to the mouth of this cavern that is thought to have provided the fresh drinking water for ancient residents. A stalagmite is believed to have been quarried from here to be used as one of the nearby latte bases. There is also evidence that Japanese stragglers may have held out here, using the cave for water and as a hiding place.

The first chamber is very shallow, but a squeeze through to the second room reveals a deep second chamber holding clear water that is normally about 10 feet deep. Guam's crystal-clear water offers a unique diving opportunity along the honeycombed northeastern coast. This geologic phenomenon holds much of the island's fresh water. The rain is filtered through the porous limestone and forms cool pools inside many caves.

A number of caves along the coast are in 10 to 15 feet of water. These caves are wide, high-ceilinged caverns accented

⁵The discussion of cave resources in Guam was written by Tim Rock.

by dripstone formations, stalagmites and stalactites. They are believed to have been sources for water for ancient Chamorros and possibly shelters for Japanese holdouts. Archeological excavations have discovered a variety of artifacts, and latte stone bases made of stalagmites or stalactites have been found at some dig sites.

Other submerged caves are Blue Hole and the Anae Caves.

World War II Sites

The popularity of sport diving and the interest in remains from World War II on Guam have resulted in the discovery of a variety of sites in the harbor. In July 1986, a survey of the harbor floor by Pelagos Corporation, in preparation for the installation of four fleet moorings (Pelagos 1986), added further information to the resource base. In addition to the five major shipwrecks, one positively identified airplane, and the possible remains of a second plane in the harbor, there are numerous other sites, predominantly the remains of landing craft and barges. These sites have not been documented; only preliminary identification has been completed. Their locations are based upon the work of Paul Edwards in 1979-1980. The number of each site was arbitrarily assigned by Edwards; the Guam Historic Preservation Office has continued to use Edwards' original list and designations. Those numbers are used here and on Figure 10.5 to avoid confusion.

Table 10.3. Key to Base Map of Other Known Sites in Apra Harbor

Site Number 4:	LCU--Piti back bay
Site Number 13:	Barge--Dry Dock Island
Site Number 14:	Barge--east of Dry Dock Island
Site Number 19:	LCU--Glass Breakwater
Site Number 20:	Barge--ABJ Lagoon breakwater
Site Number 23:	Barge--northeast of Adotgan Point
Site Number 24:	LCU--north of Orote
Site Number 25:	Barge--Glass Breakwater
Site Number 26:	Barge--Glass Breakwater
Site Number 27:	Barge--Glass Breakwater
Site Number 28:	Barge--northeast 26, 27
Site Number 30:	Barge--Piti channel

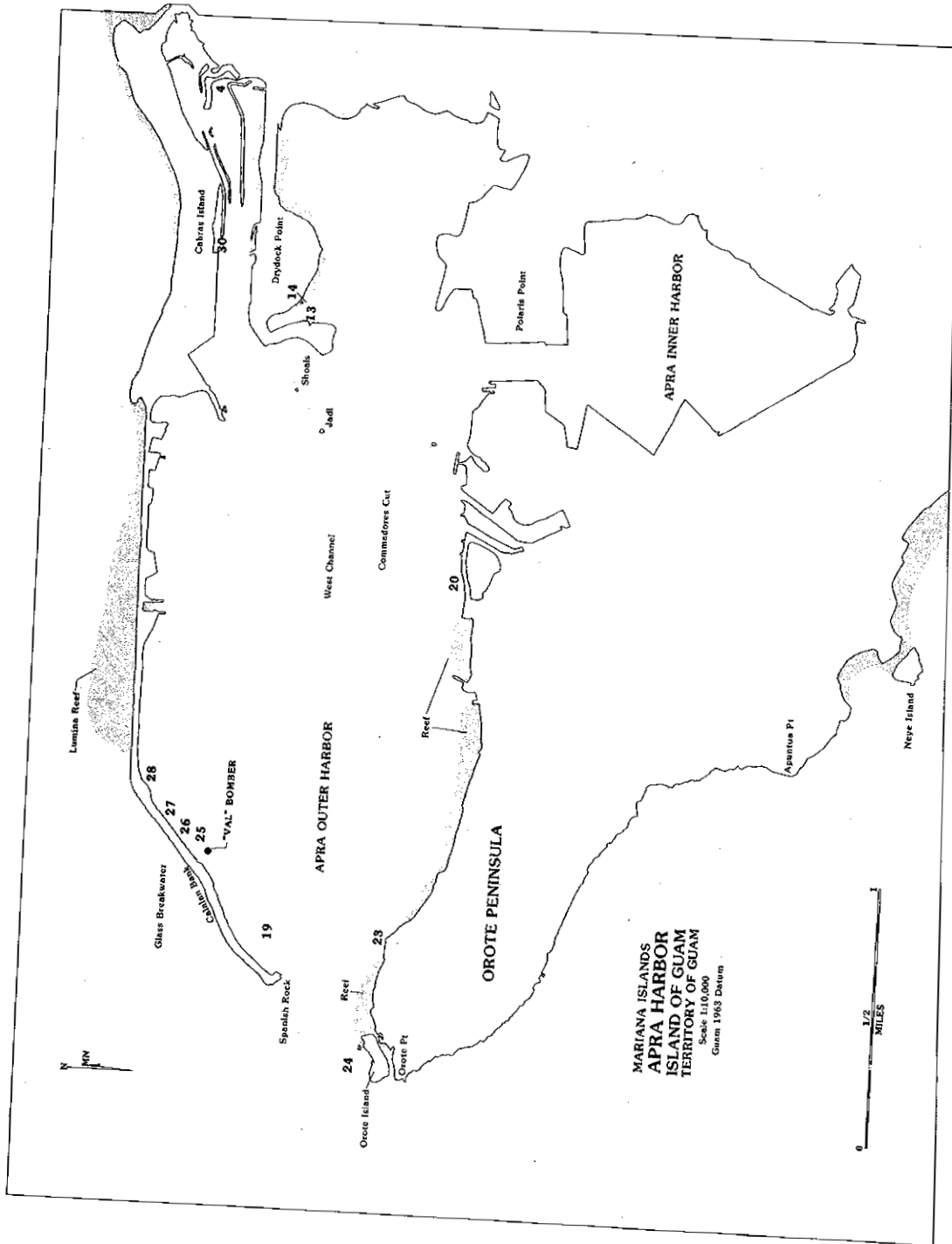


Fig. 10.5. Base map of other known sites not investigated in Apra Harbor.

Caroline Islands

Republic of Belau

Prehistoric Villages

Stories of sunken prehistoric villages are sprinkled in the oral history of the Belauans. Three prominent villages are mentioned: Ngibtal in Ngiwal State, Uchelbeluu in Irrai State and Ngeruangel in Ngcheangel State. Ngibtal is discussed in Chapter 11. The other villages, Uchelbeluu on the west side of Augulselu Reef and Ngeruangel at the reef on the far north of the archipelago (Figure 10.6), were never visited.

Prehistoric Yap Fish Traps

Called beng in Belauan, the fish traps built by Yapese when they came to Belau to quarry the large stone money are confined to the eastern side of Babeldaob. Several have been inventoried in Melekeok (refer to Figure 10.6). This type of trap is made from coral heads stacked in an outlining wall about 2 to 3 feet high. They are placed inside the reef where the water level stays 2 to 3 feet high at low tide. The Yap coral traps differ markedly from Belauan traps, which are made of bent reeds in a basket-like fashion.

Prehistoric Stone Docks

All of the stone docks on Belau are associated with the prehistoric period. Yawata (Chapman 1968:68-69) was the first scholar to attempt to understand village settlement. Like Chapman, he was struck by the apparent utilization of the interior of the larger islands before European contact. Yawata investigated the locations of abandoned villages and concluded that there was a movement from the coast to the interior. This movement was related to the construction of the large terrace systems in the interior and perhaps the need for defensible positions. Sometime before the arrival of Europeans, the people moved back to the coast.

The prehistoric villages in Irrai that were investigated by Gummerman, Snyder and Masse (1981) and that are built on streams invariably have stone docks associated with them. Stone-lined pathways connect the various activity centers in the village with the boat docks. The well-developed docks are located where channels through the mangrove swamp lead to the ocean. At one site, B:IR:1, the stones form a semicircular landing (Gummerman et al. 1981:37). Four sites in Irrai have this inland dock feature. Preliminary investigations in other states have uncovered similar docks

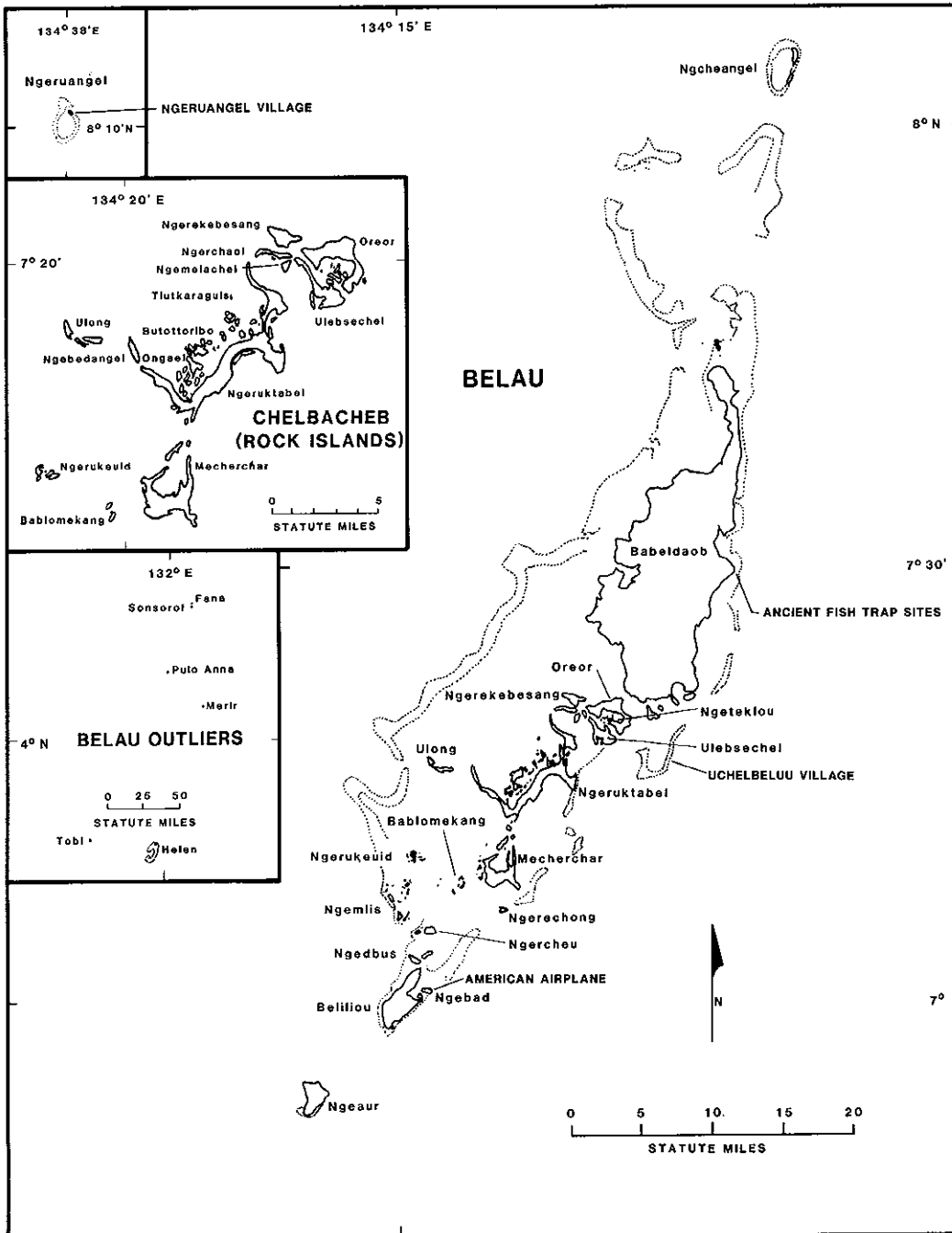


Fig. 10.6. Base map of other known sites not investigated in Belau.

at sites in Oreor, Ngchesar and Ngeremlengui (Gummerman et al. 1981:26-28).

Osborne (1966) also mentions the presence of tombolo, pier-like reef fragments connecting two islands. At the island of Ngerchur he described one such feature:

On the eastern shore of the tombolo are the remnants of, presumably, an aboriginal dock. A line of coral slabs parallel to the shore, now largely buried in the sand, was probably part of the structure. The pier remnant itself is not only an elongated grouping of stones 8 to 10 feet wide, which extends into the sea 20 to 30 feet and is at right angle to the line of stone in the sand. (Osborne 1966:294)

In addition to this example, Osborne also recorded another similar site on the southern island of Merir (Osborne 1966:49-50).

Caves⁶

Capped in an emerald crown of greenery, many of Belau's islands are pocketed with natural caverns and caves. One such feature is the Yap Cave, said to be the refuge of the seafaring people of Yap. These travelers came to Belau to quarry stone money and then to return the pieces by canoe to their island 400 miles away by open sea. The cave entrance is hidden on a small islet at the southern tip of Irrai State. Here they would dock their open-cargo canoes and rest after their long journey. On the western side of the island is the cave that holds great legendary significance for Belauans. It is also somewhat hidden and was formerly a place to hide women, children and the elderly during ancient wars. The entrance was guarded by two warriors.

Nearby are the quarry caves. The Yapese placed great value on huge, round discs they formed from aragonite that composes the walls of the caverns. The stone money discs may be seen partially completed in the several large caves of Metuker' ra Bisech Island.

⁶The discussion of cave resources in Belau was written by Tim Rock.

Belau has an intriguing archeological past. There are stone monoliths in Ollei far to the north, and on the isolated island of Ulong in south-central Belau there are caves few have seen. Figures and designs adorn the cave walls that sit high-up along the northeastern cliff line. Many of these glyphs resemble people, shields and possibly the sun. Their meaning and origin are being studied.

One cave that can be explored by both scuba diving and by foot is the Chandelier Cave. Located near Oreor, this shallow cave comprises many chambers and a high ceiling that rises above the water level, which allows divers to surface, talk and even take off diving gear and walk around in some of the chambers. Stalactites and stalagmites limit progress, but it is possible to explore a small tunnel. In all, there are four chambers that lead back to a large area where divers can again doff gear, get out of the water and walk around.

The entry is at a small cove in the Rock Islands about 20 to 25 feet through a jungle undercut.

Other underwater caves in Belau are Siaes Tunnel and a site called the Soft Coral Tunnel. To date, no evidence of prehistoric use of now-submerged caves has been found.

Planes

During the aerial attacks of World War II, on March 30-31 and April 1, 1944, a total of 2,645 sorties were flown from the Task Force 58 fleet carriers against the targets on Belau, Yap and Woleai. Of those, 1,426 were flown over Belau, and 401 tons of bombs and 35 torpedoes were dropped (Report of Carrier Based Strikes Against Pelau, Yap and Woleai, 30, 31 March, 1 April 1944:1). American aircraft did not strike a defenseless island; the Japanese launched a counterstrike and engaged U.S. forces in aerial combat.

During the 3-day operation, the American strike force sustained the loss of 25 combat aircraft and 12 operational aircraft. Japanese losses, however, were much heavier. A total of 110 aircraft were shot down; of that number 93 were shot down over Belau and the remainder were downed over deep water before the American strike reached the island. The planes shot down at Belau represent eight different types of aircraft used by the Japanese.

Table 10.4. Japanese Aircraft Shot Down Over Belau, March 30-31 and April 1, 1944

<u>Number</u>	<u>U.S. Code Name</u>	<u>Japanese Designation</u>
4	Tony	Kawasaki Ki-61, army
77	Zeke	Mitsubishi A6m, navy
3	Hamp	Mitsubishi A6Me, navy
3	Oscar	Nakajima Ki-43, army
1	Tojo	Nakajima Ki-44, army
1	Nate	Nakajima Ki-27, army
	Unidentified	
1	Pete	Mitsubishi F1M, navy
2	Betty	Mitsubishi G4MI/G4M3, navy

Sites of known but not identified airplane wreckage include the remains of American airplanes in Ngeruktable (Urukthapel) Anchorage, the island of Oreor, and on the north side of Garreau. Another Japanese airplane is known to have wrecked on the southwest side of Ngeruktable Island (Figure 10.7). Figures 10.8 through 10.14 illustrate the various planes lost in Belau.

Mines

During the aerial attacks of World War II, on March 30-31 and April 1, 1944, 10 percent of the effort went into minelaying. This was the first such mission from carriers (Action Report, Commander Task Force 58, Mining of Channel of Palau Islands on 30, 31 March 1944). The strategic harbors and channels that were mined included Ngemelachel (Malakal) and Ngell Channels, Kobesang Harbor, and the passage southeast of Ngeruktable (Urukthapel) Island, which is referred to as Sax Passage on some maps. During this effort, 25 Mark 10 Model 6 mines and 53 Mark 25 mines were laid.

Both types were painted with camouflage paint. The Mark 25 mines were a mottled sand color, said to be invisible to a diver more than 10 feet away. The Mark 25 could also be set to delay arming for as long as 35 days after being deployed. This mine was 22-7/16 inches in diameter and 89-1/2 inches long with the parachute and 82-1/8 inches long without it. It carried an explosive charge of 1,100 pounds of TNT or 1,235 pounds of Torpex. The Mark 10 Model 6 mine was described as a "needle-type, moored mine." It consisted of three parts: an anchor, case and firing mechanism and parachute. It was 21 inches in diameter, 118 inches long and weighed 1,850 pounds. Although the likelihood of any of the mines still being in and around Belau is limited, that possibility should not be discounted.

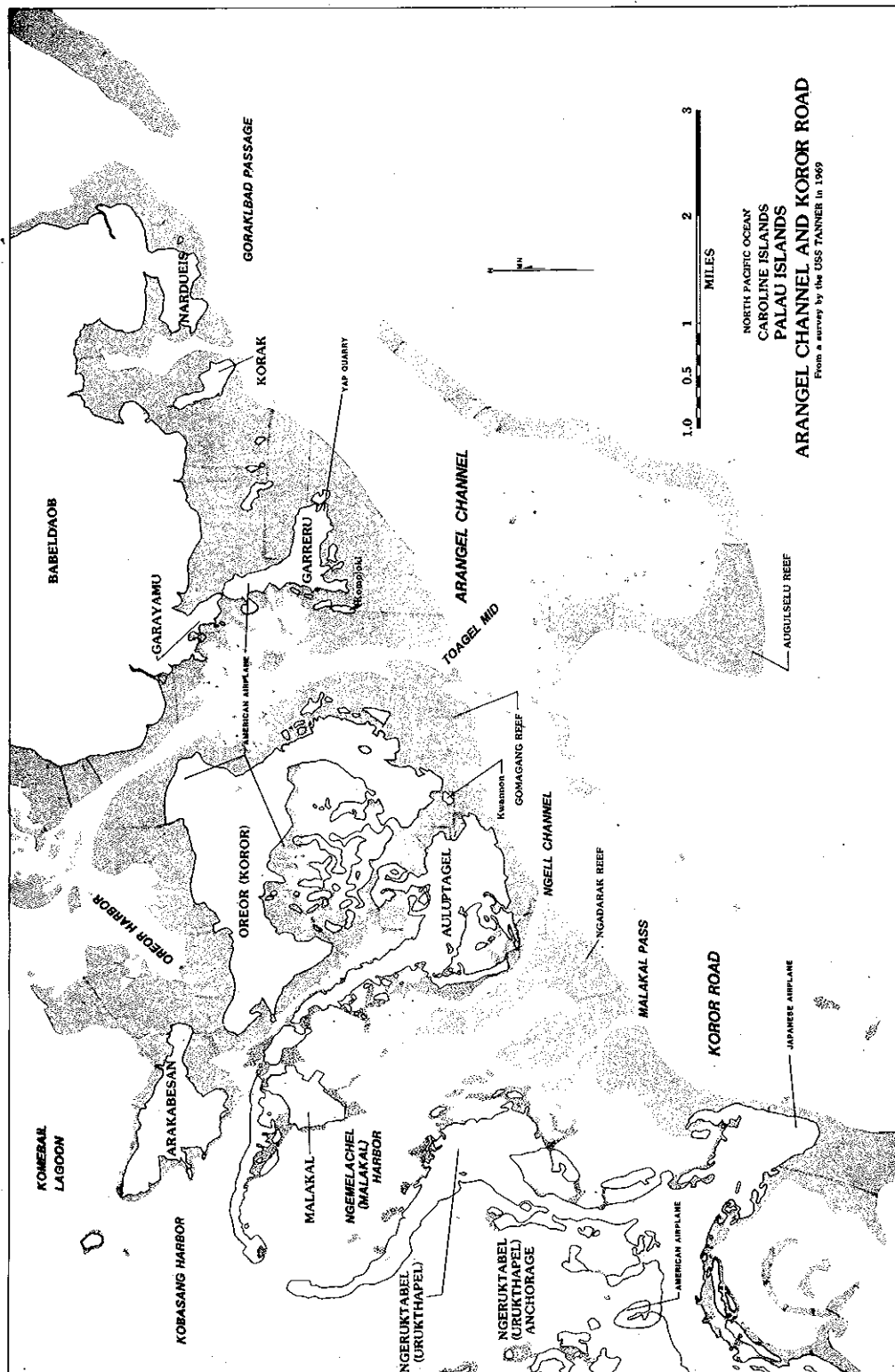


Fig. 10.7. Base map of other known sites not investigated in the central islands of Belau.

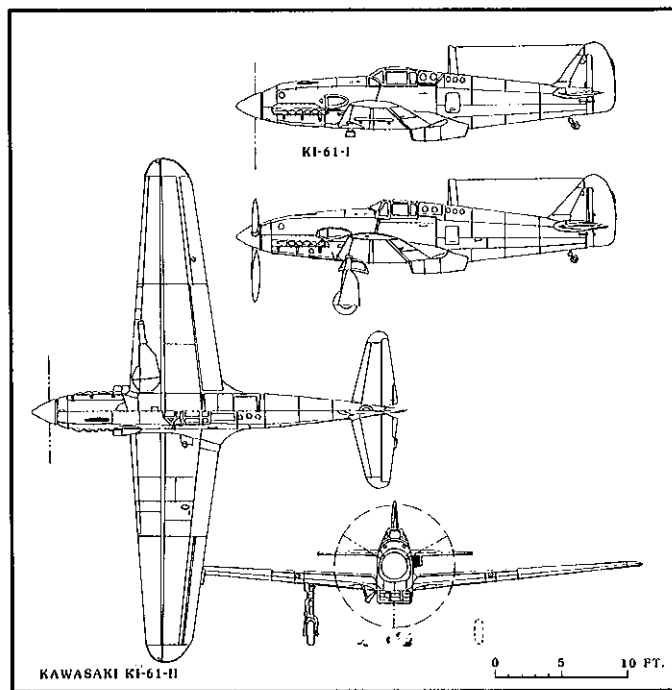


Fig. 10.8. Code-named Tony, the Kawasaki Ki-61 Army aircraft marked the first attempt by the Japanese to incorporate armor protection and a self-sealing fuel tank in their fighter aircraft. (Courtesy of Naval Institute Press)

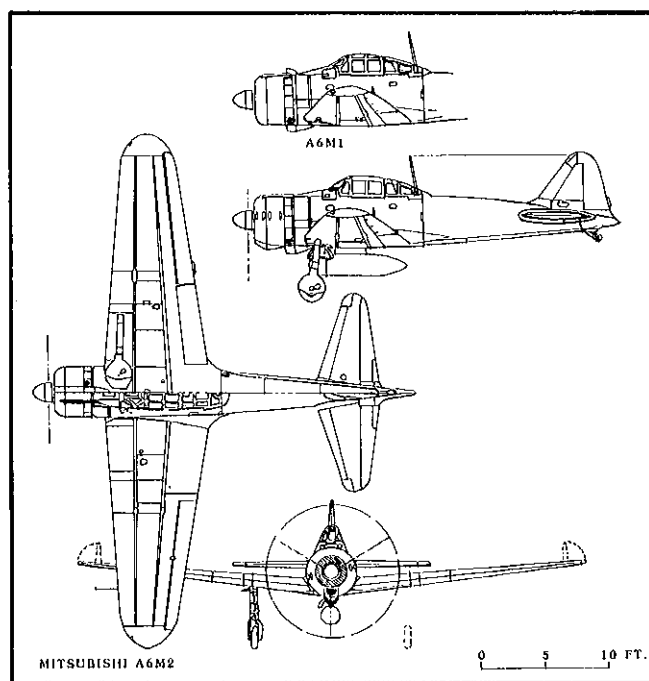


Fig. 10.9. The Zeke, initially built for combat in China in the 1930s, eventually evolved into more efficient models A6M4 and A6M5, known as the Zero. (Courtesy of the Naval Institute Press)

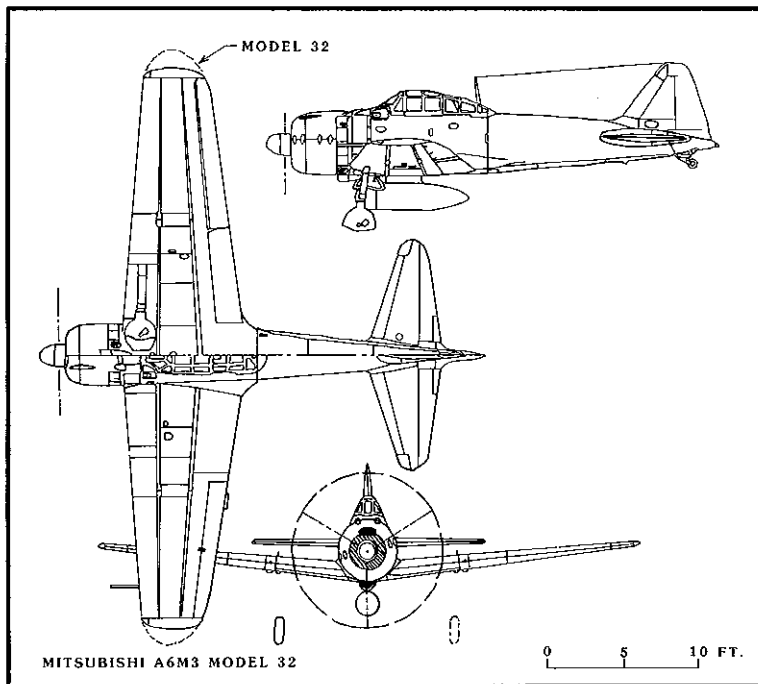


Fig. 10.10. This aircraft was first coded Hap, then Hamp, and finally Zeke 32. (Courtesy of Naval Institute Press)

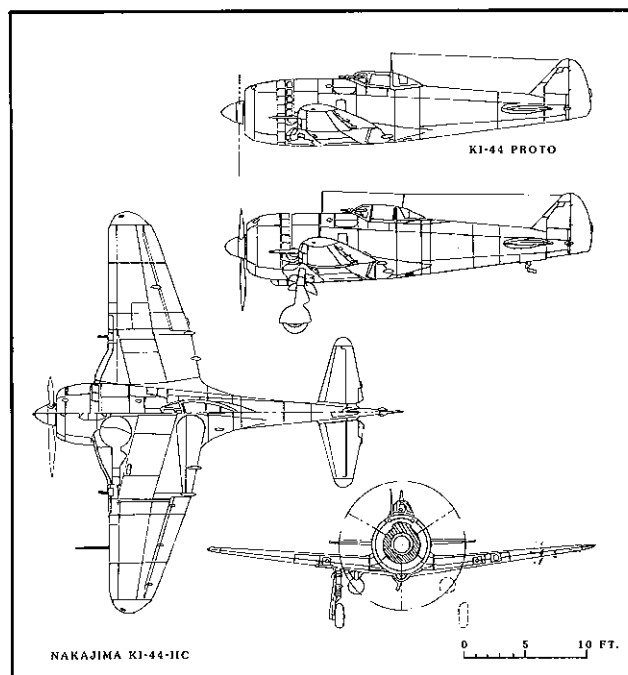


Fig. 10.11. Code-named Tojo and called by the Japanese Devil-Queller, this Army interceptor fighter was used in the defense of the Japanese homeland near the end of the war. (Courtesy of Naval Institute Press)

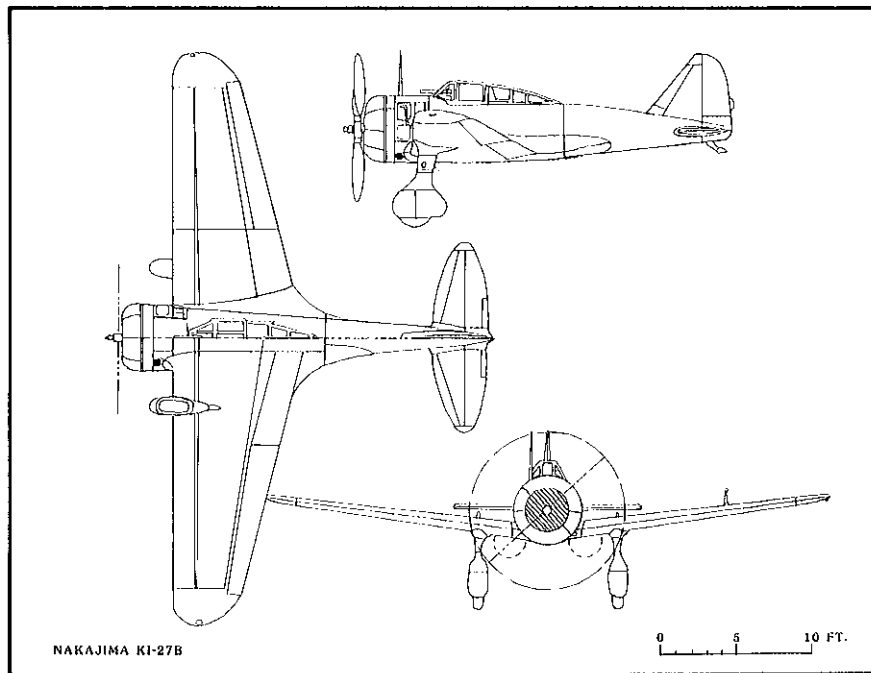


Fig. 10.12. The Nakajima Ki-27 Army fighter was used extensively in the war in China in the late 1930s. (Courtesy of Naval Institute Press)

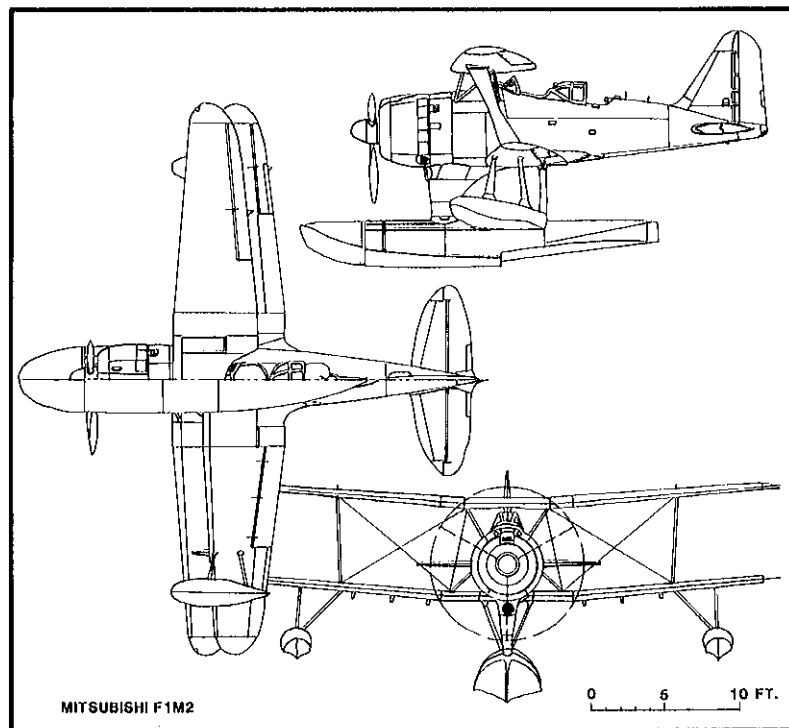


Fig. 10.13. The Mitsubishi F1M2 was unique because it was the only type of naval aircraft in the observation class to go into mass production. (Courtesy of Naval Institute Press)

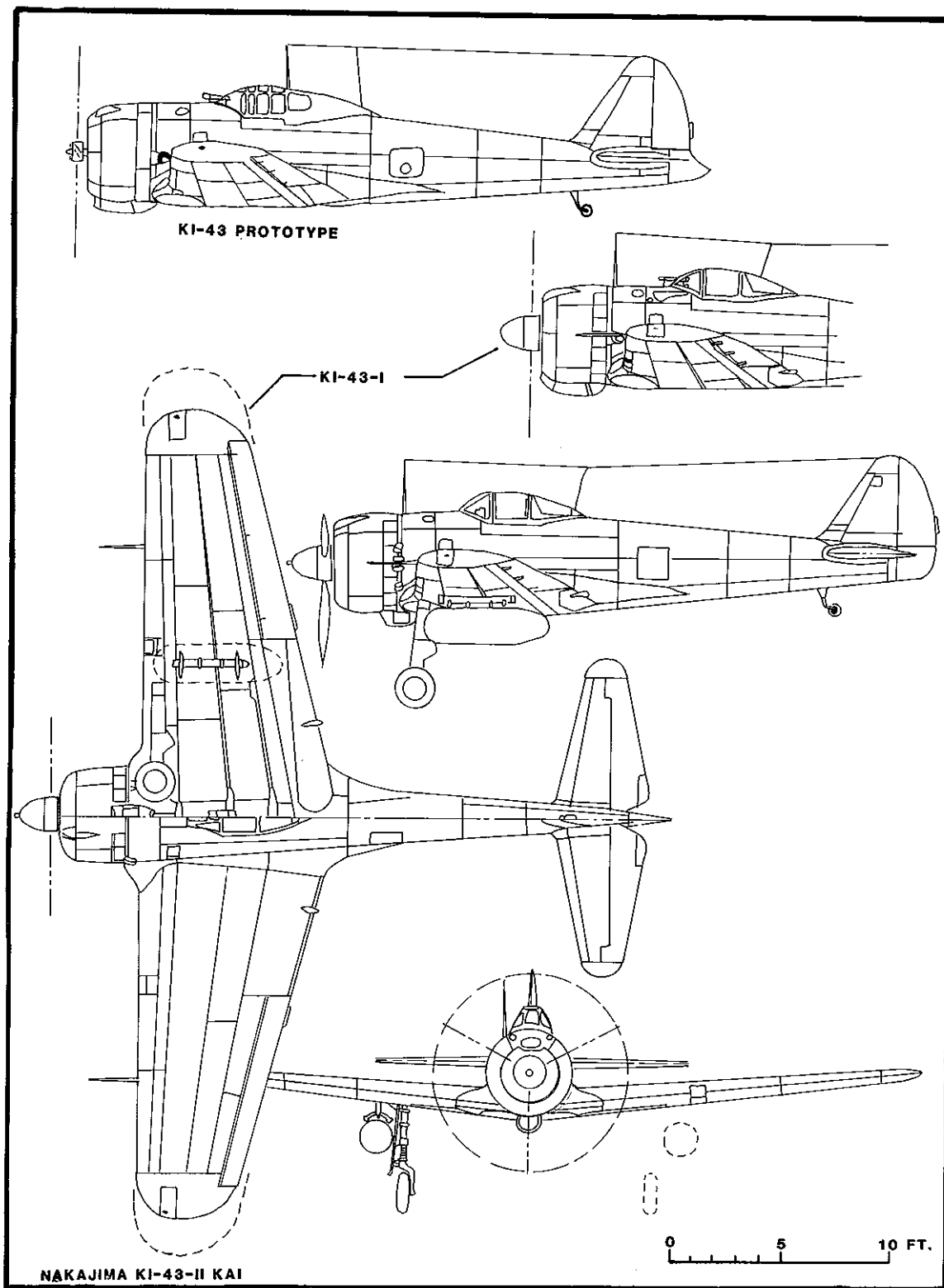


Fig. 10.14. Code-named Oscar, the Army Nakajima Ki-43 Hayabusa, known to the Japanese as Peregrine Falcon, was among the first Japanese aircraft to have a retractable undercarriage. (Courtesy of Naval Institute Press)

CHAPTER XI.
OTHER SUBMERGED CULTURAL RESOURCES
AND
UNDERWATER COMPONENTS OF LAND-BASED SITES:
THE ARCHEOLOGICAL RECORD

By Toni L. Carrell, Kevin Foster,
Daniel J. Lenihan, David T. Lotz and James E. Miculka¹

Introduction

This chapter is devoted to a discussion of nonshipwreck sites including smaller watercraft. More specifically, these are sites that range from the remains of pre-European contact fishing and quarrying to World War II equipment and materiel either lost or abandoned during the heat of battle. Because nearly every human endeavor in Micronesia involves interaction with water, an investigation and discussion of shipwrecks alone would present an incomplete picture of the full range of the submerged resources potential to be found in the islands.

An effort was made to examine as many different site types as possible and to include an overview of those resources in this chapter. The sites presented here are neither comprehensive nor exhaustive but are representative.

The objective of field work was to gather as much descriptive data as possible, given the constraints imposed by equipment, time and personnel resources. All research was completed using a nondestructive methodology emphasizing mapping of exposed wreckage, photography, artistic depictions, videotape and written description. Logistics also influenced the research approach. Because of the remoteness of the sites, the research emphasized short, intense, field investigations that leaned heavily upon volunteer divers and park professionals resident in the islands. As a result, this chapter contains written contributions from a variety of

¹With contributions from Dennis Blackenbaker, William Cooper, Rose S.N. Manibusan, Mark Michael, Lynne Michael and Edward Wood.

authors. It is organized into categories of island chain, island and site types, grouped together for discussion and analysis.

Mariana Islands

Investigations were undertaken on the islands of Saipan, Rota and Guam. Sites both within and outside American Memorial Park, Saipan, and War in the Pacific National Historical Park, Guam, were visited.

Saipan

American Memorial Park and Saipan Lagoon²

There have been four assessment surveys carried out by the War in the Pacific National Historical Park (WAPA) submerged research team. See Chapter 9 for a discussion of these projects.

Site-Specific Investigations

As a result of the four surveys, more than 50 sites were identified within the scope of this study. The majority of these were represented by post-World War II wreckage from U.S. pontoons or barges. Many of the remains were in poor condition and were not considered to be significant resources. With the development of the Smiling Cove Harbor in American Memorial Park, many of these wreckage fields were removed. These sites were identified and described in the American Memorial Park Submerged Cultural Assessment (Miculka and Manibusan 1983).

A total of 10n sites associated with either the interwar years or World War II are discussed here. The first three are located within the boundary of American Memorial Park; the remainder are within Saipan Lagoon. None of the sites have official site designation numbers, and they are simply referred to by their investigation number from either the 1983 (Figure 11.1) or the 1984 survey (Figure 11.2).

²This section on resources within American Memorial Park and Saipan Lagoon was written by James E. Miculka with contributions from Edward Wood, William Cooper and Dennis Blackenbaker.

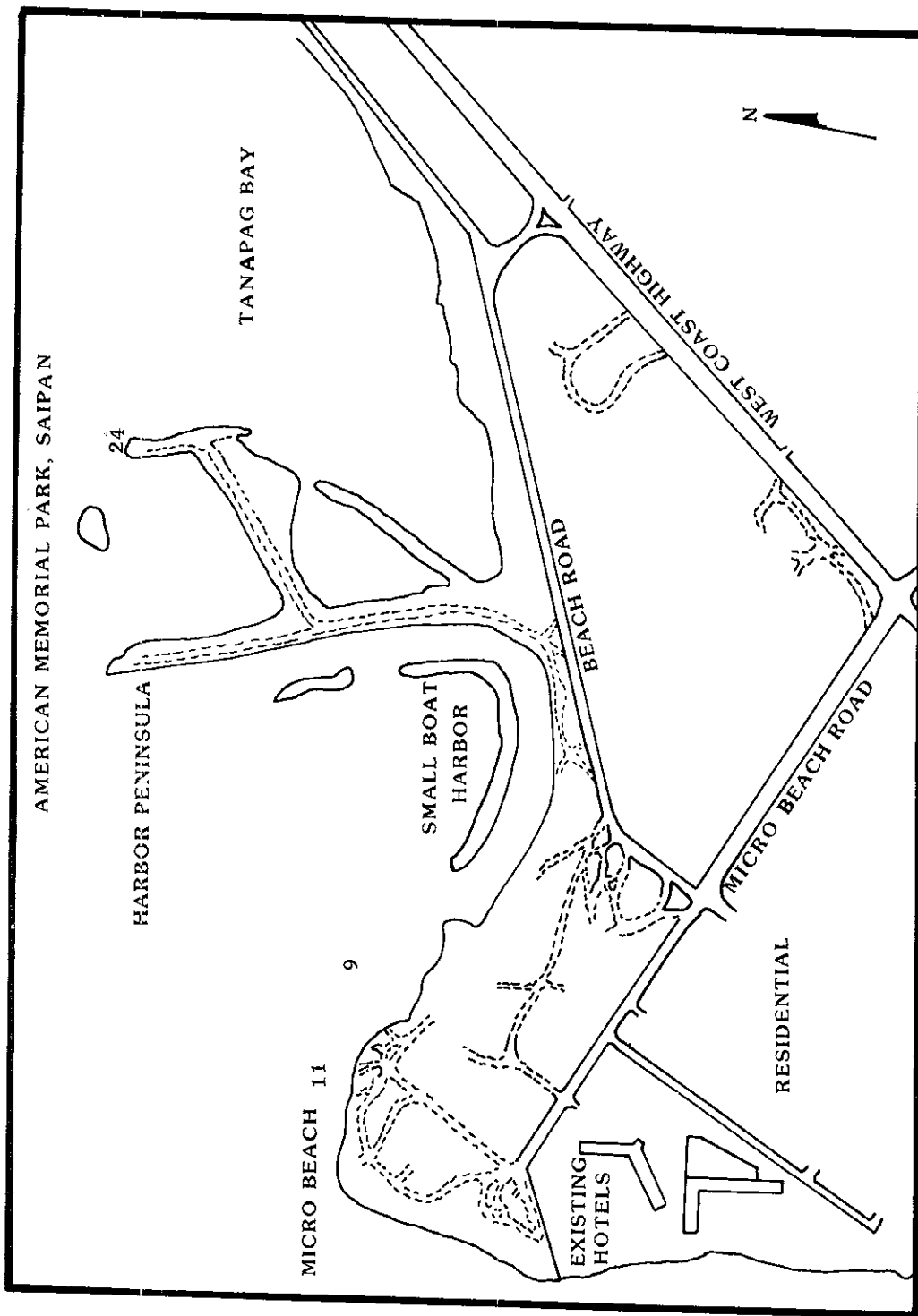


Fig. 11.1. Base map of sites investigated during submerged cultural resources survey of American Memorial Park, October 1983 and 1989.

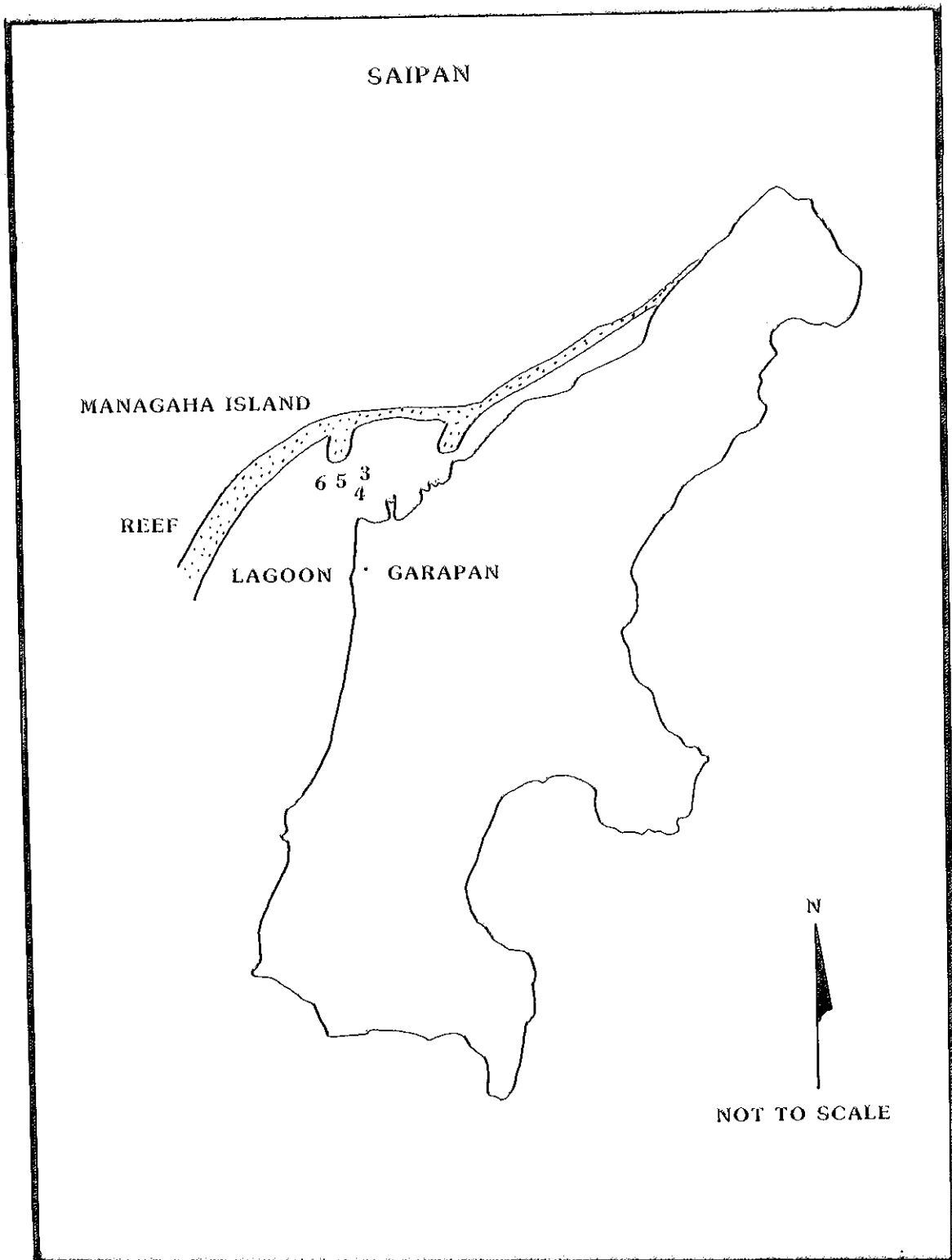


Fig. 11.2. Base map of sites investigated during submerged cultural resources survey of Saipan Lagoon, 1984 and 1989.

Site Number 9: Japanese Harbor Dredge

Located off Micro Beach (refer to Figure 11.1), this Japanese dredge is in fair condition with a length of 87 feet and width of 17.4 feet. The bow is 7.4 feet high. A large portion of this ship is out of the water. The wreck sits in about 3.3 feet of water.

Site Number 11: Japanese Antiaircraft Gun

During the 1983 survey, a Japanese antiaircraft gun was discovered (refer to Figure 11.1). Located in the same general area as the dredge, it appeared to be a Model 96 (1936) type 2, 25-mm AA/AT cannon, dual mount. It had a maximum rate of fire of 300 rounds per minute with a vertical range of 14,000 feet. The gun was in 5 feet of water and was in fair condition in 1983. It is possible that it may have been removed during the intervening years because it could not be relocated during the 1990 survey.

Site Number 24: Japanese Railroad Cars

A total of 14 Japanese sugar cane railroad cars were discovered in 1983 (refer to Figure 11.1). They are partially submerged off a peninsula within the boundary of American Memorial Park. The narrow-gauge railroad was constructed by the South Seas Development Company to transport sugar cane between three large plantations and two sugar mills. The molasses manufactured from some sugar cane was used to make alcohol and liquor, which were then converted into synthetic Scotch whisky, port wine, and other beverages for Japanese consumption. In 1930 Saipan's chief exports were sugar and alcohol. The narrow-gauge railroad was used by U.S. troops after the American invasion in July 1944. Its steam locomotive was repaired to transport gasoline and bombs to Aslito Airfield.

This site is definitely associated with the pre-American invasion of Saipan; the railroad was not rebuilt after the war. Most of the cars are in fair shape, rusted and covered with some coral growth. Several of the cars are partially exposed above the surface of the water. Two sections of narrow-gauge track were discovered in the same vicinity. The majority of these railroad cars are sitting right side up and were possibly dumped at the site by the Japanese as part of the fill material when the peninsula was constructed before the war.

Sample measurements of one railroad car are a length of 6.5 feet and a width of 3.3 feet. The wheel base is 3.3 feet high.

The following seven sites were first surveyed in 1984 and again in 1990. At present, they do not have site designation numbers and are referred to here by their number that resulted from the 1984 survey (refer to Figure 11.2). Each lies within Saipan Lagoon.

Site Number 3: Japanese Landing Barges

This site contains two landing craft in 30 feet of water (refer to Figure 11.2). It was thought to be an American LCVP (landing craft, vehicle, personnel). Similar to Site Number 6 in Saipan Lagoon, it is now felt to be a Japanese Army Daihatsu landing barge. Both craft are in fair shape and are about 150 feet from each other. The length of the vehicles is 57 feet and the width is 13 feet. There are two props located at the stern.

Site Number 6: Japanese Landing Barge

This site (refer to Figure 11.2) was originally thought to be the skeletal remains of an American LCVP (landing craft, vehicle, personnel), known as a "Higgins Boat." Further research by Sean Cahill, Park Ranger, WAPA, has led us to believe that it may be a Japanese Army Daihatsu landing barge (Figures 11.3 and 11.4). The length, width, bow configuration and winch arrangement all support this identification (Figures 11.5 and 11.6). If this is a Daihatsu landing barge, it is a very unique site.

Site Number 4: Japanese "Emily" Flying Boat

Located outside the boundary of the park, this site in 35 feet of water has been identified by William Cooper and Dennis Blankenbacker as a Japanese H8K3 "Emily" flying boat (Figure 11.7). This four-engine bomber is scattered over an area of 150 feet. The wing section remains intact. The fuselage is destroyed (Figure 11.8). The tail is about 14 feet from the wing section (Figure 11.9). Engines two and three have separated from the wing section and lie behind the wing section (Figure 11.10). The wing length is approximately 125 feet. The wreck is in fair condition.

Site Number 5: Japanese "Jake" Float Plane

This is a small, single-engine, float plane located in 35 feet of water (refer to Figure 11.2). This plane has been identified by Cooper and Blankenbacker as a Japanese Aichi E13A1 (type 0) float plane, code-named "Jake" (Figure 11.11). This plane is almost intact, with one of the floats off to the side. It is lying upside-down, with the camera sight hole, bomb racks and external fuel racks all visible (Figure 11.12). Also, somewhat recent additions are a bottle



Fig. 11.3. Japanese Daihatsu landing barge sunk in Saipan Lagoon. (Photo by Tim Rock)

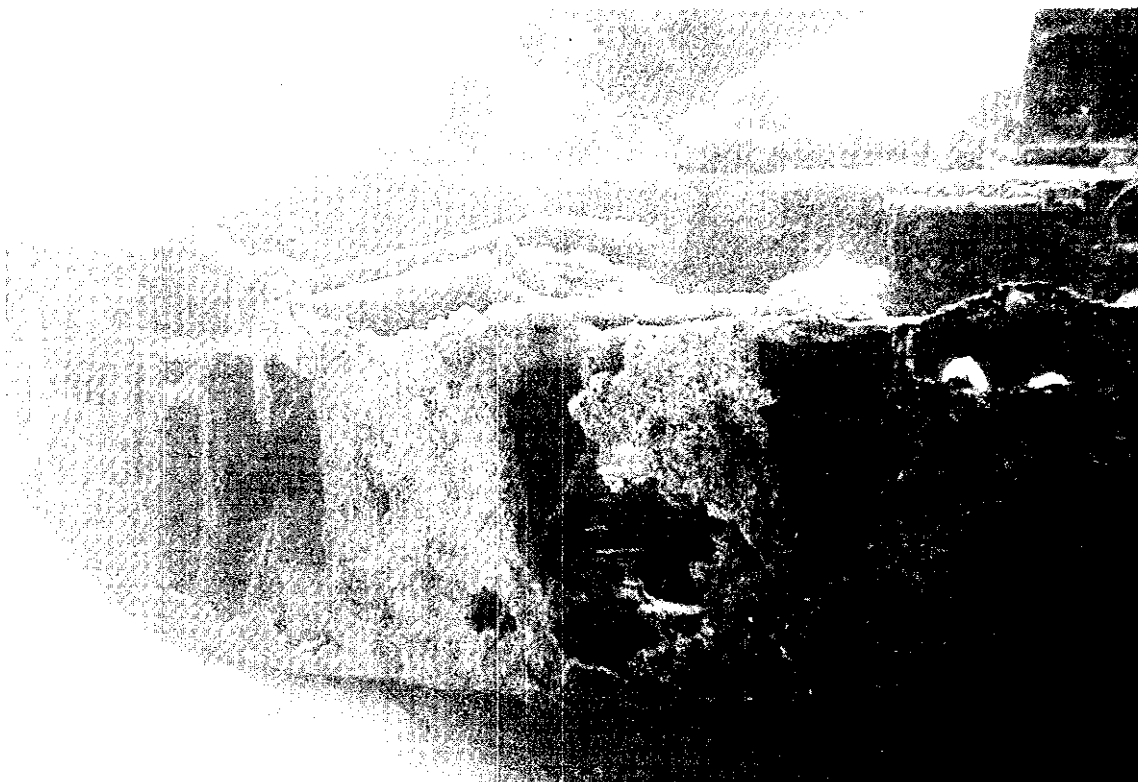


Fig. 11.4. Port and stern quarter of Daihatsu landing barge. (Photo by William Cooper)

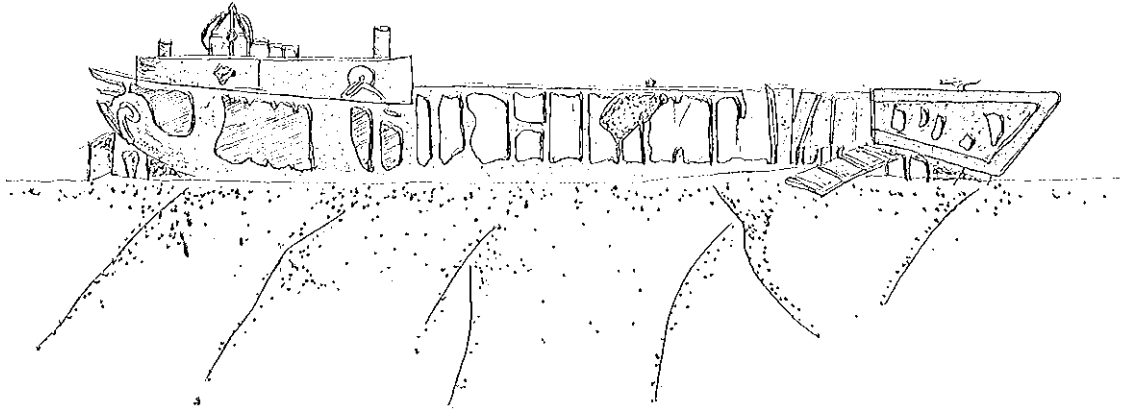


Fig. 11.5. Profile view of Japanese Daihatsu landing barge, site 6, Saipan Lagoon. (Sketch by William Cooper)

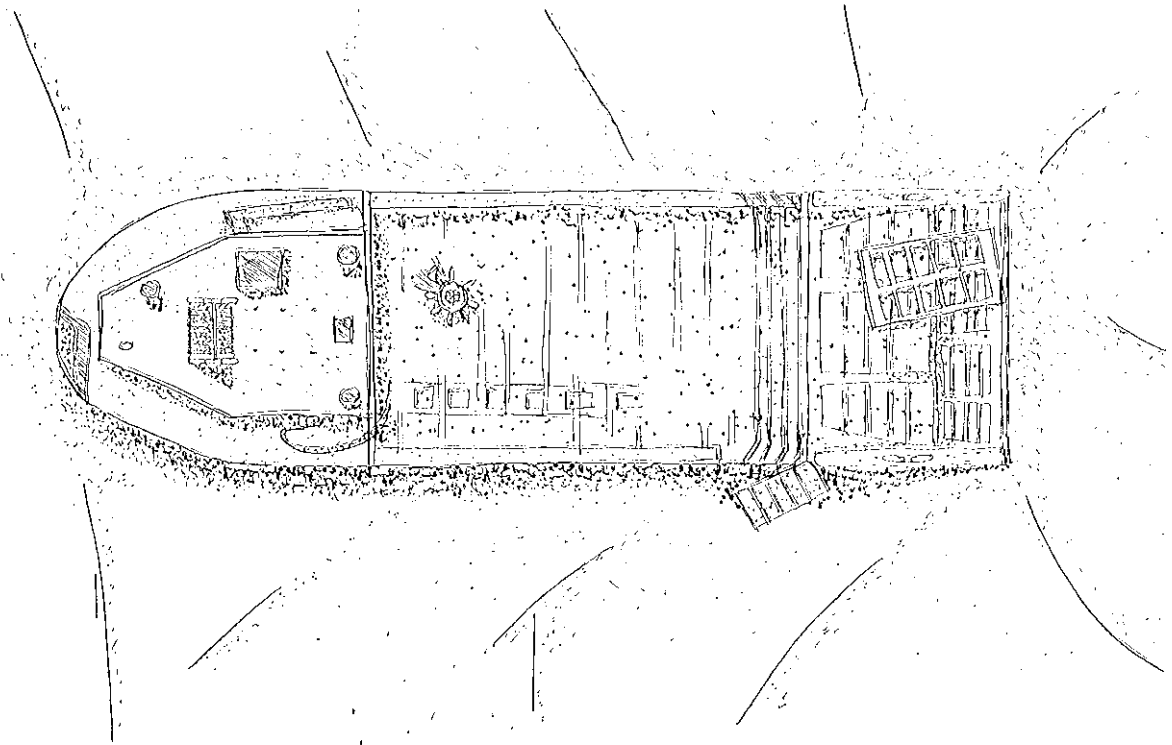


Fig. 11.6. Plan view of Japanese Daihatsu landing barge sunk in Saipan Lagoon. (Sketch by William Cooper)

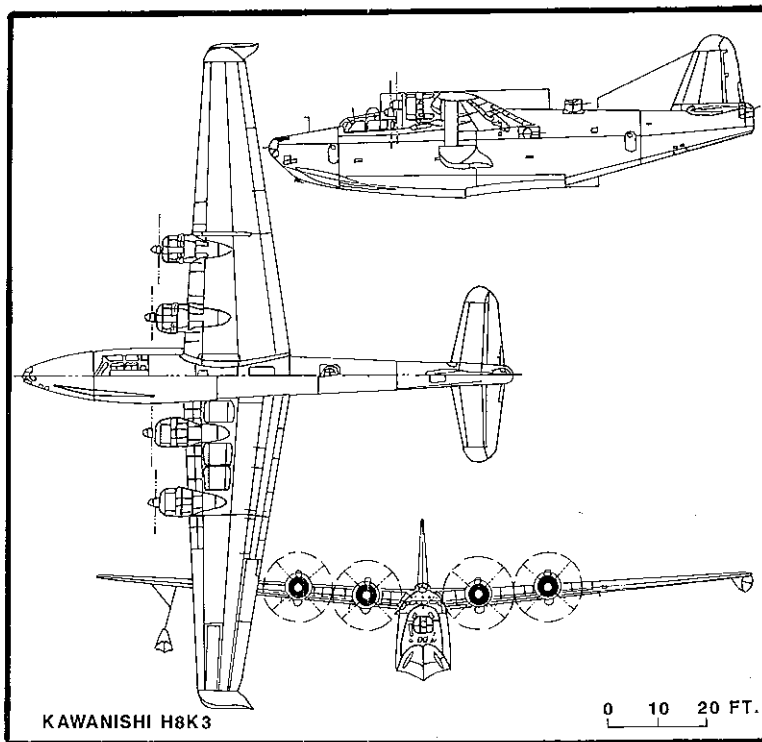


Fig. 11.7. Code-named "Emily," this four-engined, long-range bomber and reconnaissance flying boat carried a crew of 10. (Courtesy of Naval Institute Press)



Fig. 11.8. Disarticulated engine from Japanese flying boat lost in Saipan Lagoon. (Photo by William Cooper)

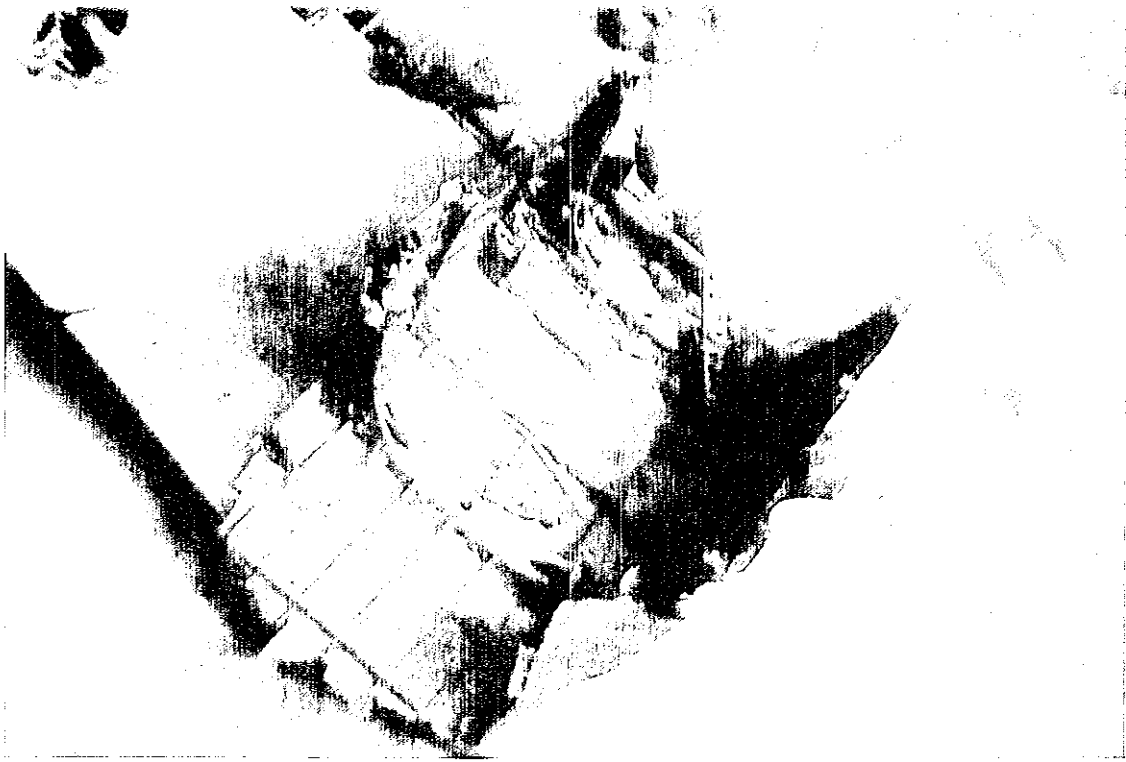


Fig. 11.9. Tail section of "Emily" flying boat. Note the breadth of the tail to permit gunner access to the tail cannon. (Photo by William Cooper)



Fig. 11.10. Emily nose and fuselage debris forward of the wing. (Photo by William Cooper)

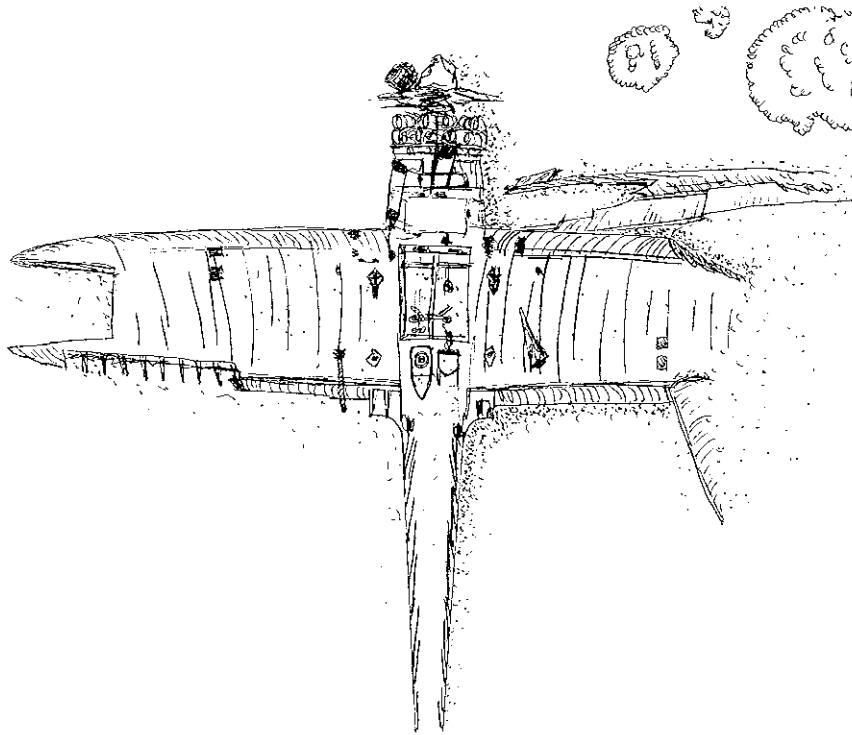


Fig. 11.11. The Japanese Aichi float plane was code-named "Jake." (Sketch by William Cooper)

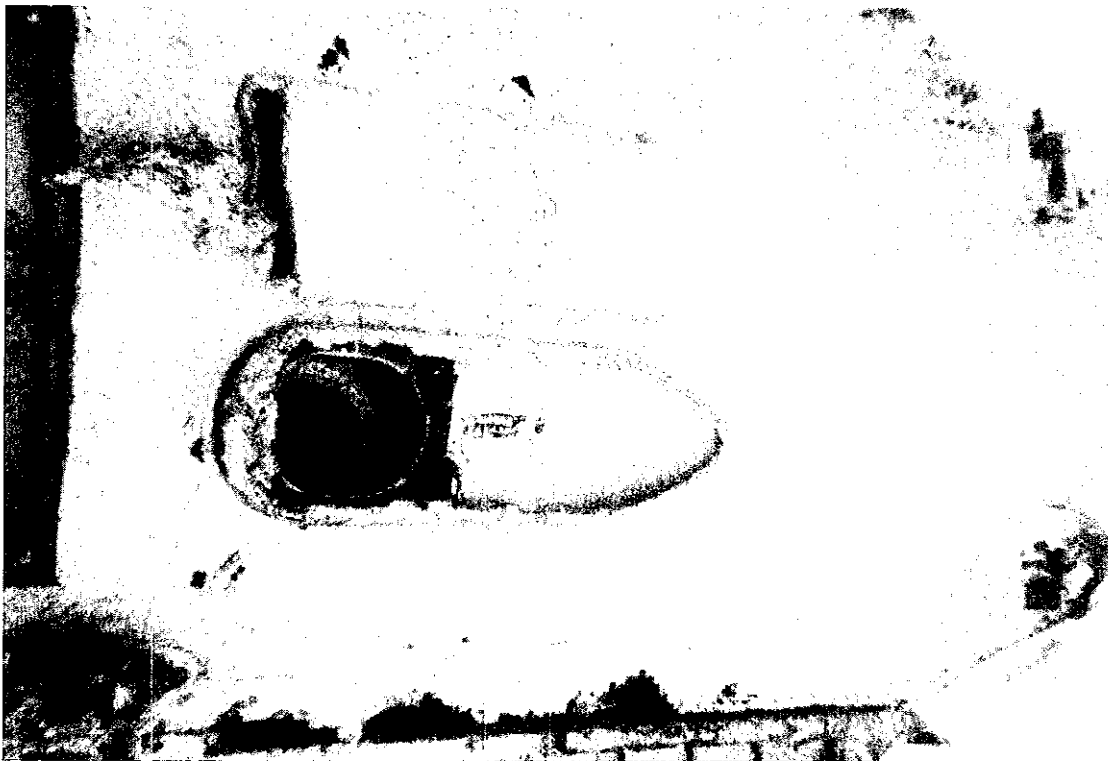


Fig. 11.12. The camera sight hole, bomb racks and external fuel racks are visible on the remains of this Jake float plane lost in Saipan Lagoon. (Photo by William Cooper)

of sake and a Japanese prayer stick chained to the propeller (Figure 11.13). These may have been placed there during a Japanese memorial ceremony.

Unnumbered Site: Unidentified Japanese Plane

This site, first surveyed in 1990, has not yet been identified. Because no attach points between the fuselage and wing were visible, it was originally thought to be Japanese type 99 2EFB "Cherry." The missing attachments at first suggested that the plane had a high-wing, suspended fuselage with two engines, much like the Cherry.

After further research, there are indications that this identification was incorrect. The dihedral, that is, the angle of the wings in relationship to the fuselage, and the square engine nacelle with the presence of landing gear well in the nacelle, indicates that it may be some other type of aircraft. Not much is left of the site, but the wreckage is scattered over 50 feet. A portion of the upside-down wing is the major identifiable piece of the wreckage (Figures 11.14 and 11.15).

Unnumbered Site: American TBM Avenger

This site is a single engine aircraft located in 7 feet of water about 1-1/2 miles south of Managaha Island and about 150 feet inside the reef. It is lying upside-down and is broken off behind the cockpit. Only the wing and engine mount are left. The landing gear was extended and is of a type that retracts outward towards the wing tip. Also, what appears to be a radio box is about 20 feet behind the wreckage. According to Cooper, tentative identification is that of an American TBM Avenger because of its wing size width, fuselage and landing gear configuration.

During the 1990 survey, William Cooper made an observation regarding the positions of the aircraft that may explain an observed phenomenon: all of the aircraft surveyed were upside-down. This could be due to several factors such as an unplanned ditching with the pilot unconscious or not in the aircraft. The deceleration combined with the weight of the engine could cause it to come to rest inverted. In the case of the TBM, the gear being extended would also be a factor. Of course, one other explanation is time and weather. The lagoon is shallow, and storm surge could have inverted the craft and scattered debris.

Unnumbered Site: American Landing Vehicle, Tracked

This site contains the scattered remains of about 11 American LVTs (landing vehicle, tracked). All of them are in poor



Fig. 11.13. Engine and prop from the Jake lost in Saipan Lagoon. The bottle of sake and prayer stick tied to the



Fig. 11.14. One distinguishing characteristic of this unidentified plane is the angle of the wings in relationship to the fuselage. (Photo by William Cooper)



Fig. 11.15. The square engine nacelle on an unidentified plane lost in Saipan Lagoon. (Photo by William Cooper)

condition and are outside the reef, north of Saipan Lagoon. Storm surge has probably damaged them. It appears that these vehicles were dumped on this site and not sunk as a result of battle action. These vehicles are in about 100 feet of water. A measurement on a sample vehicle shows a length of 26 feet and width of 10 feet. At the north end of the site, a stone cross approximately three feet in length is located.

Administrative Status

The American Memorial Park is administered by the U.S. National Park Service; however, the Commonwealth of Northern Mariana Islands (CNMI) can request the return of the park at any time. The area of Saipan Lagoon is administered by the commonwealth.

Present Threats and Impacts

The developing tourism operations of the CNMI could cause heavy visitation to these sites by scuba divers. There is already a commercial tour submarine on Saipan that offers tours of some underwater sites. There have been reports of this tour submarine damaging some of the sites.

Rota

National Park Service Submerged Cultural Resources Unit archeologist, Toni Carrell, and diving technician, Ken Vrana, visited the island in 1987 at the suggestion of Mark Michael, owner of Dive Rota. Michael, representing Rota at a submerged cultural resources training workshop held on Guam, requested assistance in identifying submerged cultural resources located in Sasanhaya Bay. Since the NPS visit, Michael has continued to document the remains of submerged sites around the island.

Phosphate Mine Dock and Cable Run³

During the years between World War I and World War II, phosphate was discovered on Rota. The Japanese quickly moved to exploit this important resource and established a mine and cable car run on the savanna (Figure 11.16). The cable cars ran from the mine down the cliff face to a processing factory facing Sasanhaya Bay (Figure 11.17). The factory was built on a narrow shelf above the bay (Figure 11.18). From there

³Information in this section was written by Toni Carrell based on information provided by Mark and Lynne Michael.

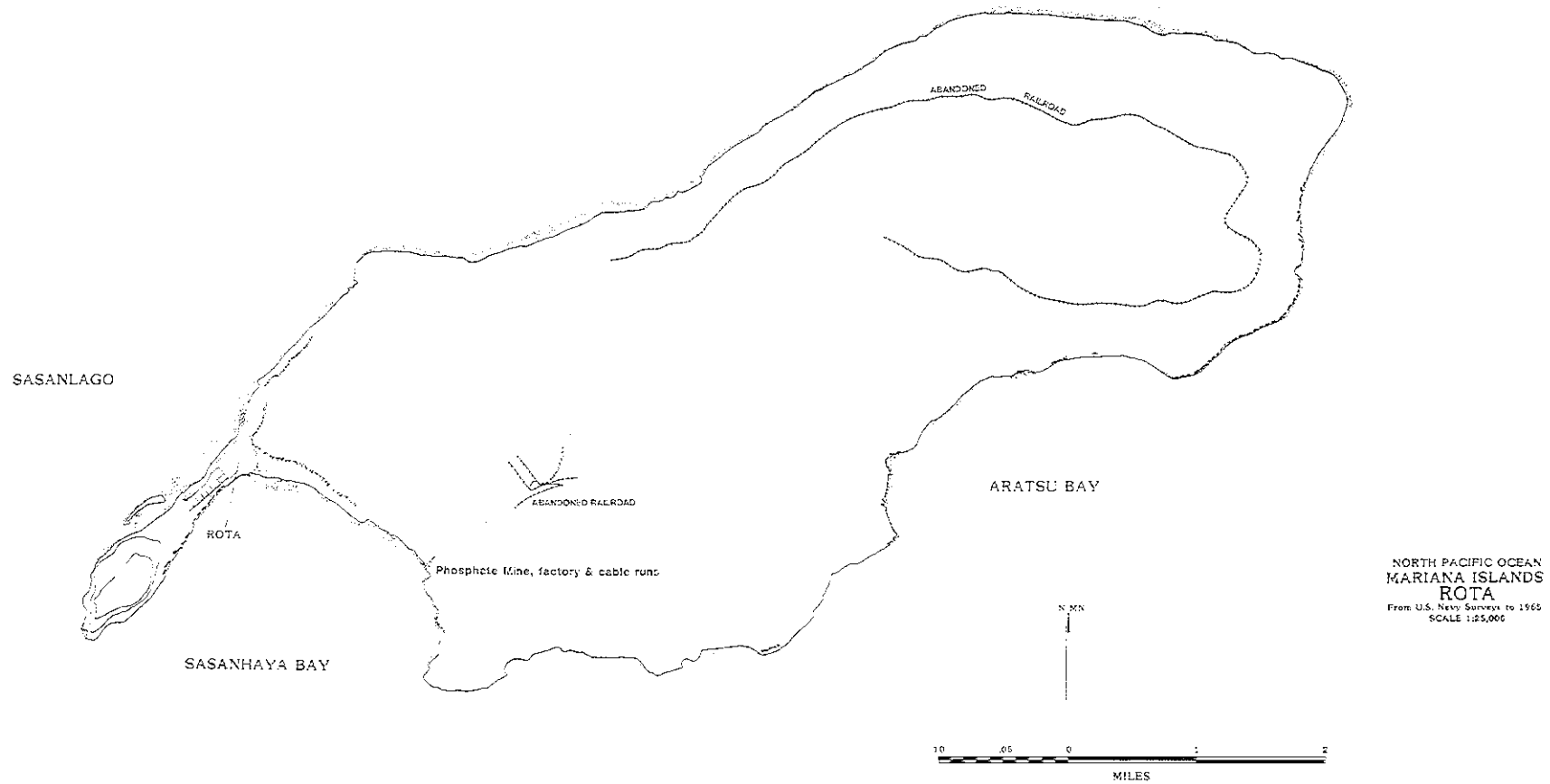


Fig. 11.16. Location of Japanese phosphate mine and ruins of factory and cable car run on Rota.

Fig. 11.18. The phosphate factory on Rota was built on a small shelf above the bay. The concrete base of the jump ramp/loading dock is still intact today. (Photo courtesy of Mark Michael)

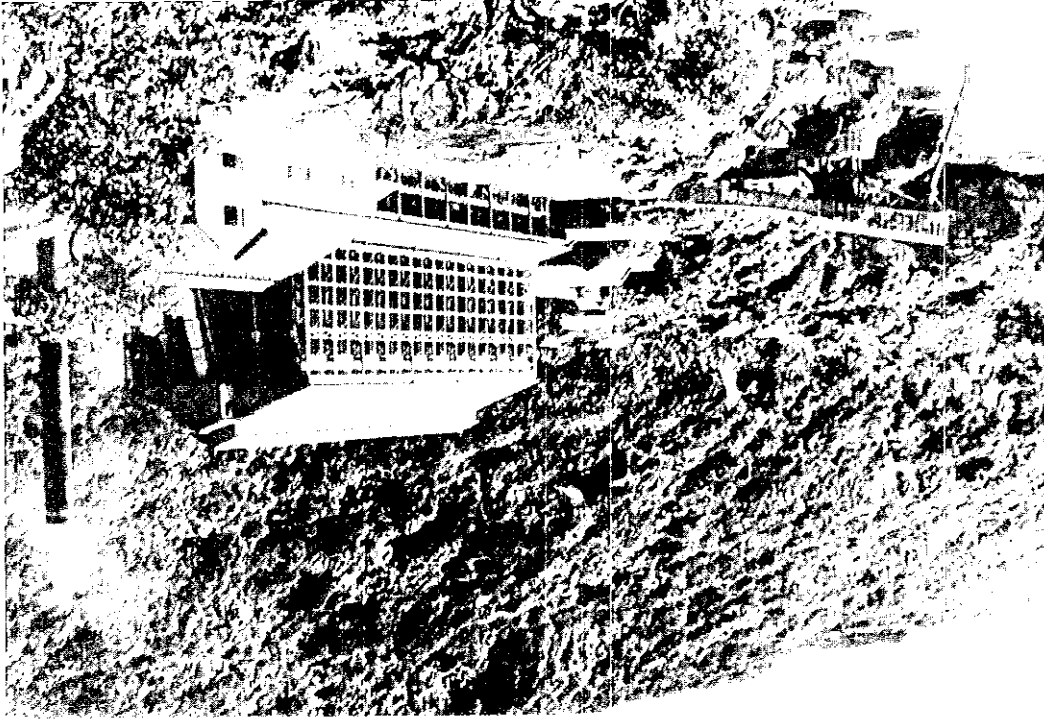
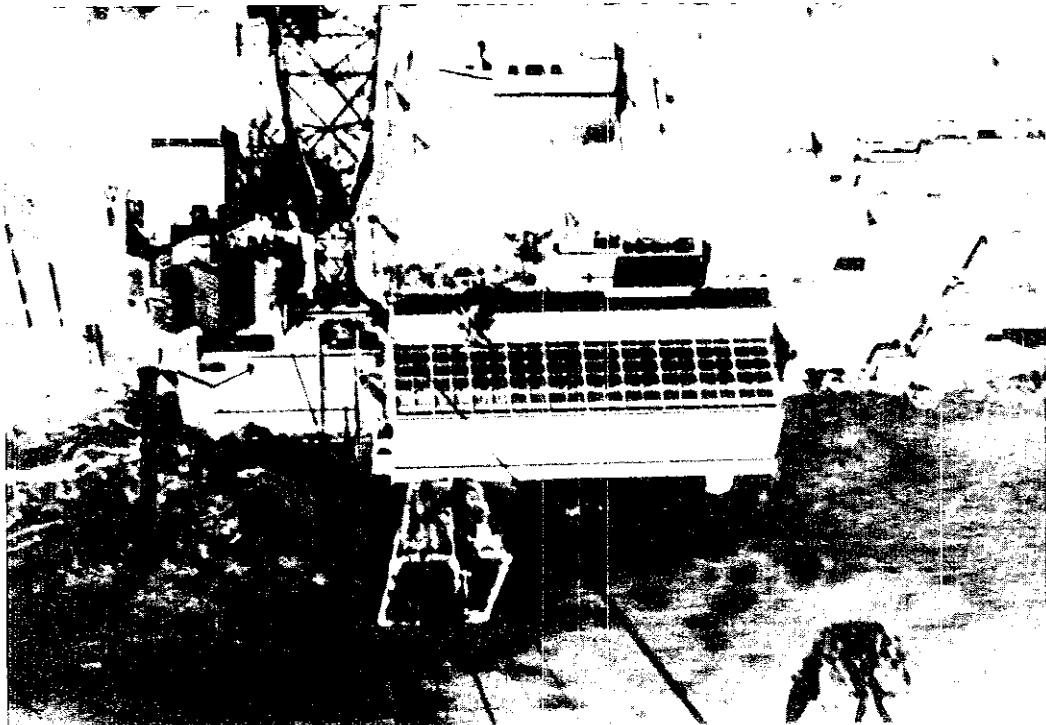


Fig. 11.17. Cable cars ran from the mine on the top of island down to the factory above Sasanhaya Bay. (Photo courtesy of Mark Michael)



the ore was transferred, again via cable cars, through a jump ramp above a small dock to barges and then to waiting cargo ships offshore (Figure 11.19).

Ruins of the mining operation on the savanna are overgrown. However, the remains of the cable car towers on the cliff face are visible. Thick growth obscures the remains of the factory, and only the foundations of the towers and loading dock, extending offshore in shallow water, are apparent (Figure 11.20).

The cement foundations are in less than 20 feet of water on a white sand bottom. Cables from the towers, anchor chain and an anchor are also present. The site, locally referred to as Cable Run, is a popular dive destination because of the presence of large coral heads and sand flats.

Administrative Status

All of the sites in and around Rota are administered by the local government and are under the umbrella of the historic preservation law of the Commonwealth of the Northern Mariana Islands.

Present Threats and Impacts

Sport diving is a popular activity on Rota. At present there is little effective control over the removal of artifacts from sites. The local dive shop owners, Mark and Lynne Michael, do not encourage divers to remove artifacts and have made strong efforts to record the location and photograph artifacts from submerged sites around the island.

Guam

War in the Pacific National Historical Park⁴

In February 1981, the Submerged Cultural Resources Unit (SCRU) from Santa Fe, New Mexico, visited the park for the first time. They made a preliminary assessment and suggested further underwater archeological survey needs. The team returned in September 1983 for a more extensive reconnaissance survey. This was the first survey of the two water units of the park. Although most of the survey took

⁴This section on resources within War in the Pacific National Park and nearby sites was written by James E. Miculka and Rose S.N. Manibusan.

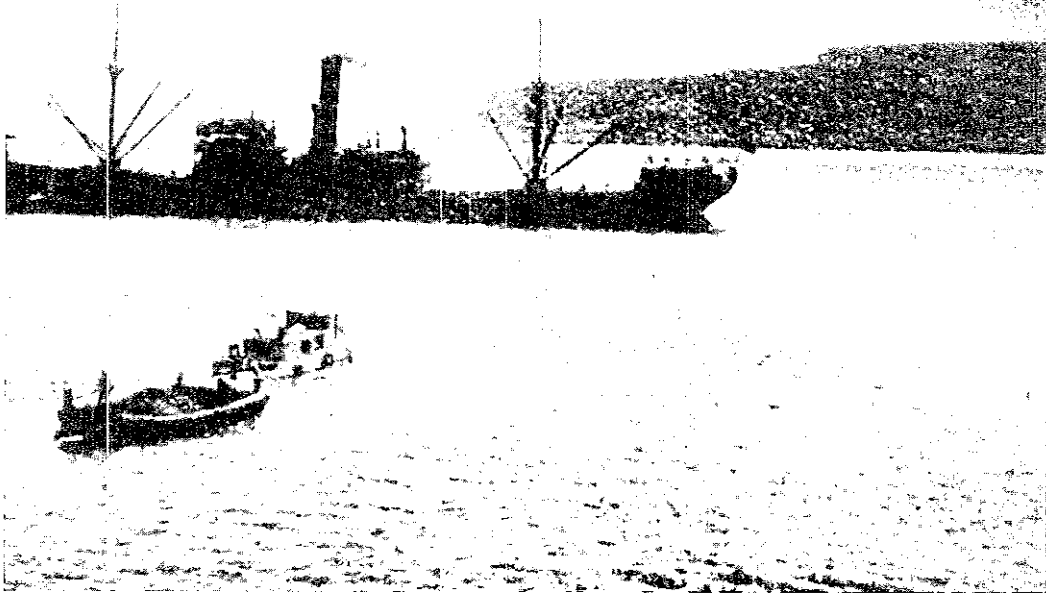


Fig. 11.19. The phosphate ore was transferred to barges by a jump ramp, then towed out to waiting cargo ships. (Photo courtesy of Mark Michael)



Fig. 11.20. The foundations of a cable tower adjacent to the loading dock are still visible. (Photo by Mark Michael)

place in Apra Harbor, SCRU and the park's dive team managed to look at selected sites within the Asan and Agat units. A report and underwater video footage are on file from this survey.

The park's Submerged Resources Team (SRT) underwent training on submerged cultural resource management techniques in April 1985. This was conducted by SCRU and involved further field surveys of the offshore areas of the Agat Unit. A 6-week survey in conjunction with SCRU and the U.S. Navy took place in May-June 1987. During the summer of 1988, SCRU and the War in the Pacific National Historical Park SRT began mapping the SMS CORMORAN and TOKAI MARU sites.

The underwater surveys within the park are conducted as time permits. With the limited staff (currently two) on the park's dive team and a couple of volunteers, survey activities are progressing slowly but steadily. It should be mentioned that the submerged cultural resources management operations in the park could not take place without the assistance of volunteers such as Bill Cooper, Tim Rock and Suzanne Hendricks.

Six known sites related to the Pacific Theatre of World War II are located within the two offshore areas of the park. These sites were discovered during partial transects of each unit with maximum depths of 60 feet. The information presented here was gathered during the 1983 and 1987 surveys and training dives by the park's SRT.

Site-Specific Investigations

Two known sites related to World War II are within the Asan Beach Unit (Figure 11.21). The entire Asan Beach Unit needs to be surveyed in detail and mapped under archeological conditions. It is possible that additional World War II equipment may be found in deeper water. The site numbers used in the following discussion are arbitrarily assigned and referenced on Figure 11.21.

Site Number 1: Amphibious Tractor Treads

On a transect survey carried out in 1987, a site located in approximately 60 feet of water was discovered. It is approximately 500 yards offshore. The remains appear to be treads from amphibious tractors, which are tangled among the coral. There do not appear to be any vehicles in the area associated with the site. The site was examined only briefly at the time, and there has been no further investigation.

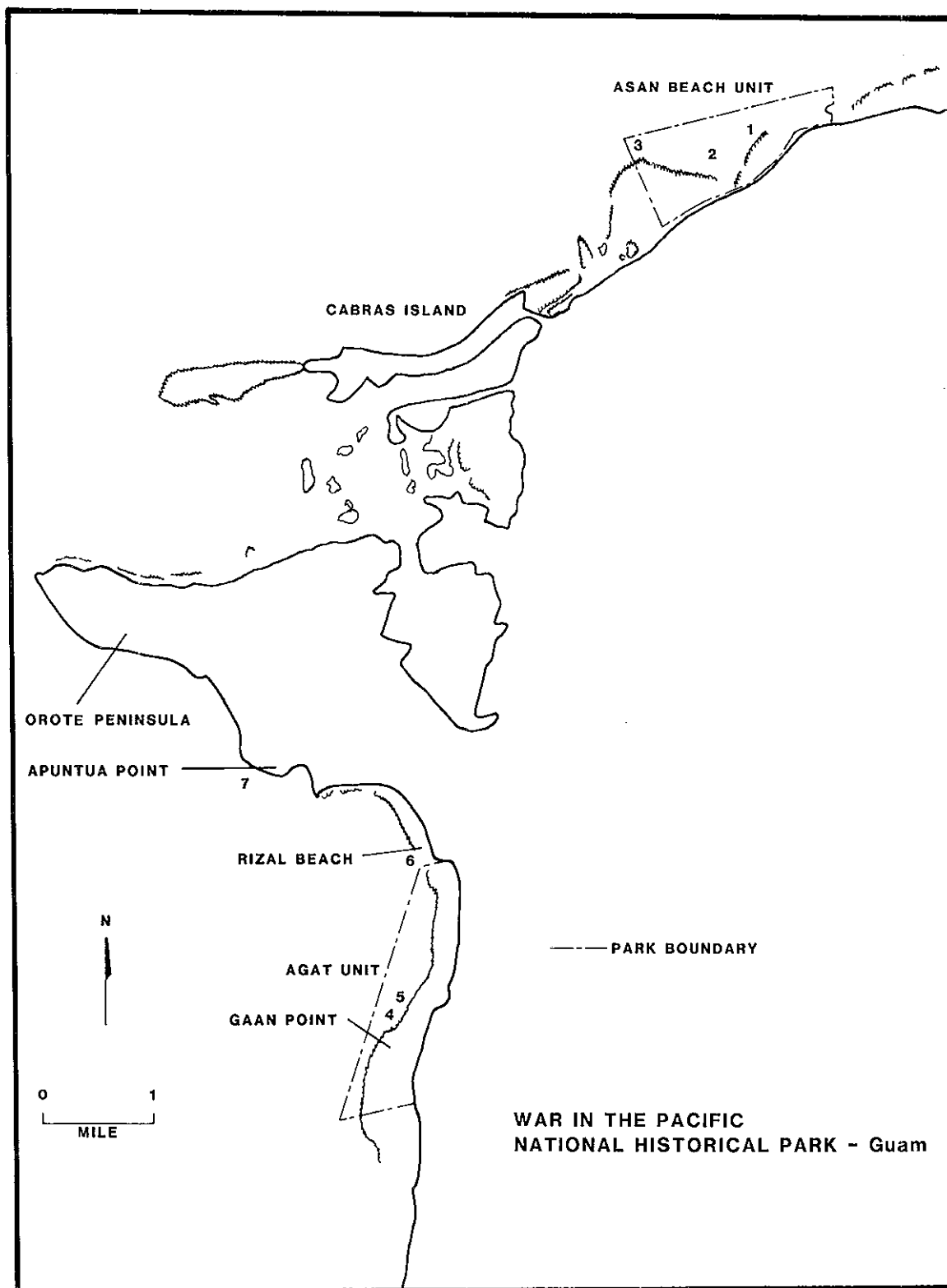


Fig. 11.21. Base map of submerged sites in War in the Pacific National Historical Park and adjacent areas.

Site Number 2: American LVT

A well-known site, located just off the area known as Asan Cut and approximately 200 yards from the park's visitor information center, is an amphibious tractor (refer to Figure 11.21). It is located in approximately 35 feet of water and is in generally poor condition; for the most part, it is just a frame. This LVT (landing vehicle tracked) or "amphtrac," is possibly that of a LVT-1.

The LVTs were produced by several manufacturers and generally shipped directly to staging areas or to the field. Average life for LVTs was estimated at 600 hours with an average track life of 150 hours. Once in the field, it was found that 2 hours of maintenance were required for each hour of use, although they rarely received the required maintenance.

The LVT-1, which was the first in a series of four models to be produced, carried a two-to-three-person crew. On land it had a speed of 12 miles per hour and a radius of 150 miles. While in the water, its speed was reduced to 6 miles per hour with a radius of 60 miles. It carried 80 gallons of fuel and had a six-cylinder Hercules engine. It measured 21 feet, 6 inches long, 9 feet, 10 inches wide and 8 feet, 1 inch high. The empty weight was 17,300 pounds and fully loaded it weighed 21,800 pounds.

Site Number 3: Camel Rock Ammunition Dump

In a report produced by the Explosive Ordnance Disposal Group One in 1978, the site is described as containing at least 64 tons of unexploded World War II Japanese and American ordnance. The ordnance ranges in size from .30-caliber bullets to 500-pound bombs. The general physical condition of the ordnance is poor, and the depths of the scatter range from 30 feet to at least 130 feet. The survey area included an area from the mouth of the Asan River to Camel Rock.

The ammunition dump at Camel Rock was the result of a postinvasion cleanup of ordnance. The Navy gathered the ordnance and sealed them in tar, loaded them on crates and then dumped the crates off Camel Rock (refer to Figure 11.21). No other information on the site exists except for the 1978 report.

Three known sites have been examined in the Agat Unit; each is related to World War II military activity. Like the Asan Beach Unit, the Agat Unit needs more detailed surveys, which could lead to the discovery of additional remains.

Adjacent to this site is a large outboard motor with an engine 3-feet, 6-inches wide, a shaft 10-feet, 7-inches long and a propeller 3-feet, 6-inches wide (Cooper 1991).

Site Number 4: Gaan Point Amtrac

The best-known site is that of an LVT located about 500 yards offshore of Gaan Point (refer to Figure 11.21). This LVT-4 is in good condition and in approximately 35 feet of water. During a 1985 training session, the site was mapped (Figure 11.22).

The LVT-4 differed from its earlier version located in Asan. The LVT-4 contained a 7-horsepower Continental engine and had a land speed of 20 miles per hour and the same radius as the LVT-1. In the water, it had a range of 75 miles and a speed of 7.5 miles per hour. Its fuel capacity was 140 gallons. It is 26 feet, 1 inch long, 10-feet, 8-inches wide and 8 feet, 1 inch high. Its empty weight is 27,400 pounds and fully loaded it weighed 36,400 pounds and carried a crew of two to seven people.

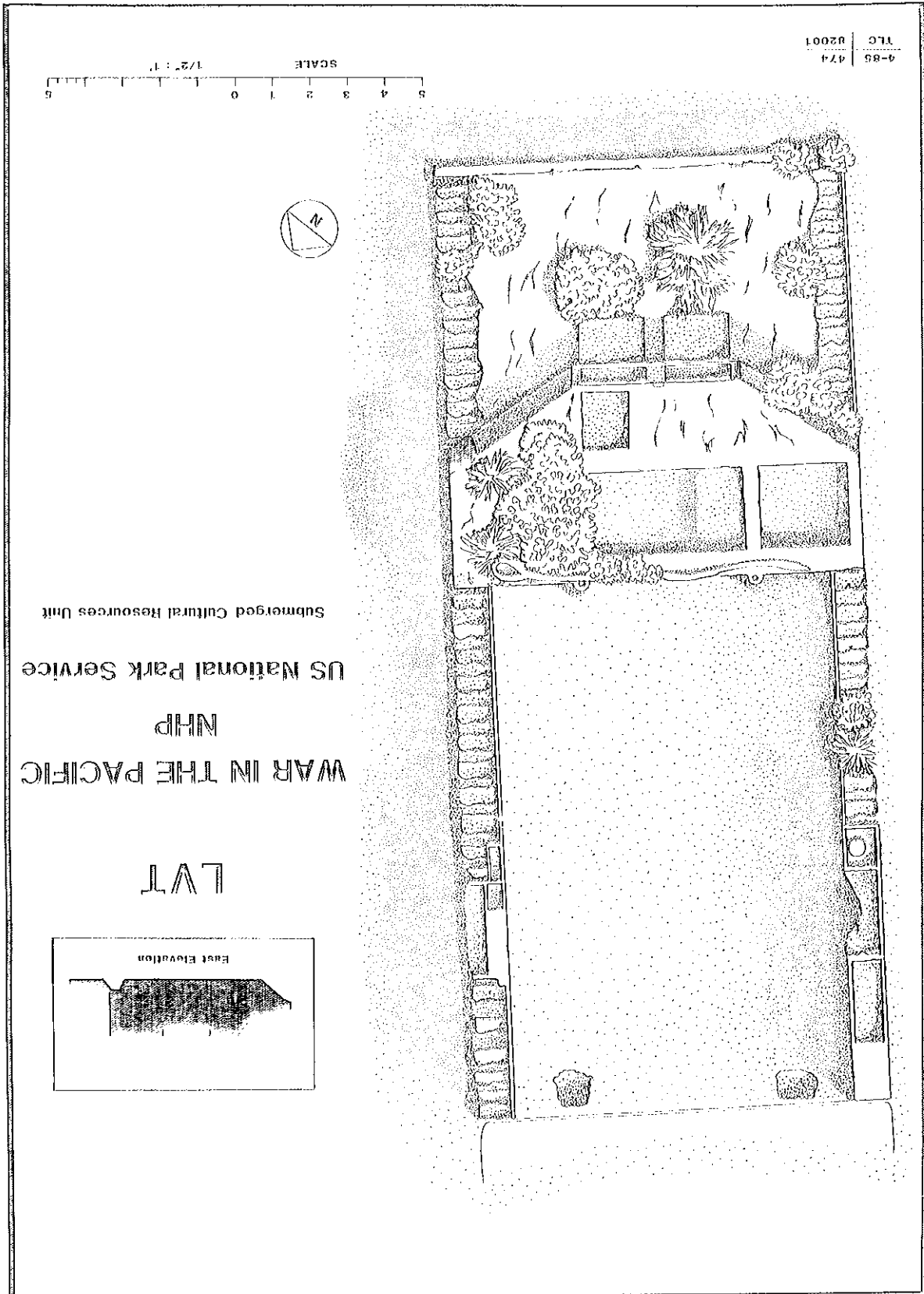
Very little is known about the LVTs. It is purely conjecture whether they were sunk during the invasion or later dumped as surplus equipment. No battle damage is evident on either tractor.

Site Number 5: American Pontoon Barge

Another site is located south of Gaan Point in a 70-foot crevice formed by finger reefs (refer to Figure 11.21). The site consists of portions of a barge with a hoist or crane assembly used for the transfer of fuel-oil drums or other supplies to amphibious vehicles. The site includes 12 55-gallon drums, a partially buried wheeled cart, a crane or hoist assembly with a block, batteries still in their battery boxes, large pieces of sheet metal for the barge, and a soldier's helmet. Support for this tentative identification comes from the following quote:

... all cargo [off Agat Beach] had to be restaged to amphibious vehicles several hundred yards offshore. ... the cranes at Agat were mounted on pontoon barges moored along the line where the shallow water began.... Another device employed to expedite unloading ... was the construction of improvised pontoons.... The rafts could then be floated over the reef and in to shore (US Army in World War II: The War in the Pacific Campaign by Philip A. Crowl, p. 358).

Fig. 11.22. American LVT located off Gaan Point. (Drawn by Pont Carrell)



First discovered in 1985 (Carrell 1985), the site has not been visited since; its current status is unknown.

None of the park surveys has concentrated on prehistoric sites; therefore, it is not known if any prehistoric sites exist within the park.

Administrative Status

The submerged sites lie within the authorized boundaries of the park. Titles to the offshore areas are currently held by the Government of Guam and the U.S. Navy.

Present Threats and Impacts

Because access to some of the sites generally requires the use of a boat, diver impact is not a primary concern at this time. The well-known sites have been picked clean of any artifacts. Other than informal patrols of the sites, not much is known about visitation to the sites.

The ammunition dump has been identified as a hazardous site. All dive shops are aware of the dangers, and divers are warned not to remove or disturb ordnance. Only informal and infrequent patrols are made of the site.

Rizal Beach

Site Number 6: Amphibious Tank Turret

Just north of Rizal Beach are the remains of an amphibious tank turret and a scattering of ammunition (refer to Figure 11.21). The main body of the tank was destroyed in a typhoon in 1982. The isolated turret lies in 40 feet of water (Figure 11.23).

Apuntua Point

Site Number 7: World War II Equipment Dump

Located just south of Orote Peninsula, this site is a post-World War II materiel dump site (refer to Figure 11.21). The bottom is littered with the remains of tracked vehicles, mess hall trays, cables, small wheeled carts, tires, telephone PBX equipment, and radio and ammunition boxes, among other items. Wreckage is scattered down a steep slope and begins in just over 10 feet of water and extends to at least 130 feet. The site has been locally referred to as Shark Hole (Figure 11.24) (Rock 1986:9) and is well-known and regularly visited.



Fig. 11.23. Park Ranger Jim Miculka videotaping tank turret off invasion beach at Guam. (NPS photo by Larry Murphy)

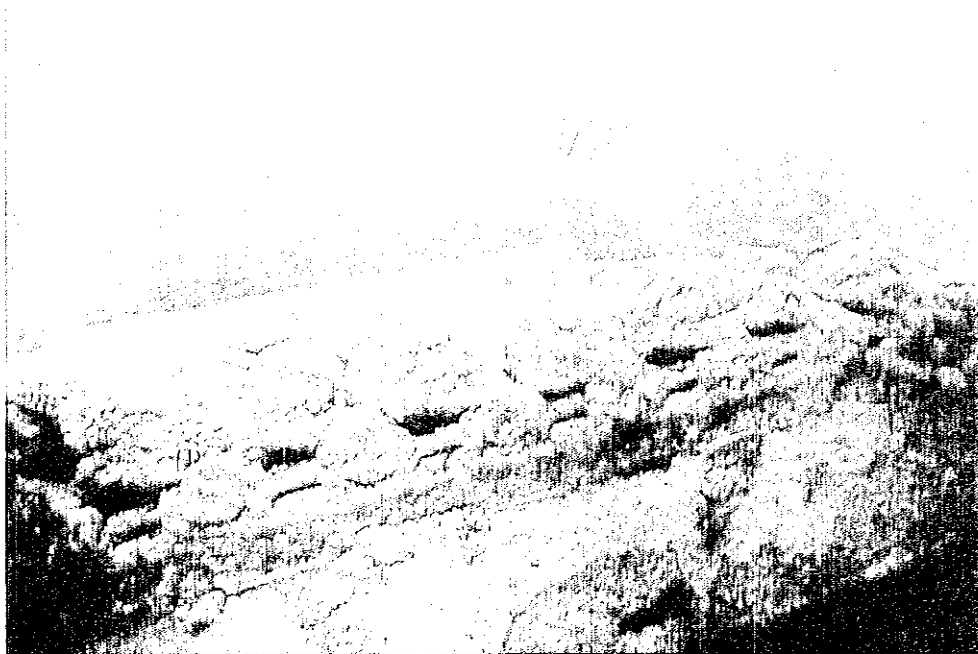


Fig. 11.24. Tracked vehicles part of war materiel dump site at Shark Hole, Guam. This photo taken at depth of 140 feet. Materiel extends to at least 200 feet. (NPS photo by Larry Murphy)

During the submerged cultural resources training course at War in the Pacific National Historical Park in 1985 (Carrell 1985), two artist's perspective drawings were made of the area (Figures 11.25 and 11.26) by volunteer diver James R. Roybal.

Aircraft Resources⁵

During World War II, numerous aircraft, both American and Japanese, were shot down in the air over Guam and the adjacent ocean. Comdr. David McCampbell, Sr., of the ESSEX noted on the afternoon of June 19, 1944, that 17 fires or oil slicks from downed aircraft were noted within a 1-mile radius of Apra Harbor. However, from these attacks only two Japanese aircraft are known to exist in shallow water accessible by scuba divers.

Japanese Navy Aichi D3A2 "Val"

Code-named "Val," this small dive bomber from the 652nd Naval Air Group, was shot down over Apra Harbor (refer to Figure 11.31). The two-seat carrier- or land-based dive bomber has a low wing monoplane configuration (Figure 11.27). The airplane is all metal construction with fabric-covered control surfaces and an enclosed cockpit over the wing. The landing gear is in the tailwheel, and all three wheels are nonretractable. The single engine is a 1,300-horsepower Mitsubishi Kinsei 54, 14-cylinder radial engine driving a three-blade metal propeller with spinner (Figure 11.28 and 11.29). Armament is two fixed, forward-firing, 7.7-millimeter fixed machine guns in the engine cowling; one rear-trainable 7.7-millimeter machine gun and up to 816 pounds of bombs mounted on the wings or below the fuselage.

This Val was part of the Raid IV from the Japanese carriers during the afternoon of June 19, 1944, during the battle of the Philippine Sea. The raid was misdirected to a point south of the American carriers. After reaching the anticipated point of contact and finding nothing, 49 of the Japanese planes turned toward the fields of Guam and jettisoned their bombs. This flight of 20 Mitsubishi A6M5 Zeros, Val dive bombers, and 2 Nakajima B6N1 Jill torpedo bombers approached Guam at 1500 to be met by numerous U.S. Navy F6F-3 Hellcat fighters: 12 from COWPENS, 12 from ESSEX, 19 from HORNET, 8 from ENTERPRISE, 4 from SAN JACINTO and a few from PRINCETON. Thirty of the forty-nine Japanese planes

.....
⁵This section on aircraft resources was written by David T. Lotz.

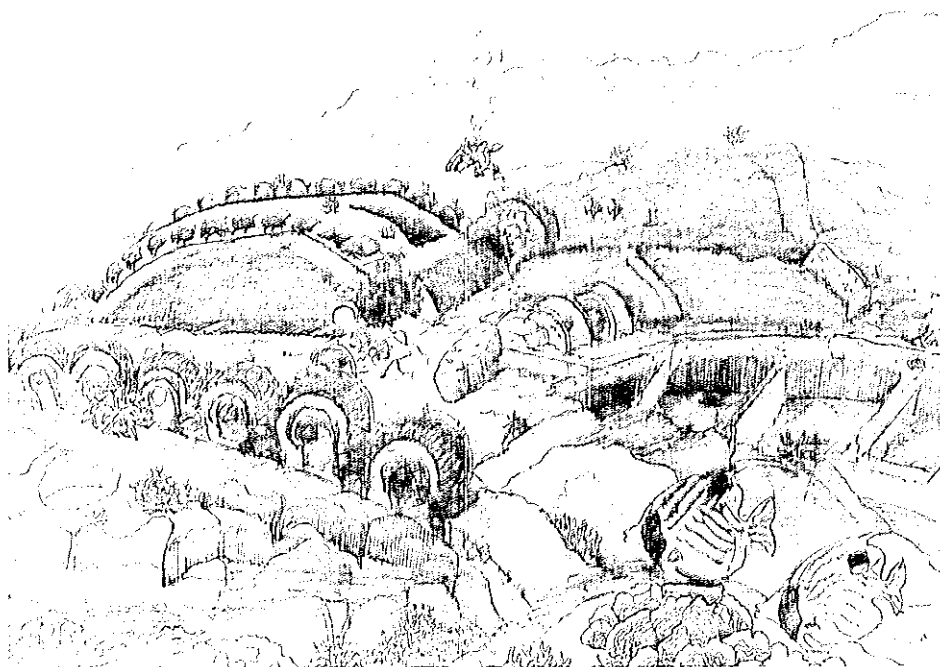


Fig. 11.25. Artist's perspective drawing of abandoned tracked vehicles off Apuntua Point. (Drawing by James R. Roybal)

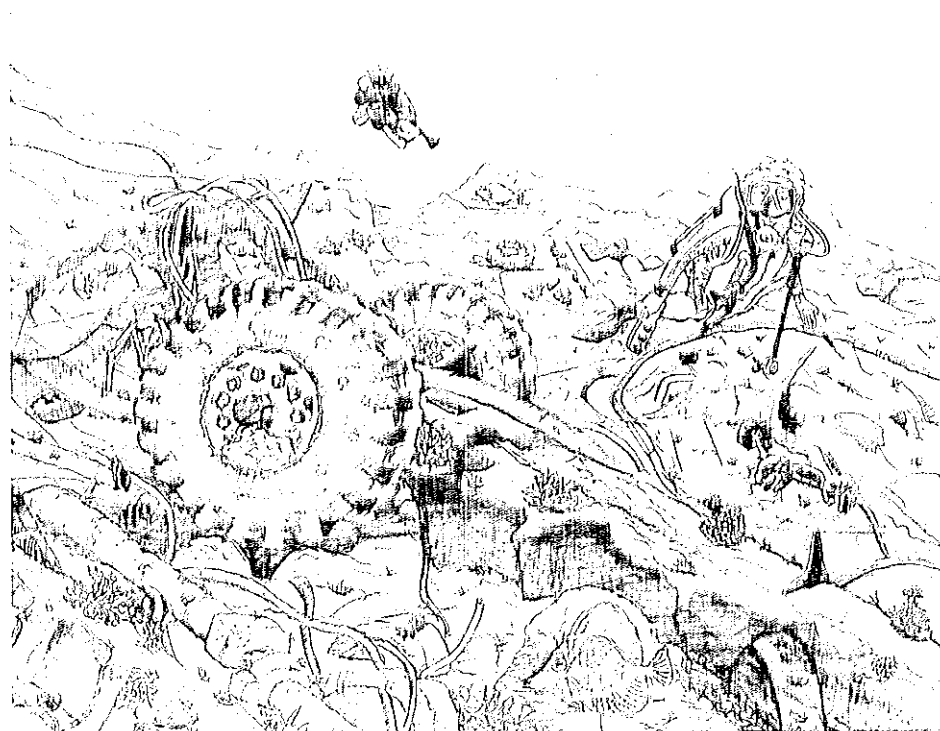


Fig. 11.26. Artist's perspective drawing of abandoned truck chassis at Apuntua Point. (Drawing by James R. Roybal)

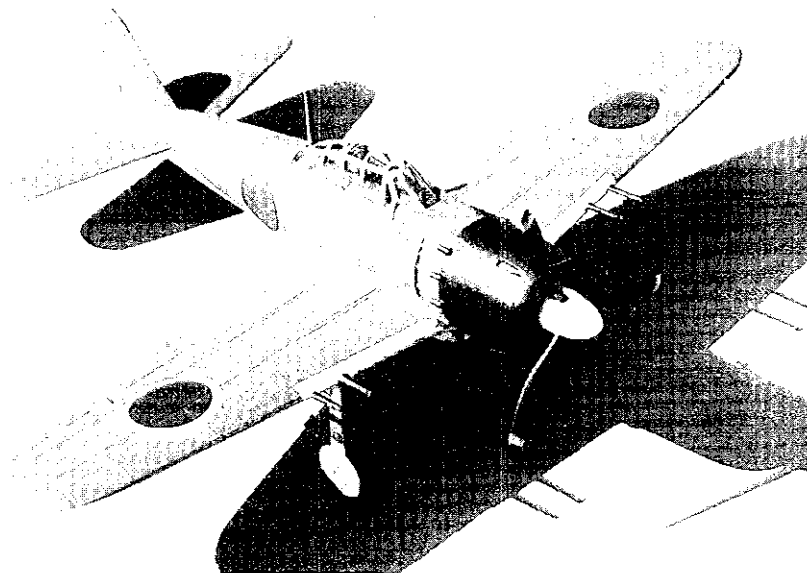


Fig. 11.27. Japanese Navy Aichi D3A2 dive bomber model.
(Photo of by David Lotz)

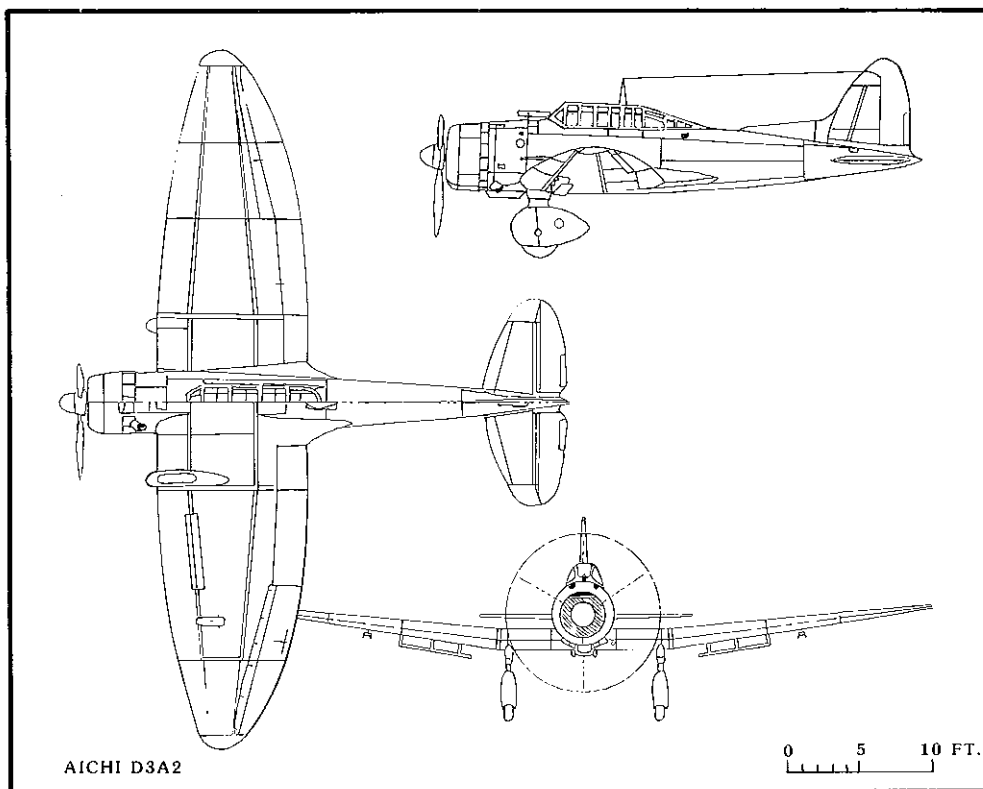


Fig. 11.28. The Aichi D3A1 was used in the Battle of the
Philippine Sea on June 19, 1944. (Courtesy of U.S. Naval
Institute)

never made it to Orote Field, having been shot down by the U.S. Navy fighters.

One Val that was shot down, landed on the water and sunk in outer Apra Harbor on the harbor side of Glass Breakwater and now lies in 80 to 90 feet of water. The plane is buried nose first into the bottom with its tail and fixed landing gear pointing into the air. A good portion of the tail section is missing.

Some coral grows on the plane, but for the most part it is distinguishable as a Val. A swim to the left of the wreck brings one to the separate wing, again with its fixed landing gear intact. Both wheels have a portion of the tires on them as well.

Many years ago, there was an unsuccessful attempt to raise the plane. Before this attempt, the plane rested upright on the bottom. The unsuccessful attempt not only resulted in the separation of the wing but also flipped the Val upside-down.

Japanese Navy Mitsubishi A6M5 "Zero"

The remains of a second aircraft, a Japanese Navy Mitsubishi A6M5 Zero fighter, are lying on a reef just north of Umatac. The single-seat carrier- or land-based fighter is a cantilever low-wing monoplane. The airplane is all metal except for fabric-covered tail control surfaces. The aircraft has retractable tailwheel landing gear and an enclosed cockpit over the wing (Figure 11.30). The single engine is a 1,130-horsepower, Nakajima NK1F Sakae 21 14-cylinder, radial engine driving a three-blade, metal propeller with spinner. Armament is two 7.7-millimeter machine guns in the upper fuselage decking and two wing-mounted 20-millimeter cannon.

The Zero was probably based at Orote Field as part of the 61st Air Flotilla. Residents of Umatac, the nearby village, say the plane took off from Orote, was shot down by a U.S. fighter and crashed in Fouha Bay. Today the Zero sits upright in 40 feet of water on the reef.

Two of the three blades of its propeller rest in the coral. The engine is exposed, and the canopy is no longer in place. One wing is half its normal length, and the instrument panel is without instruments. These instruments and other items have been taken by divers over the years.

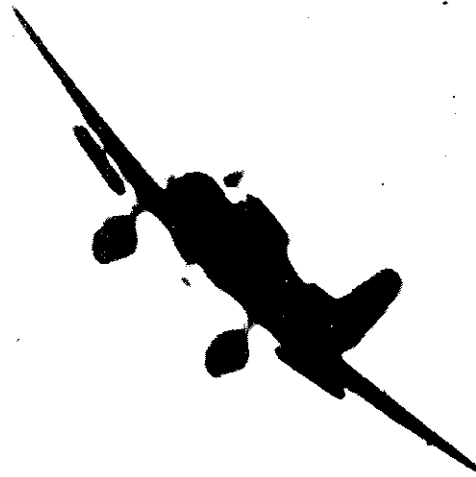


Fig. 11.29. "Val" dive bomber in action. (Courtesy of USAR collection)

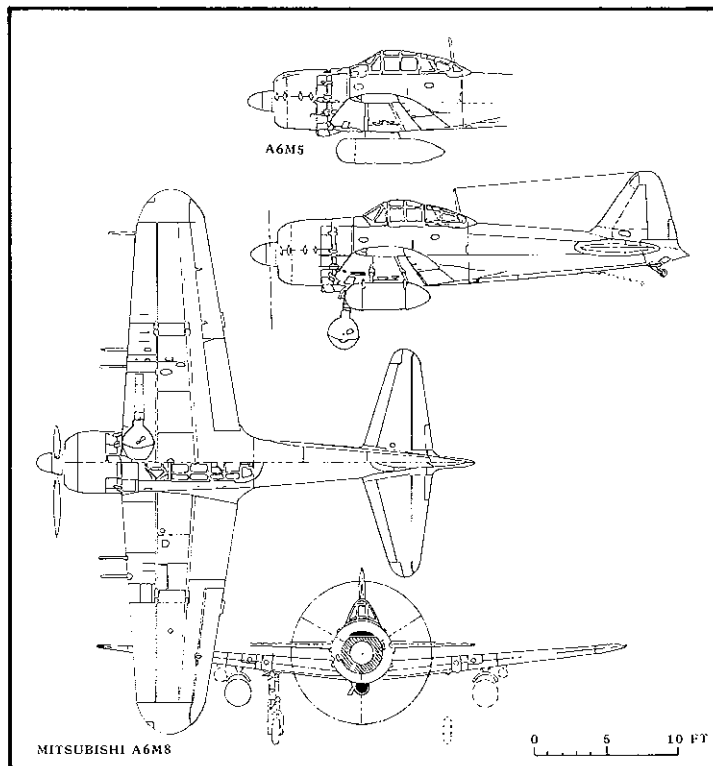


Fig. 11.30. The Japanese Mitsubishi A6M8 and A6M5 fighter Zero, was used throughout the Pacific theater. (Courtesy of U.S. Naval Institute)

Apra Harbor

Administrative Status

Sites located both within Apra Harbor and immediately outside the harbor mouth are on submerged lands under the jurisdiction of the U.S. Navy. These include the materiel dump site off Apuntua Point. Other sites discussed above are on lands under the jurisdiction of the Government of Guam.

Present Threats and Impacts

Active sport diving on all sites around Guam is a potential threat. Although efforts have been made and continue to be made to preserve sites, depredation since the 1960s has resulted in the removal of most portable artifacts as well as brass fittings, instruments, gauges, etc., from all sites. Today the heaviest impact is diver visitation; the numbers of divers touching, bumping up against, and handling features remaining on the sites will accelerate their deterioration.

Caroline Islands

Investigations of submerged cultural resources other than shipwrecks were undertaken only within the Republic of Belau. Also included in this section, however, is a brief discussion of the well-known prehistoric village site of Nan Madol on Pohnpei, in the Federated States of Micronesia.

Republic of Belau

From April 11 to June 17, 1988, archeologists from the National Park Service Submerged Cultural Resources Unit supervised field operations aimed at identifying significant underwater archeological sites. During the course of field operations, several sites were visited. Site selection was based upon accessibility and type; the aim was to look at a variety of site types, in a number of locations, in order to gain a broad understanding of the potential resource base. The sites are arbitrarily numbered for identification on Figure 11.31.

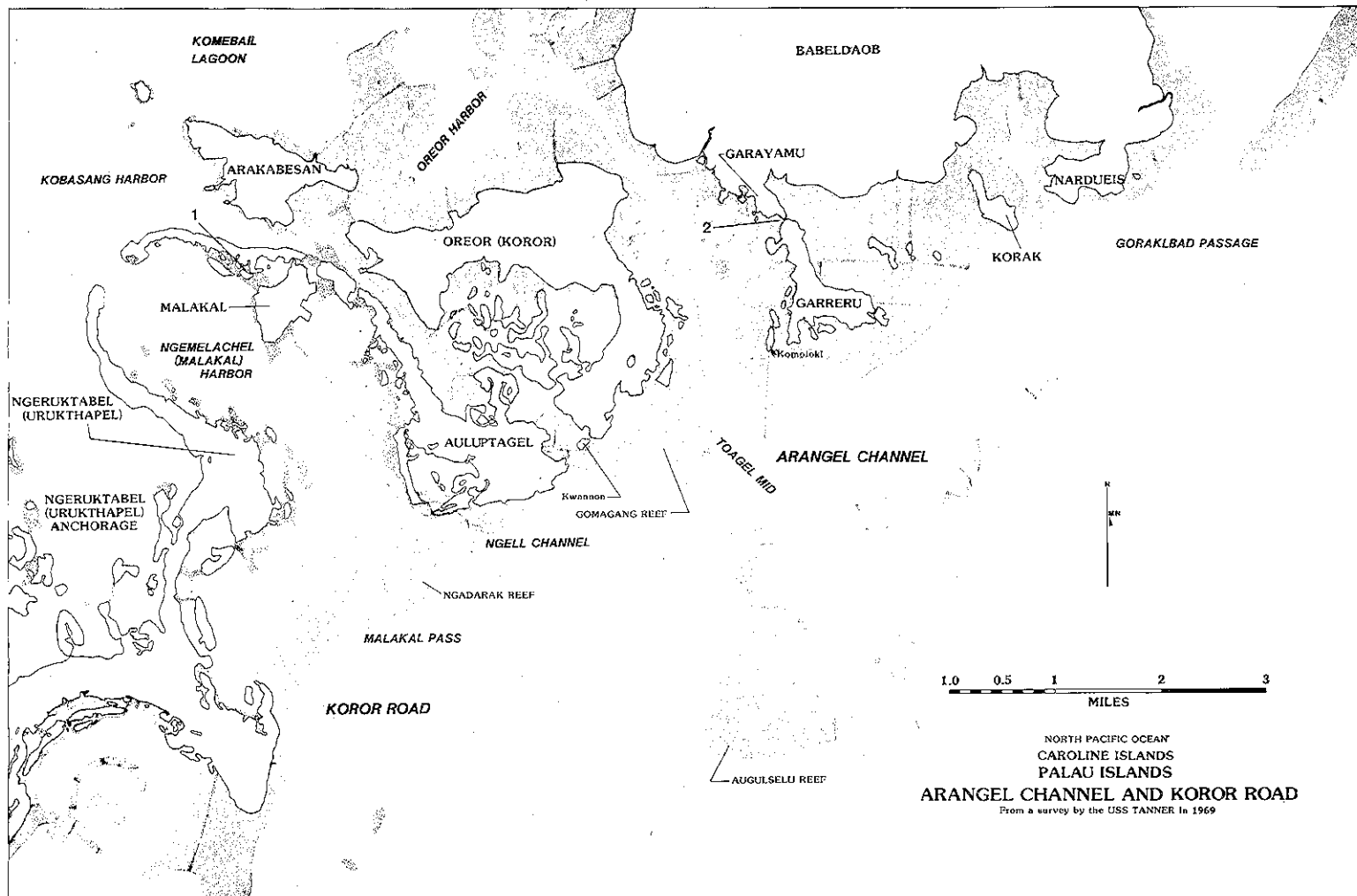


Fig. 11.31. Base map of other sites in areas of Ngemelachel (Malakal) Harbor, Oreor and Babeldaob, Belau.



Fig. 11.32. Bombed-out Japanese communications center on Beliliou. (NPS photo by Dan Lenihan)



Fig. 11.33. Remains in the water include aircraft and landing craft wreckage in the shallows. (NPS photo by Ken Vrana)



Fig. 11.34. Cave in which Japanese holdouts were imported by advancing American troops on Pelilou. Vince Blaiyok at cave entrance. (NPS photo by Dan Lenihan)



Fig. 11.35. Shrines to Japanese soldiers inside cave at Pelilou. (NPS photo by Dan Lenihan)

Site-Specific Investigations

Site Number 1: Japanese Type "A" and "G" Landing Craft⁶

The remains of 11 landing craft and utility boats are present on the bottom and along the shores of four small coves and narrow channels located on the north side of Ngemelachel (Malakal) Harbor (refer to Figure 11.31). These remains are in varying states of preservation, ranging from intact to predominantly destroyed. All of the sites are in slightly cloudy water, 15-20 feet deep, and surrounded by heavily wooded, overhanging stone walls. A variety of corals cover the bottom, and large numbers of jellyfish were present as well.

No chart we had access to accurately showed each of these coves and channels, although all are within the general larger inlet designated on Figure 11.31. The following discussion describes the boats and locations in the order visited during the 1988 survey. Arbitrary cove designations are used to differentiate between the sites.

Two Daihatsu type "A" landing craft lie scattered and severely decayed on the west side of cove number one, opposite the entrance. Only the double-keel design of the bow allowed identification of this site because large pieces of structure lie jumbled about. Several 8-foot-long, 12-inch-diameter riveted-steel, pressure cylinders lie interspersed with the wreckage. These may be high-pressure air cylinders for starting diesel or gasoline engines and are a good indicator of the engine type once fitted.

Another more complete Daihatsu type "A" rests with its stern bent upward at an angle against the left side of the cove. This landing craft has its bow ramp down and is identifiable as the variant of the basic design believed by U.S. Navy Intelligence to be used by the Japanese Army (Figure 11.36). The wreck measures 44 feet long from the angular, projecting side at the bow to the upward-bent, counter stern (Figure 11.37). This measurement compares well with the 49-foot, 4-inch recorded length of such craft. The half-round armor shield that protected the coxswain lies dislodged on deck forward of this position at the athwartships bulkhead. Five square viewing ports are cut through the armor plate of the

⁶The discussion of Japanese landing craft in Malakal Harbor and the Aichi E13A1 "Jake" float plane in Babeldaob were written by Kevin Foster.

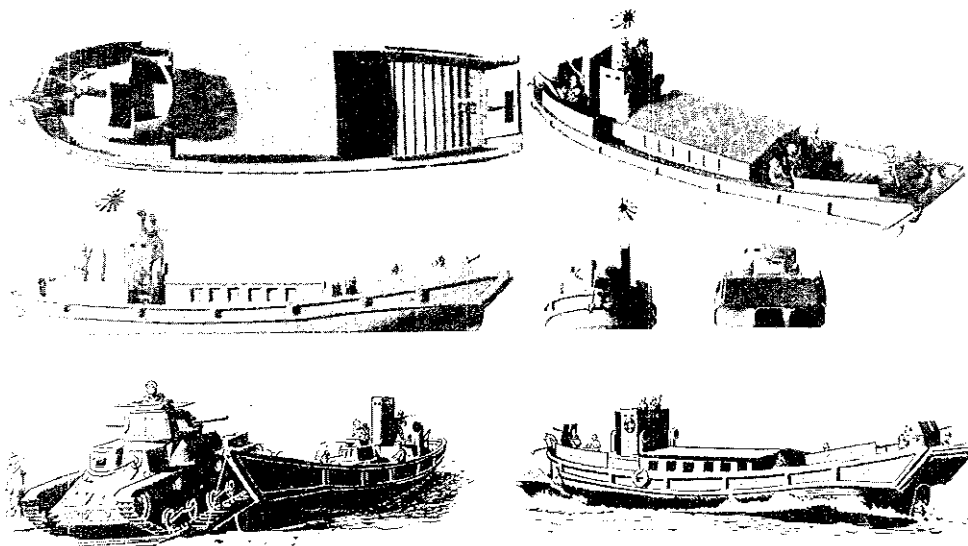
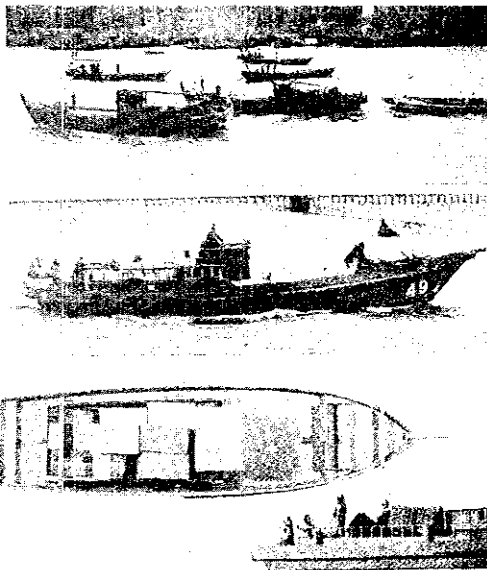


Fig. 11.36. Japanese type "A" landing craft found in Belau.
 (Photo courtesy of U.S. Naval Institute)

TYPE "G" LANDING CRAFT



Length:	52'1" o. a., 43'9"	Armament:	
	w. l.		
Beam:	13'3"	Armor:	None.
Propulsion:	Gasoline engine.	Notes:	The straight or curved
Speed:	8 Knots.		prows observed in earlier types
Capacity:	Approximately 50		appears to have been abandoned
	men.		for a curved bow, better able to
			withstand impact.

Fig. 11.37. Japanese type "G" landing craft sunk in a small
 cove on the north side of Ngemelachel (Malakal) Harbor.
 (Photo courtesy of U.S. Naval Institute)

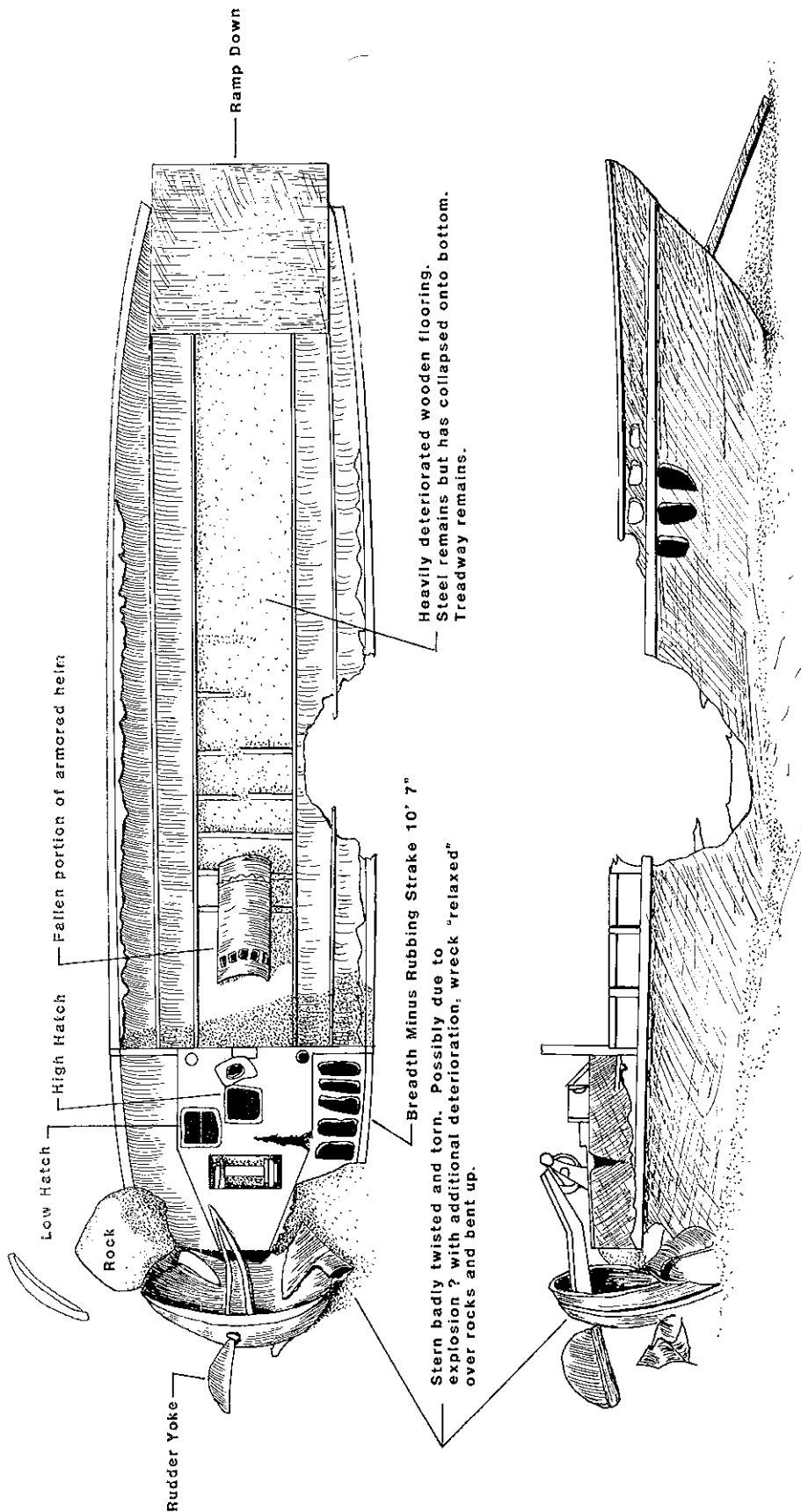
shield. Gaps in the armored engine compartment aft revealed a multicylinder engine in place. A single davit is mounted at the extremity of the stern. The wooden bulwarks of the boat are soft to the touch, and some thinner portions have completely deteriorated.

A diesel engine, about 8 feet by 4 feet by 2 feet, lies on the bottom in about 10 feet of water roughly 100 feet from the bow of the most intact type "A" Army landing craft. Other small items, including a small pipe davit and a complete exhaust system with muffler, lie nearby.

Three other wooden hulls lie on the bottom of this cove. All are similar to one another and are sharp at both ends. These appear to be Japanese type "G" landing craft (Figure 11.38). All of these wrecks have severely deteriorated. The remaining portions of the wooden keel, frames and keelson of each boat are roughly 40 feet long. Raking stem and sternposts rise from the keel, but only the bottom few feet of the hull exist. The most prominent features of these type "G" wrecks are the large rectangular, armor-plated, fuel tanks, which surround three sides of the engine. Several individual wrecks are missing one or more of these fuel tanks, but all appear to have once been fitted with seven tanks: three on each side and one forward. Only one wreck retains the engine. This is a large, two-cylinder gasoline engine in place on the boat nearest the right side of the cove.

A second cove, discovered by accident during an attempt to return to cove number one, is much smaller and narrower. It contains the remains of two partially submerged type "A" landing craft. A type "G" landing craft lies sunk in 15 feet of water just outside the cove. The two type "A" boats lie in line ahead in the shallow water along the shore with the front boat mostly exposed and the rear boat slightly submerged. The front boat retains the armored coxswain shield. Both are mostly intact although they have lost most of their bulwarks and much of the wooden decking. The jointed ramps of both boats are extended with the ramp of the rear boat lying over the stern of the front boat. Although the description of these boats is similar, they are not identical to each other. The front boat has an elegantly curved bulkhead with rolled edges separating the engine compartment from the rest of the boat, while the rear boat has a straight angular bulkhead with cut edges in the corresponding space.

The type "G" boat outside the cove was only quickly surveyed and appears to be in a similar state of deterioration as the others observed in coves one and four.



Imperial Japanese Navy Landing Craft O.N.I. "A" Army Variant

Fig. 11.38. Japanese Navy landing craft type "A," Army variant sunk in a small cove in Belau. (Sketch by Kevin Foster)

Cove number three was discovered during a search for cove number one. The cove has a very small entrance and is almost perfectly round. It contains a single type "A" landing craft wreck in 20 feet of water along the shore across from the cove entrance. The wreck is in good condition and retains an unusual, hollow, helical screw propeller. This wreck is the same length and breadth as the other type "A" landing craft but is built deeper, probably to provide enough buoyancy to carry heavier vehicles. No coxswain shield was found at this site.

The search for more landing craft revealed one more tiny cove with a single type "G" boat at the entrance. This cove is just off the back channel leading to the boat yard. Three side and one centerline fuel tank remain to the side of the large two-cylinder gasoline engine, transmission and shaft.

Site Number 2: Japanese "Jake" Float Plane

The disarticulated remains of a Japanese seaplane lie on the bottom and along the shore of a small cove on the southern shores of Babeldaob in Irrai (refer to Figure 11.31). Measurements and photographs of the pieces allowed this wreck to be identified as an Aichi E13A1, single-engine, twin-float reconnaissance seaplane. This type was in use aboard a number of large warships based at Belau as well as with a number of units flying from shore bases. Three manufacturers built a total of 1,418 of these aircraft, making it the most numerous Japanese float plane. Known to the Allies as "Jakes" (Figure 11.39), they were used for long-range reconnaissance (for the attack on Pearl Harbor), bombing missions, air-sea rescue, staff transport, shipping attack and Kamikaze missions.

The aircraft remains lie scattered on the cove bottom in 2-3 feet of water in soft sediments. The left float rests upright in the center of the cove while the right float is about 50 feet away on the shoreline. Both floats show considerable corrosion but the right float appears to have been exposed to great heat as well. Aluminum portions of the wreck are less corroded than are the steel parts.

A large radial engine with two rows of cylinders and a three-bladed propeller lies behind the left float in the center of the cove. Exhaust pipes from the cylinders are in place, but no signs of the engine mount or the main portions of the fuselage or tail were visible. Several small pieces of piping and structural aluminum were scattered on the bottom near the engine, along with half of what appears to be a machine gun mounting ring. The two wings lie upright on the bottom to each side of the engine. The right wing has loose and missing skin in several spots, and a large length

of the leading edge assembly is detached but nearby. The left wing is more complete but does not have a length of the steel wing spar extending beyond the wing root as does the right wing.

No evidence of bullet or shrapnel damage could be detected in the wings or floats. The presence of apparent fire damage and lack of projectile damage suggest that this aircraft may have been scuttled intentionally or destroyed by accident. No historical sources that mention the destruction of this aircraft have yet been identified.

Positive identification of the site was made by Robert C. Mikesch, senior curator of the Aeronautics Department of the National Air and Space Museum, Smithsonian Institution. The design of the float struts and the placement of a single step on the forward side of the front strut were mentioned as diagnostic for this type of aircraft.

Site Number 3: Sunken Village of Ngibtal

An effort was made to locate the remains of the sunken village of Ngibtal on the east side of Babeldaob north of Melekeiok (Figure 11.41). The legend surrounding the site, described by Vince Blaiyok, Division of Cultural Affairs, is as follows:

Milad, the granddaughter of Matmikiak, lived on the islet of Ngibtal off Babeldaob. She possessed a magic breadfruit tree with a hollow trunk that reached down into the lagoon. Once in a while a large wave forced up through it a large fish, which provided food for the village.

In time people became jealous and with clamshell axes, cut down Milad's magic tree. The ocean poured in through the stump flooding the island, which sank below the sea (Blaiyok 1988, personal communication to T. Carrell).

After consulting with the village chieftain and elders, National Park Service and Division of Cultural Affairs archeologists made a dive in the area of the site. Daniel Lenihan later reported:

Nothing was seen on the dive that would lend support to the legend of a sunken village, but it should be noted that sea conditions were rough and there was

nothing comprehensive or systematic about the examination. Although this dive would not be sufficient to base a decision on, it has come to our attention that the area in Ngibtal was also examined by Frances Toribiong and Richard Marksburg. Having read that survey report, which was more intense and systematic, coupled with our own on-site reconnaissance, I can state with a reasonable degree of confidence that there is no evidence in this area of a sunken village site (1988:12)

Site Number 4: Japanese G4M "Betty" and Other Aircraft Wrecks

A large amount of disarticulated aircraft wreckage lies strewn about the reef on the northeastern side of Beliliou near the tiny island of Ngargersiul (refer to Figure 11.41). Photographs and measurements taken on May 26 and 29, 1988, allowed the wreckage to be identified as that of at least two G4M "Betty" bombers (Figures 11.40, 11.42 and 11.43) and other unidentified, smaller, twin-engined aircraft. Wreckage from two fighter aircraft, probably Japanese Zeros, serves as lawn decoration in Klouklubed village on the northern tip of Beliliou. Other aircraft wreckage was reported to be located in the mangrove swamps on the eastern side of Beliliou and outside the reef near Koska village but could not be visited in the limited time available.

Site Number 5: Beliliou Near-Shore Survey and Beliliou Wall⁸

Historical research indicates that a large number of amphibious vehicles were destroyed on the reef and just offshore during the recapture of Beliliou.

The first Marines landed on White Beach 1 at 0832, only two minutes behind schedule. Within four minutes troops were ashore on all the beaches and were met by heavy rifle, machine-gun and

⁷This brief discussion of Japanese aircraft wrecks was written by Kevin Foster.

⁸The discussion of the Beliliou near-shore surveys and Beliliou Wall were written by Daniel J. Lenihan.

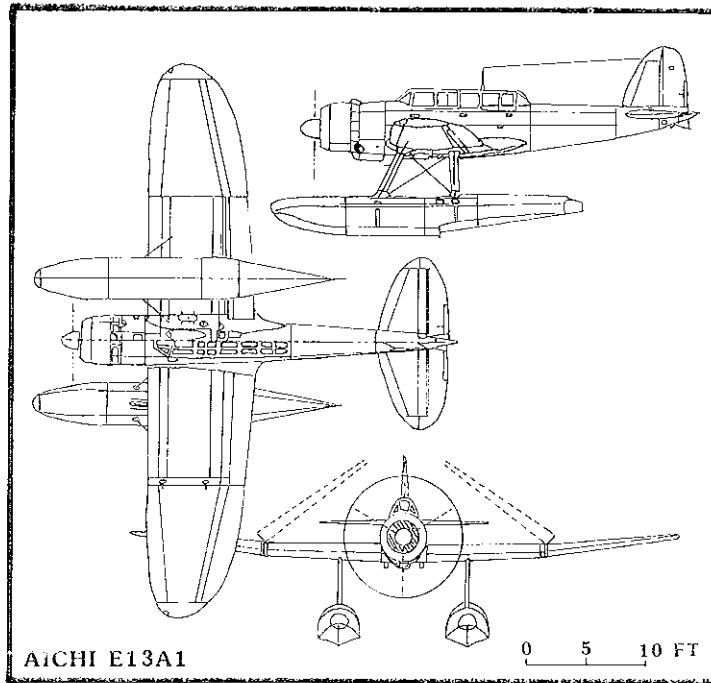


Fig. 11.39. The remains of this type of Japanese float plane, Aichi E13A1, code-named "Jake," were found in shallow water off Babeldaob in Belau. (Drawing after Francillon)

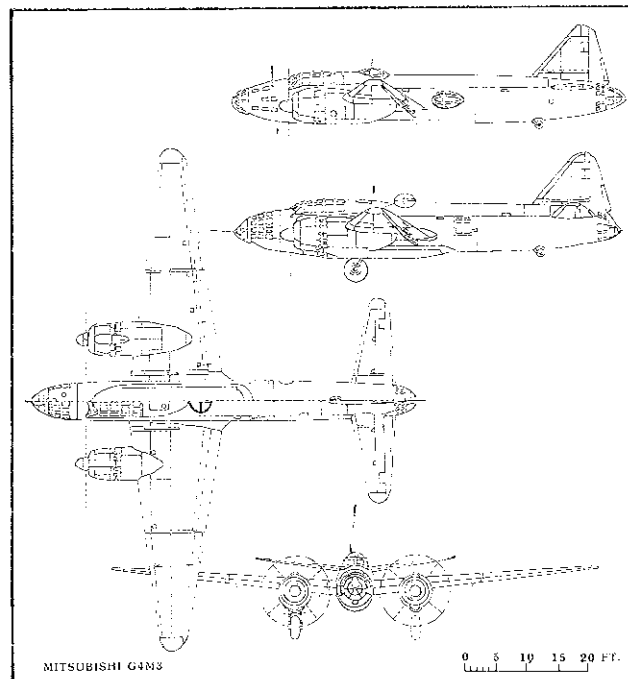


Fig. 11.40. Remains of a Japanese "Betty" bomber were identified on Beliliou near the island of Ngeregong. (Drawing after Francillon)

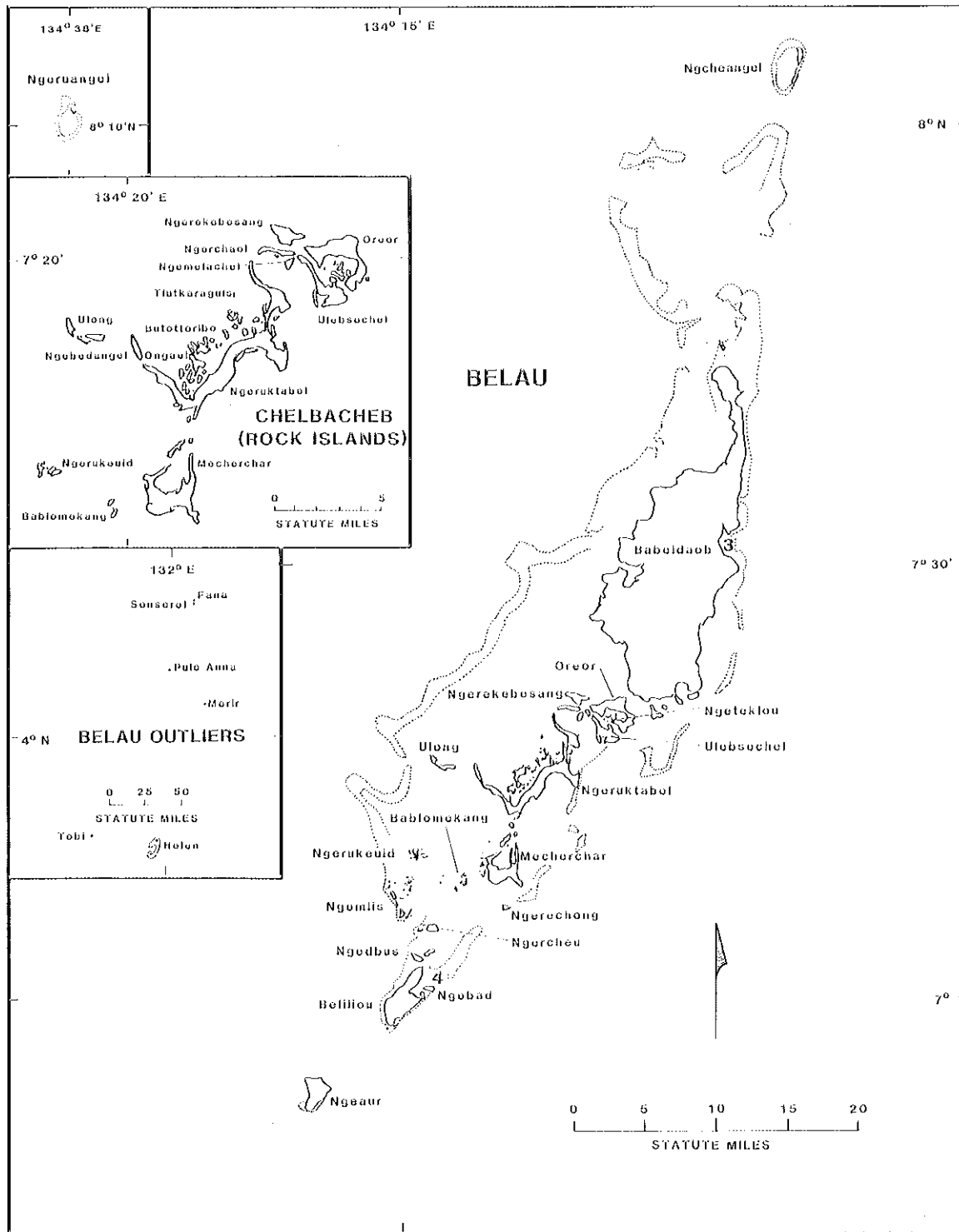


Fig. 11.41. Locations of other investigated submerged cultural resource sites in Belau.

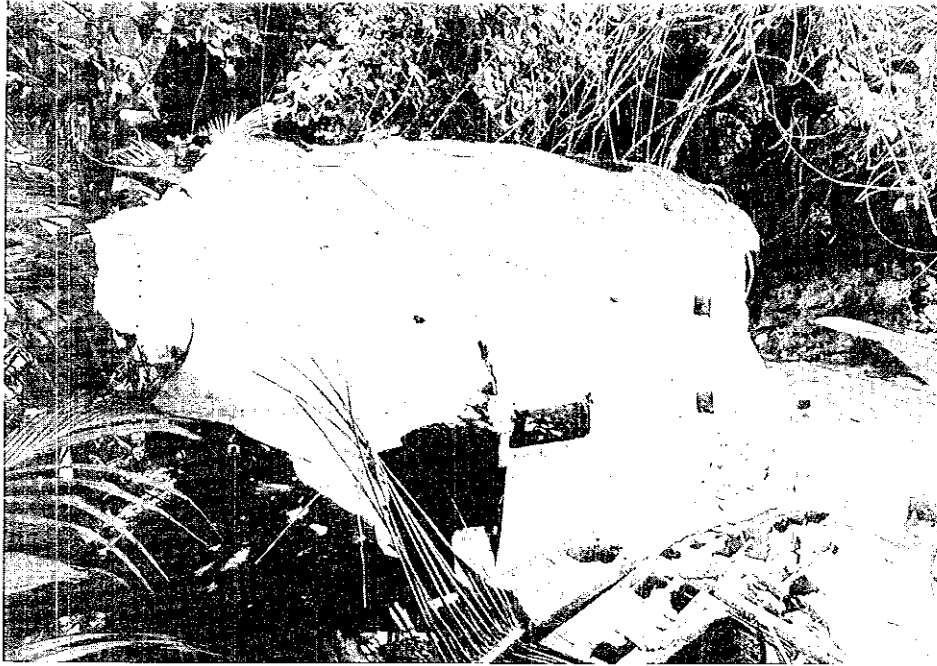


Fig. 11.42. Looking forward at wing root and fuselage. Bullet holes visible below two small square openings. (NPS photo by Kevin Foster)

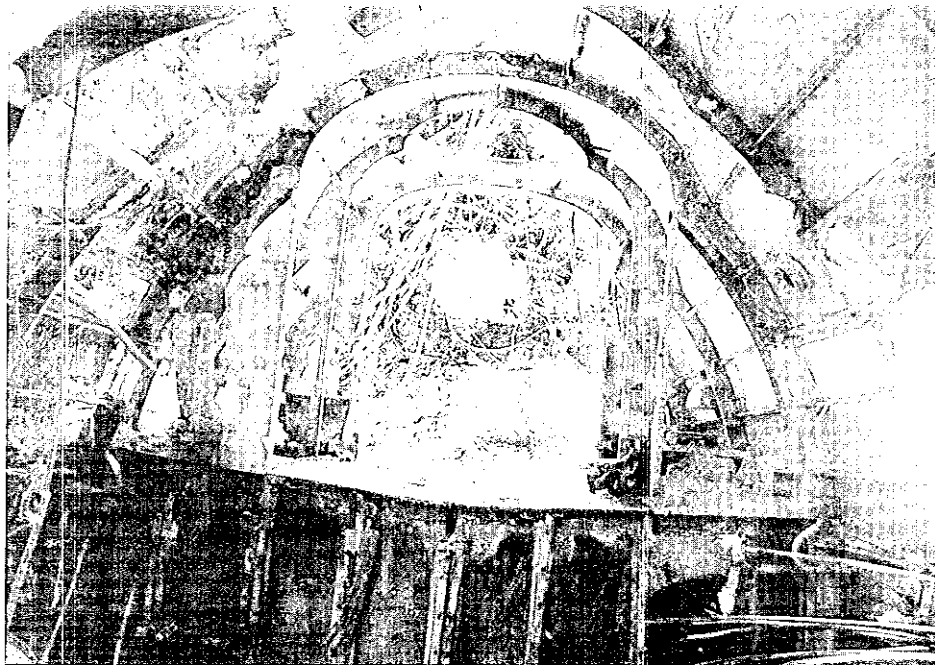


Fig. 11.43. Interior of G4M "Betty" bomber, looking forward. (NPS photo by Kevin Foster)

mortar fire, especially on White 1 and Orange 2. ...The primary targets for the Japanese were the landing craft. ...The official report placed the number of LVTs destroyed at 26, but unofficial accounts ranged upward of 60. The discrepancy is in part accounted for by the Marines' ingenuity in getting damaged LVTs back in action and, perhaps, by the observers' inability to distinguish between LVTs and DUKWs. Although waves two through six landed on schedule, subsequent waves were held up because of the losses of LVTs (Wheeler 1983:5.69).

The instrument boat, MESIKIU, was used to make a magnetometer survey of the area just offshore from landing beaches White and Orange (Figure 11.47) to locate these and any other wrecks near shore. The first lane was set to run over the area close to the reef line where the fathometer read 30 feet. This lane was moved out to water reading 50 feet and deeper halfway through the run after a prominent coral head snagged the tow fish. After no indications of wreckage were found, lanes were run 50 yards and 100 yards offshore.

The second search method used scuba divers in a line abreast swimming along the reef edge. A second, faster and handier boat was used to accompany the divers on the surface as they searched. The area between shallow water and the reef drop-off of the three Orange beaches was examined. This examination confirmed the negative magnetometer findings. Only three, small, metal objects were found on the survey.

Conversations with Capt. Pablo Siangeldep and Faunny Blunt revealed that in addition to the considerable salvage and cleanup effort of the American military on Beliliou, a "Chinese" company had worked on contract to remove wreckage from the reef and beaches. Wreckage removed from the beaches was dumped into the extremely deep waters in the channel between Beliliou and Ngeaur (Angaur).

An ROV (remote operated vehicle) dive to a depth of 450 feet was also conducted at the Beliliou drop-off on the southern end of the island where the sheer reef wall fringes the shore (Figures 11.44, 11.45 and 11.46). No cultural remains were observed; however, the rich natural resource base here makes for an extraordinary dive. NPS divers also swept this area to a depth of 100 feet and noted many large, free-swimming fish and healthy coral growth.



Fig. 11.44. ROV being tended from surface by Belau Historic Preservation Office employee Thomas Techur. (Photo by Barb Lenihan)

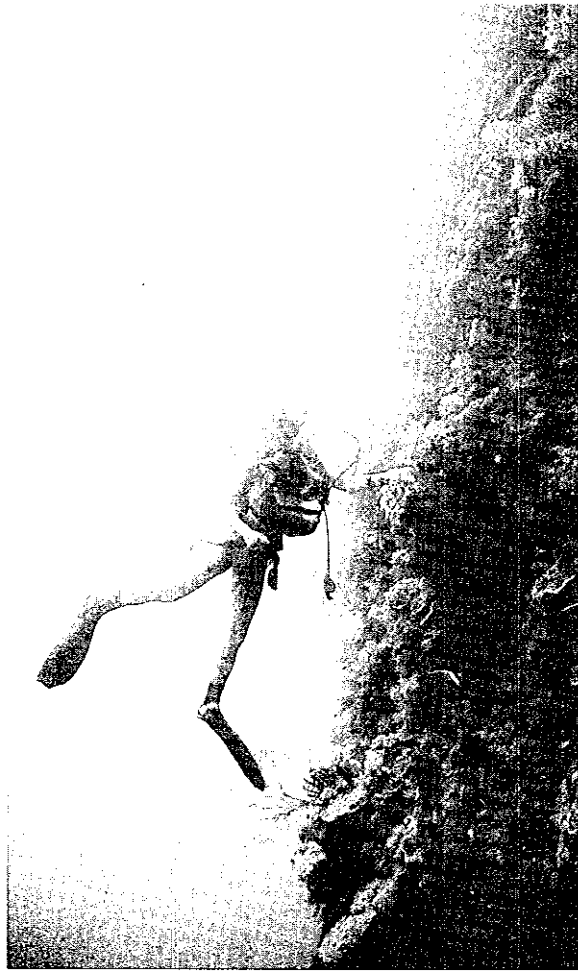


Fig. 11.45. Diver on Pelilou Wall at 100 feet deep illustrates the steepness of this feature, which continues to about 1,000 feet deep. (NPS photo by Dan Lenihan)

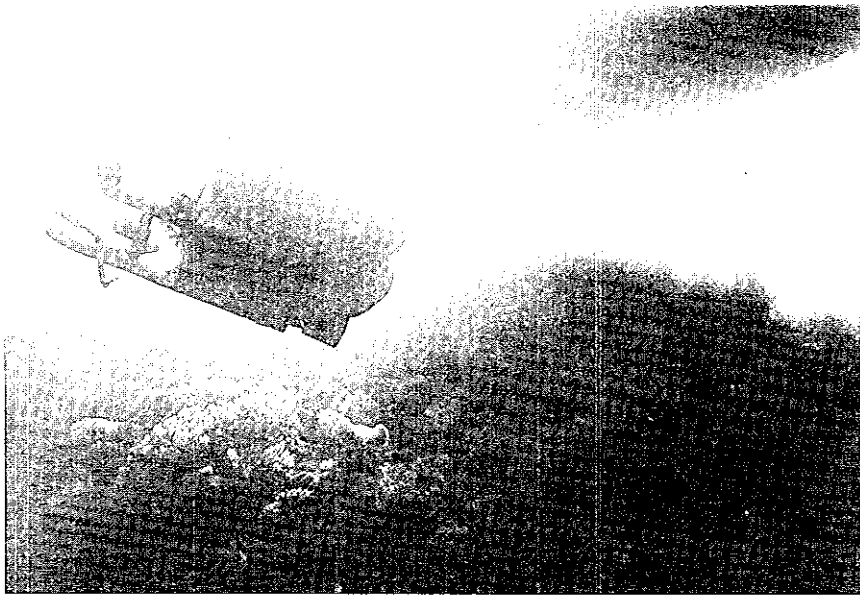


Fig. 11.46. ROV heading down from survey boat. (NPS photo by Dan Lenihan)

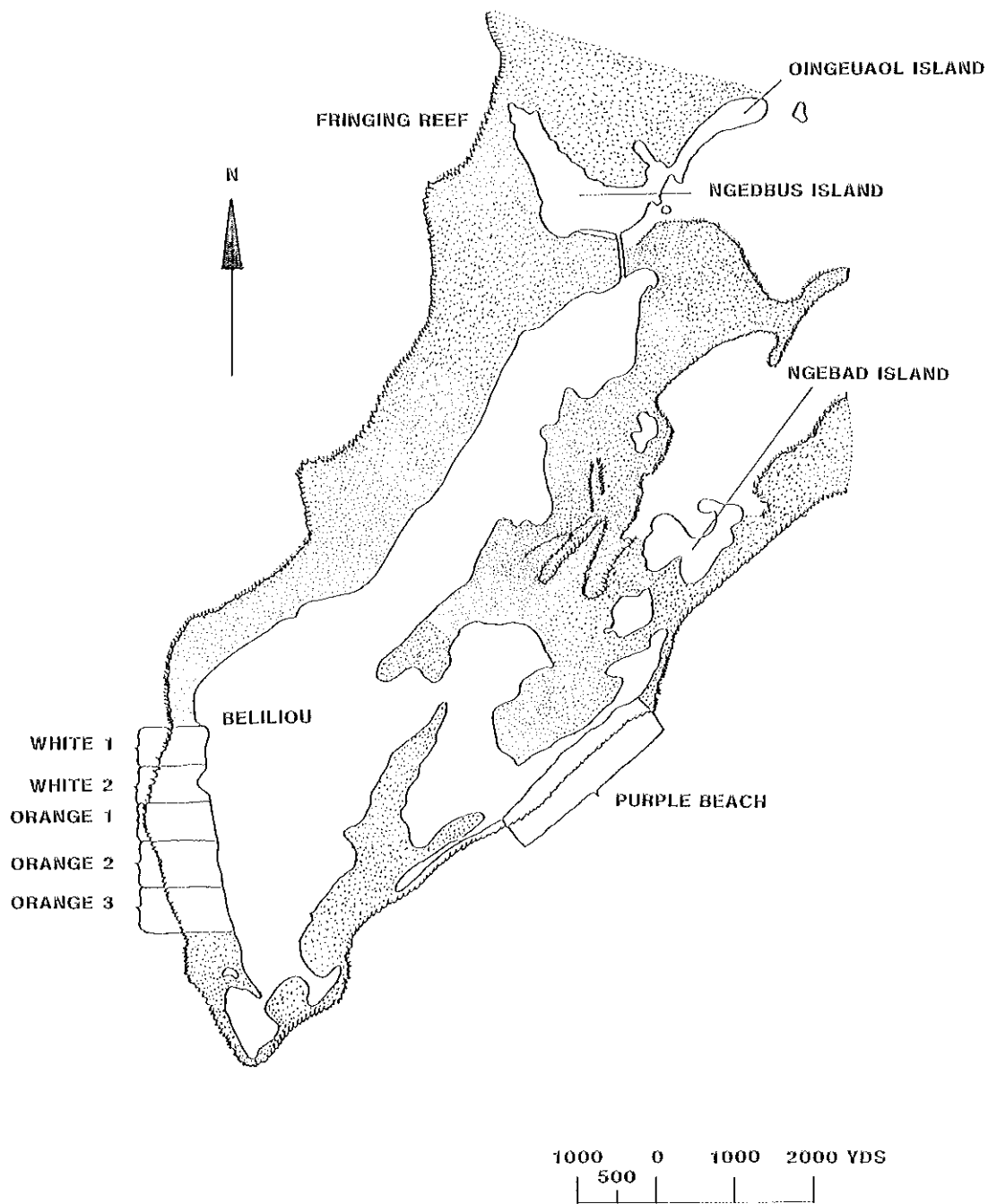


Fig. 11.47. Location of "White" and "Orange" landing beaches on Belilieu.

Administrative Status

Title to all cultural resources is held by the Republic of Belau. An effort is being made to inventory sites and to place significant ones in a Belau National Register; as of this writing, it is not known whether any of the above sites are in that register.

Present Threats and Impacts

Although the World War II shipwrecks consistently receive the most attention from sport divers, these nonshipwreck sites are being impacted by the snorkeler or day picnic excursion group. Most, if not all, of the portable-artifacts, brass fittings and instruments have been removed or salvaged from the airplanes and landing craft. What remains of the sites is undergoing natural deterioration from the elements, somewhat accelerated by visitation.

Federated States of Micronesia

State of Pohnpei

Although field investigations were never undertaken by members of the National Park Service, the well-known ruins of Nan Madol have been receiving continuous archeological investigation since 1978. Under the direction of Dr. William S. Ayers of the University of Oregon, both the land and underwater portions of the site are being thoroughly researched (Ayers 1990:59-63).

Located in a lagoon on the eastern shore of the island, this site has excited the imagination of visitors and scholars since it was first reported to Western readers in the mid-1830s.

... There are at the northeast end of the island, at a place called Tamen, ruins of a town, now only accessible by boats, the waves reaching to the steps of houses. The walls are overgrown with bread, cocconut [sic], and other ancient trees, and the ruins occupy a space of two miles and a half. The stones of these edifices are laid bed and quoin, exhibiting irrefutable traces of art far beyond the means of the present savage inhabitants. Some of these hews stones are twenty feet in length by three to five each way, and no remains of cement appear. The walls

have door and window places. ...Asked about the origins of these buildings--the inhabitants say, that they were built by men who are now above (reprinted from the Hobartown Courier in The Sailor's Magazine and Naval Journal, New York, January 1837:9,166; in Ward 1967(6):121).

In 1840 a Mr. Campbell, in the cutter LAMBTON from Sydney, visited the site and observed:

On the southern side of the island, and within one mile of the harbor of Metaleline, are extensive ruins, boasting perhaps an antiquity as great as that of the Pyramids of Egypt; being, beyond a doubt, the work of a race of men far surpassing the present generation ... whose greatness and whose power can only now be traced from the scattered remains of the structures they have reared ... leaving to posterity the pleasures of speculation and conjecture.

The principal building is a triple quadrangle structure; that is there are three buildings one inside the other, occupying an area of about one hundred yards square. ...There is only one entrance to the building, which is on the side opposite to that fronting the sea. ...Opposite the building on the side fronting the sea is a small harbor ... and a strong abutment or breakwater is built, inside of which a vessel of considerable size might anchor ... the whole forming the labor of an age, in contemplating which, the mind is filled with astonishment (The Polynesian, July 11, 1840:1, 3, 17 in Ward 1967(6): 126-139).

Based upon Ayers' research, the initial construction on the site has been dated to about A.D. 500. More than 100 stone structures constitute Nan Madol, which was erected offshore on islets built up from a flat coral reef. In Pohnpeian "madol" means spaces between objects; the name Nan Madol thus means the place of spaces, which refers to the waterways and spaces between the artificial islets (Jenks 1970:7).

Elaborate residential and ceremonial complexes are surrounded by tombs and walls and cut by channels. The site attests to

the power once held by chiefs to organize and control the local peoples. Rank and privilege are clearly evident by the presence of beads and other ornaments in the residential and ceremonial structures. Ayers and his colleagues have recovered "... several thousand objects, including large numbers of beads and shell tools, thousands of potsherds, stone pounding tools, some rare bone artifacts, and the remains of such prestige foods as giant parrotfish and dog" (1990:62).

According to Ayers, Pohnpei's oral tradition also describes underwater channels connecting the site to Nahkap Bay to the northeast. In addition, archeologists are investigating reports of 12 vertical columns forming a row in 100 feet of water off the site and the possibility that underwater tunnels and other architectural features may exist.

Administrative Status

Cultural sites in the Federated States of Micronesia are under the jurisdiction of the various states and are accorded protection under legislation in force on the islands.

Present Threats and Impacts

A major cultural resource on Pohnpei, Nan Madol is protected from the activities of salvagers or pothunters. The major impacts to the site come from visitation. Little diving has been reported in the area of the columns.



CHAPTER XII.
MANAGEMENT RECOMMENDATIONS AND CONCLUSIONS

By Toni L. Carrell

Introduction

The challenge of working in Micronesia is both a deterrent and an asset. The conditions are difficult, the islands remote and the funding limited. However, because they have been "off the beaten path," many of the submerged cultural resources of Micronesia are yet to be discovered. The islands have the opportunity to set up model programs, learning from the mistakes of others, for the protection and preservation of this aspect of their cultural resources base. They are already actively involved in the inventory of land resources, and the mechanisms already exist to protect their cultural heritage. The next logical step is to extend existing programs and philosophies to the water.

Management Recommendations

These recommendations are presented only for those islands that the SCRU has had an opportunity to visit. They conclude with a general recommendation for the islands of Micronesia.

Saipan

More than 40 documented ship losses have occurred in and around Saipan; to date only a handful of sites has been investigated. Prominent among those is the earliest known site, that of the Manila galleon NUESTRA SENORA de la CONCEPCION, wrecked in 1638. The site was excavated by a treasure salvage company under an agreement with the CNMI Historic Preservation Office. According to a superficial treatment in National Geographic (September 1990:39-52), the principal investigators are a marine construction manager and a marine biologist.

As a result of this sanctioned salvage operation, Saipan will get a percentage of the artifacts. The remainder will be sold off to the highest bidders and scattered throughout the world. The decision to enter into a salvage agreement for

such an important historic resource does not comply with accepted guidelines for responsible resource management. The loss here is more than the artifacts to the people of the Mariana Islands, the Philippines, Spain and Mexico. All nations involved in the Acapulco-Manila trade lose when ships are salvaged for the personal or corporate benefit of a few.

The recommended alternative to this decision would have been to retain public ownership of this piece of cultural heritage, and excavate it with qualified archeologists. If Saipan had chosen to build a "working" museum where visitors could see the conserved artifacts displayed and have the opportunity to observe archeologists and conservators at work, it would have attracted visitors to the island well into the future. The dollars tourists spend reach into every segment of a community, and in an area that needs economic growth, tourism is extremely important. The dollars that the tourists coming to the museum would have spent over the next 20, 40, 60 or 100 years would have paid for the costs of a museum, staff, qualified archeologists and conservators many times over.

Continued inventory of the remaining offshore areas of the island could still provide interpretive benefits to visitors and enhance the ability of the historic preservation office to manage these sites.

Rota

While preliminary documentation exists of the World War II ships SHOUN MARU and CHA 54, 56 and an unidentified chaser, there has not been a systematic survey of the offshore areas of the island, nor have the submerged caves been evaluated for prehistoric sites. Mapping of SHOUN MARU, to the same level as the sites in Belau, could provide some interpretive benefits but, by and large, efforts should focus on survey and examination of the caves.

Guam

The more than 60 documented shipwrecks in and around Guam span a period of more than four centuries. Remote-sensing surveys have been conducted in Apra Harbor, and mapping of three of the six major shipwreck sites has been completed. NICHIIYU MARU, CS SCOTIA and SS CARIBA should be considered for the same level of mapping documentation that has been afforded KIZUGAWA, TOKAI and CORMORAN. Should a remote-sensing survey be considered in the future, the focus of those searches should be the earliest shipwreck sites at the island. These sites, although not necessarily the most significant, tend to be the most threatened by the actions of salvors (refer to Saipan, above). Recent decisions by the

Guam courts have only minimally limited this potential. However, GovGuam should make an effort to bring these important sites under management control by determining their locations and actively preventing inadvertent impacts as a result of other activities.

Republic of Belau

Some limited follow-up work should be conducted on RAIKAN MARU; this site was only briefly examined and it should be documented. In addition, examination of all of the other remaining shipwrecks, including the Buoy 7 wreck in the main channel and the site locally referred to as ASASHIO MARU, should be conducted to round out the inventory of presently known sites. These examinations should be done under the supervision of an underwater archeologist with knowledge of World War II ships. If funding becomes available, additional remote-sensing surveys in the main channels and south of Ngeruktable Anchorage may be warranted. Help of local volunteer divers who will operate within a no-impact framework should be encouraged.

Finally, every effort should be made to locate the most significant shipwreck on Belau, the East India Company ship ANTELOPE. This can only be accomplished using remote-sensing equipment.

Future work should be organized to limit the numbers of divers and maximize field supervisory and documentation training for the Division of Cultural Affairs staff.

State of Kosrae (FSM)

In 1988, the missionary ship, MORNING STAR, was reported to have been discovered in one of Kosrae's harbors. This ship played a significant role in the history of the island. If the ship has been located, every effort should be made to complete preliminary documentation and, if at all feasible, complete mapping. Similarly, any ships related to whaling activities in the area should be investigated. Subsurface testing of the LEONORA site should be carried out.

State of Truk (FSM)

There are many reports of laxity in the "guide system" with many artifacts still being removed from the ships. Obviously, this activity should be stopped before the attraction of the sites to divers is severely compromised.

Truk seems to have an active program in place to evaluate the resource base and to reevaluate resources management philosophy. These efforts should continue.

Bikini

Continued documentation and evaluation should be undertaken in Bikini. These sites have the potential for being the focus of a marine park or nuclear theme park interpretive program that would attract tourism should the Bikinians choose to reinhabit their island.

Conclusions

The vast shipwreck and nonshipwreck resources of the islands have been underinvestigated, and their potential for increasing tourism and helping the economies of the various islands underrated. Should the islands choose to inventory submerged resources, they should do so with an eye toward their preservation and long-term protection, perhaps through the establishment of state or federation national parks. Even if no preserves or parks are created, the islands should establish clear ownership of and control over their underwater resources. Legislation should seek to guarantee a "look but don't take" philosophy. If divers are permitted to remove artifacts from sites, piece by piece the resources will disappear and with them the potential for long-term economic benefit to the islands.

It is recommended that the various historic preservation offices in Micronesia pool resources to create a standing team of underwater survey and preservation experts who could be called in to work on projects on each island as needed. From the experience we gained in conducting the submerged cultural resources training session in Guam in 1987, it was clear that the talent and the interest for such a cadre is present.

Submerged sites should be interpreted to the diving and nondiving public to create a broad base of visitation. One of the best ways to accomplish this is through the establishment of natural and cultural museums. These facilities can interpret the nonshipwreck sites as well. Museums help to increase tourism by encouraging visitors to come to an island initially or to increase their stay. Islands in the Caribbean have found the establishment of museums to be one of the most effective means of increasing the nonconsumptive industry of tourism, which directly benefits the local economy and the people.

Finally, who will preserve the submerged cultural resources of Micronesia? If those charged with resources management allow individuals to excavate sites for a split of the

artifacts, then who benefits? It is easy to be lured by the possibility of a quick return with little or no investment--clearly a deal too good to be true. Archeology, unlike many other endeavors, has the potential to preserve a bit of our history and bring it alive today and for the future. Underwater sites should be excavated to the same standards, and with the same highly qualified professionals, as sites on land. Other countries are recognizing the value of keeping their cultural resources out of the hands of treasure hunters. As those engaged in harvesting artifacts from historic sites for sale are being forced from the Caribbean, the United States and European nations, the South Pacific becomes a target. By learning from the mistakes of others, we all can preserve the most ephemeral bit of ourselves, our history.

BIBLIOGRAPHY

- Agawa, Hiroyuki (trans. by John Bester)
1979 The Reluctant Admiral: Yamamoto and the Imperial Navy. Kodansha International Ltd., Tokyo, Japan.
- Alden, John D.
1989 U.S. Submarine Attacks During World War II (Including Allied Submarine Attacks in the Pacific Theater). Naval Institute Press, Annapolis.
- Annual Report of the Governor (ARG)
1903-17 Annual Reports of the Governor. Pacific Collection at Micronesian Area Research (MARC), University of Guam.
- Ashby, Gene
1983 A Guide to Ponape, An Island Argosy. Rainy Day Press, Eugene, Oregon and Ponape, FSM.
- Ayers, William S.
1990 Mystery Islets of Micronesia. In Archaeology 43(1):59-63. Archaeological Institute of America, New York.
- Bailey, Dan
1982 WW II Wrecks of the Kwajalein and Truk Lagoons. North Valley Diver Publications, Redding.
- 1986 Palau Wreck Divers Map. North Valley Diver Publications, Redding.
- Barker, A. J., with Ronald Heiferman, Ian V. Hogo, John Grayson Kirk, William J. Koenig and Antony Preston
1984 The Rise and Fall of Imperial Japan. Bison Books Ltd., Greenwich.
- Barratt, G. (translator and editor)
1984 Russian Explorations in the Mariana Islands 1817-1828. Micronesian Archaeological Survey Report No. 17. Saipan.
- 1988 Carolinean Contacts with the Islands of the Marianas: The European Record. Micronesian Archaeological Survey Report No. 25. Saipan.

- Beesley, Patrick
1981 Very Special Intelligence. Ballantine Books, New York.
- Bennett, J. A.
1976 Immigration, Blackbirding Labour Recruiting? The Hawaiian Experience 1877-1887. Journal of Pacific History, XI(1):3-27.
- Belote, James and William Belote
1970 Typhoon of Steel: The Battle for Okinawa. Bantam Books, New York.
- Bertrand, Kenneth J.
1967 Geographical Exploration by the United States. In The Pacific Basin, A History of Its Geographical Exploration. Herman R. Friss, editor, pp. 256-291. American Geographical Society, New York.
- Blair, Clay
1975 Silent Victory, 2 vols. J. B. Lippincott Co., New York.
- Blair, Emma H. and James Alexander Robertson (editors)
1903-09 The Philippine Islands: 1493-1898, 55 vols, Vols. 9, 10, 29. A. H. Clark, Cleveland.
- Boxer, C. R.
1985 Portuguese Conquest and Commerce in Southern Asia, 1500-1750. Valorum Reprints, London.
- Braisted, William Reynolds
1971 The U.S. Navy in the Pacific, 1909-1922. University of Texas Press, Austin.
- Brever, William B.
1987 Devil Boats: The PT War Against Japan. Presidio Press, Novato.
- Bridges, G.A.
1870 Log of the Schooner Malolo, 1868-1870. Microfilm copy on PMB Nos. 219, 220. Peabody Museum, Salem.
- Broek, Jan O. M.
1967 Geographical Exploration by the Dutch. In The Pacific Basin, A History of Its Geographical Exploration. Herman R. Friss, editor, pp. 151-169. American Geographical Society, New York.
- Brown, Richard G.
1977 The German Acquisition of the Caroline Islands 1898-99. In Germany in the Pacific and Far East,

1870-1914, John A. Moses and Paul M. Kennedy, editors, pp. 137-155. University of Queensland Press, Queensland.

Burdick, Charles
1979 The Frustrated Raider. Southern Illinois University Press, Carbondale, pp. 119.

Burney, James
1817 A Chronological History of Voyages and Discoveries in the South Seas, 7 volumes. Luke Hansard & Sons, London. Reprinted 1967, Da Capo Press, New York.

Butowsky, Harry A.
1985 Warships Associated with World War II in the Pacific (National Historic Landmark Theme Study). U.S. Government Printing Office, Washington D.C.

Carano, Paul and Pedro Sanchez
1964 A Complete History of Guam, Charles E. Tuttle, Inc., Vermont.

Carpenter, Corr and Norman Polmar
1986 Submarines of the Imperial Japanese Navy. Naval Institute Press, Annapolis.

Carrell, Toni
1985 Trip Report Covering Activities at War in the Pacific National Historical Park, American Memorial Park and USS Arizona Memorial, March 14-April 10, 1985. On file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.

CDI - Coleccion de documentos ineditos relativos al descubrimiento, conquista y organizacion de las antiguas posesiones espanolas de Ultramar

1186 De Las Islas Filipinas, 2nd Series, Vol. 2, Part 1. Sucesores de Rivadeneyra, Madrid.

Chapman, Peter
1968 Japanese contributions to Micronesian archaeology and material culture. In Prehistoric Cultural in Oceania, edited by Ichiro Yuata and Y.H. Sinto, pp. 67-82. Bishop Museum Press, Honolulu.

Chesnau, Roger
1984 Aircraft Carriers of the World, 1914 to the Present: An Illustrated Encyclopedia. Naval Institute Press, Annapolis.

- Chesnau, Roger and E. M. Kolesnik (editors)
 1979 Conway's All the Worlds Fighting Ships, 1860-1905,
 Vol. 1. Conway Maritime Press, London.
- 1980 Conway's All the Worlds Fighting Ships, 1922-1946,
 Vol. 2. Conway Maritime Press, London.
- 1985 Conway's All the Worlds Fighting Ships, 1906-1921,
 Vol. 3. Conway Maritime Press, London.
- Clyde, Paul H.
 1935 Japan's Pacific Mandate. MacMillan Co., New York.
- Coello, Francisco
 1985 La Conferencia de Berlin y la Cuestion de las
Carolinas. Madrid.
- Cohen, Stan
 1983 Destination" Tokyo - a Pictorial History of
Doolittle's Tokyo Raid, April 18, 1942. Pictorial
 Histories Publishing Company, Missoula.
- 1981 East Wind Rain: A Pictorial History of the Pearl
Harbor Attack. Pictorial Publishing Company,
 Missoula.
- Colcord, Mrs. Andrew
 1875 Journal Aboard the Missionary Packet Morning Star
on Voyage to Micronesia - 1875. Microfilm copy on
 PMB No. 290. Old Dartmouth Historical Society and
 Whaling Museum, New Bedford.
- Colin, Francisco
Labor Evangelica, ministerios apostolicos de los
obreros de la Compania de Jesus, fundacion de su
provincia en las Islas Filipinas. Pablo Pasells,
 ed. 3 vols. Barcelona, 1900.
- Compton-Hall, Commander Richard
 1982 The Underwater War 1939-1945. Blanford Press,
 Poole, Dorset.
- Cooper, William
 1991 Personal communications.
- Corey, Victoria
 1968 Chronology of Ships Visitng Guam, 1521-1898. Agana,
 Guam, 1968, rev. 1971. 124 pp. typescript.
 Manuscript on file Micronesian Area Research
 Center, University of Guam, Mangilao.
- Anson, W. V. The Life of Admiral Lord Anson.

- Beaglehole, J. C. The Exploration of the Pacific.
- Bradley, W. P. The History of the Marianas, Caroline, Pelew and Marshall Islands to the Year 1922.
- Buck, P. H. Explorers of the Pacific.
- Burney, J. A Chronological History of the Voyages and Discoveries in the South Seas.
- History of the Buccaneers of America.
- Careri, G. F. G. Voyage to the Philippines.
- Corte, F. R. C. Trans. G. Hornbostel. A History of the Mariana Islands.
- Costa, H. The Jesuits in the Philippines, 1581-1768.
- Cox, L. M. The Island of Guam.
- Dalrymple, A. A Historical Collection of the Several Voyages and Discoveries in the South Pacific Ocean.
- Dampier, W. A New Voyage Around the World.
Dampier's Voyages.
- Dewar, J. C. Voyage of the Nyanza.
- Dunmore, J. French Explorers in the Pacific.
- Garcia, F. Trans. M. Higgins. The Life and Martyrdom of the Venerable Father Diego Luis de Sanvitores.
- LeGobien, C. Trans. P. V. Daly. History of the Mariana Islands.
- Hawkesworth, J. An Account of the Voyages.....
- Le Gentil de la Galaisiere, G. J. A Voyage into the Indian Seas.
- Lubbock, B. Bully Hayes, South Sea Pirate.
- Napole, V. Journal.
- Oliver, D. L. The Pacific Islands.
- Pancaldo, L. Journal.

- Pigafetta, A. Journal.
- Safford, W. E. Useful Plants of the Island of Guam.
 _____ "Notebook. 'The Mariana Islands.'" MS.
- Searles, P. S. A School History of Guam.
- Sharp, A. Discovery of the Pacific Islands.
- Sullivan, J. The Phoenix Rises.
- Walter, R. Voyage Round the World.
- Ward, R. G. American Activities in the Central Pacific, 1790-1870.
- Zuniga, J. J. An Historical View of the Philippine Islands.
- Corte, F. de la
 1875 Memoria descriptiva e historica de las islas Marianas y otras que las rodean en relacion con ellas y de su organizacion actual, con estudio analitico de todos sus elementos fisicos, morales y politicos, y propuesta de su reforma en todos los ramos para elevarlas al grado de prosperidad que les corresponde. Imprenta Nacional, Madrid.
- Costello, John
 1981 The Pacific War 1941-1945. Atlantic Communications, Inc., New York.
- Costello, John and Terry Hughes
 1976 Jutland 1916. Holt, Rinehart and Winston, New York.
- Costenoble, Herman H.L.W.
 1905 Die Marianen. Globus v. 88. Translation by S. Wilkins, Micronesian Area Research Center (MARC) Working Paper No. 33, Micronesian Area Research Center, University of Guam.
- Coulter, John W.
 1957 The Pacific Dependencies of the United States. MacMillan Company, New York.
- Crowl, Philip A.
 1980 Campaign in Marianas. Department of the Army, Washington, D.C.

- Cushner, Nicholas P.
1971 Spain in the Philippines. IPC Monographs, No. 1.
Ateneo de Manila & Tuttle Press, Manila.
- Dahlgren, Erik W.
1917 Were the Hawaiian Islands visited by the Spaniards before their Discovery by Captain Cook in 1778? A Contribution to the Geographical History of the North Pacific Ocean, especially of the Relations between America and Asia in the Spanish Period. Stockholm.
- 1917 The Discovery of the Hawaiian Islands. Almquist, Wiksells, reprinted 1977 by AMS Press Inc, New York.
- Delgado, James P., Daniel J. Lenihan and Larry Murphy
In Press The Archeology of the Atomic Bomb: A Submerged Cultural Resources Assessment of the Sunken Fleet of Operation Crossroads at Bikini and Kwajalein Atoll Lagoons, Republic of the Marshall Islands, Southwest Cultural Resources Center Professional Papers No. 37, National Park Service, Santa Fe.
- Department of the Army
1947 Japanese Naval and Merchant Shipping Losses During World War II By All Causes. Navy Joint Assessment Committee. U.S. Government Printing Office, Washington, D.C.
- Department of the Navy
1898a Seizure of the Ladrone Islands no. 108414, p. 151. Appendix to the Report of the Chief of the Bureau of Navigation, U.S. Government Printing Office, Washington, D.C.
- 1898b Miscellaneous Operations no. 144988, p. 137-38. Appendix to the Report of the Chief of the Bureau of Navigation, U.S. Government Printing Office, Washington, D.C.
- 1898c Information Concerning Guam. National Archives Record Group 80, no. 9351:1-9.
- 1942 Japanese Merchant Ship Recognition Manual - ONI-208J (OP-16-F-20). Office of Naval Intelligence, Washington D.C.
- 1943 Military Government Handbook, Marshall Islands, OPNAV 50E-1. Office of the Chief of Naval Operations, Washington, D.C.

- 1944 Civil Affairs Handbook Mandated Marianas, OPNAV 50 E-8. Office of the Chief of Naval Operations, Washington.
- 1944 Civil Affairs Handbook, West Caroline Islands, OPNAV 50E-7. Office of the Chief of Naval Operations, Washington.
- 1944 Civil Affairs Handbook, East Caroline Islands, OPNAV 50E-5. Office of the Chief of Naval Operations, Washington, D.C.
- 1944 ONI 223-M Merchant Ship Shapes. Office of the Chief of Naval Operations, Office of Naval Intelligence. U.S. Government Printing Office, Washington.
- 1945 U.S. Submarine Attacks. Submarine Operations Research Group. Commander Submarines Pacific, Pearl Harbor.
- 1945 ONI-222-J, The Japanese Navy. Office of Naval Intelligence, Washington D.C.
- 1947 Japanese Naval and Merchant Shipping Losses During World War II By All Causes. Joint Army-Navy Assessment Committee. U.S. Government Printing Office, Washington D.C.
- Doran, Edwin Jr.
1981 WANGKA Austronesian Canoe Origins, Texas A&M University Press.
- Driver, M. G.
1976 Translator and editor. Chronicle of the Mariana Islands by Aniceto Ibañez del Carmen, Francisco Resano, and others. Publications No. 5, Micronesian Area Research Center, Guam.
- 1977 Translator. The Account of a Discalced Friar's Stay in the Islands of the Ladrones. Historia de las islas del archipiélago Filipino y reinos de las China, Tartaria, Cochín-china, Malaca, Siam, Cambodge y Pajon, Chapter 19 by Marcelo Ribadeneira. Guam Recorder n.s. 7 (1977):19-21.
- 1983 "Fray Juan Pobre de Zamora and his Account of the Mariana Islands." Journal of Pacific History, V.18.
- 1985 Guam: A Nomenclatural Chronology. Micronesian Area Research Center. Mangilao.

- 1987 Translator and editor. Navigational Data for the Mariana Islands by Spanish Hydrographic Office, 1862. Educational Series No. 6, Micronesian Area Research Center, Guam.
- 1988 Cross, Sword and Silver. The Nascent Spanish Colony in the Mariana Islands. Pacific Studies, P 11, no. 3, July 21-51.
- Du Pasquier, Thierry
1982 Les baleiniers francais a XIXe siecle (1814-1868). Grenoble, Terre et Mer/4 Seigneurs, 256 pp.
- Dulin, Robert O., Jr. and William H. Garzke, Jr.
1976 Battleships: United States Battleships in World War II. Naval Institute Press, Annapolis.
- Dull, Paul S.
1978 A Battle History of the Imperial Japanese Navy (1941-1945). Naval Institute Press, Annapolis.
- Dumont d'Urville, Jules
1843 Voyage au Pole Sud et dans l'Oceanie sur les corvettes l'Astrolabe et la Zelee execute par ordre du roi pendant les anees 1837, 1838, 1839, 1840. Part 1: Histoire du voyage, vol 5. Gide, Paris.
- Evans, David C. (editor)
1986 The Japanese Navy in World War II in the Words of Former Japanese Naval Officers. Naval Institute Press, Annapolis.
- Ewing, Steve
1987 American Cruisers of World War II - a Pictorial Encyclopedia. Pictorial Histories Publishing Company, Missoula.
- Fernandez Duro, Cesareo
1972-73 La Armada espanola desde la union de los reinos de Castilla ye de Aragon, 9 vols. Museo Naval. Madrid.
- Fernandez de Navarrete, Martin
1837 Coleccion de los viages y descubrimientos que hicieron por mar los espanoles. Madrid. Reprint Krau-Thompson, Nendeln, 1971.
- Firth, Stewart G.
1977 German Firms in the Pacific Islands, 1857-1914. In Germany in the Pacific and Far East, 1870-1914.

John A. Moses and Paul M. Kennedy, editors, pp. 3-25. University of Queensland Press, St. Lucia.

Fischer, George A.

1898 Diary. Spanish American War Survey, Archives of Carlisle Barracks, Carlisle.

Francillon, Rene J.

1970 Japanese Aircraft of the Pacific War. Naval Institute Press, Annapolis.

Friedman, Norman

1985 U.S. Battleships - An Illustrated Design History. Naval Institute Press, Annapolis.

1984 U.S. Cruisers - An Illustrated Design History. Naval Institute Press, Annapolis.

Friss, Herman R. (editor)

1967 The Pacific Basin, A History of its Geographical Exploration. American Geographical Society, New York.

Fritz, Georg

1906 Von den Marianen. Globus v. 89. Translation by S. Wilkins, Micronesian Area Research Center (MARC) Working Paper No. 30, Micronesian Area Research Center, University of Guam.

Fuchida, Mitsuo and Masatake Okumiya (Edited by Clarke H. Kawakami and Roger Pineau)

1955 Midway - The Battle That Doomed Japan. Ballantine Books, Inc., New York.

Gailey, Harry A.

1983 Peleliu 1944. The Nautical and Aviation Publishing Company of America, Annapolis.

Galatin, Admiral I. J.

1987 Take Her Deep! A Submarine Against Japan in World War II. Algonquin Books of Chapel Hill, Chapel Hill.

Garfield, Brian

1969 The Thousand-Mile War: World War II in Alaska and the Aleutians. Bantam Books, Inc., New York.

Garry, Robert J.

1967 Geographical Exploration by the French. In The Pacific Basin, A History of Its Geographical Exploration. Herman R. Friss, editor, pp. 201-220. American Geographical Society, New York.

- Glines, Caroll V.
 1988 The Doolittle Raid: America's Daring First Strike Against Japan. Orion Books, Inc., New York.
- Goodenough, James G.
 1875 Proceedings of HMS Rosario in the South Sea Islands: Criminal Acts of Mr. W. H. Hayes, Master of the Brig Leonora. Queensland Government Gazette 17:1671-1678. St. Lucia.
- Gschaedler, Andre
 1954 Mexico and the Pacific, 1540-1565. Ph.D. thesis, Columbia University.
- Gummerman, George, David Snyder and W. Bruce Masse
 1981 An Archaeological Reconnaissance in the Palau Archipelago, Western Caroline Islands, Micronesia. Southern Illinois University Center for Archaeological Investigations Research Paper No. 23.
- Guzman-Rivas, Pablo
 1960 "Reciprocal Geographic Influences of the Trans-Pacific Galleon Trade." The University of Texas, Ph.D.
- Haddon, A.C. and James Hornell
 1975 Canoes of Oceania, Bishop Museum Press (reprint of three volumes originally published 1936, 1937 and 1938).
- Hager, Carl
 1886 Die Marshall-Inseln in Erd- und Volkerkunde, Handel und Mission. G. Lingke, Leipzig.
- Halsey, Fleet Admiral William F. and J. Bryan III
 1947 Admiral Halsey's Story. Zenger Publishing Company, Washington D.C.
- Hamilton, John
 1986 War at Sea, 1939-1945. Blanford Press, Pool, Dorset.
- Hammel, Eric
 1988 Guadalcanal - Decision at Sea. Crown Publishers, Inc., New York.
- Hara, Captain Tameichi with Fred Saito and Roger Pineau
 1961 Japanese Destroyer Captain. Ballantine Books, Inc., New York.

- Harman, Charles H. S.
 1898 Dairy. Spanish American War Survey, Archives of Carlisle Barracks, Carlisle.
- Haswell, W.
 1917 Remarks on a Voyage in 1801 to the Island of Guam. Salem: Peabody Museum (reprint). Historical Collections of the Essex Institute. 3:193-214
- Hempenstall, Peter J.
 1977 Native Resistance and German Control Policy in the Pacific: the Case of Samoa and Ponape. In Germany in the Pacific and Far East, 1870-1914, John A. Moses and Paul M. Kennedy, editors, pp. 209-233. University of Queensland Press, Queensland.
- Hezel, Fr. Francis X., SJ
 1979 Foreign Ships in Micronesia. Trust Territory Historic Preservation Office and U.S. Heritage Conservation and Recreation Service. Saipan.
- 1983 The First Taint of Civilization: A History of the Caroline and Marshall Islands in Pre-Colonial Days, 1521-1885. Pacific Islands Monograph Series No. 1. University of Hawaii Press, Honolulu.
- Hocking, Charles
 1969 Dictionary of Disasters at Sea During the Age of Steam Including Sailing Ships and Ships Lost in Action 1824-1962, 2 vols. Lloyds Register of Shipping, Crawby, Sussex.
- Holmes, W. J.
 1981 Dougle-Edges Secrets: U.S. Naval Intelligence Operations in the Pacific During World War II. Berkley Books, Inc., New York.
- Hough, Richard
 1964 Dreadnought: A History of the Modern Battleship. The MacMillan Company, New York.
- 1983 The Great War at Sea 1914-1918. Oxford University Press, Oxford, New York.
- 1986 The Longest Battle: The War at Sea 1939-1945. William Morrow and Company, Inc., New York.
- Hoyt, Edwin P.
 1972 The Battle of Leyte Gulf. Jove Books, New York.
- 1972 Guadalcanal. Jove Books, New York.

- 1975 Blue Skies and Blood - The Battle of the Coral Sea.
Jove Books, New York.
- 1976 The Lonely Ships: The Life and Death of the U.S. Asiatic Fleet. David McKay Company, Inc., New York.
- 1978 Storm Over the Gilberts - War In the Central Pacific: 1943. Avon Books, Inc., New York.
- 1980 To the Marianas - War in the Central Pacific: 1944. Van Nostrand-Reinhold Company, New York.
- 1981 Pacific Destiny. W. W. Norton and Company, Inc., New York.
- 1982 Closing the Circle - War in the Pacific: 1945. Avon Books, Inc., New York.
- 1983 Bowfin. Van Nostrand Reinhold Company, New York.
- 1983 McCampbell's Heroes. Avon Books, Inc., New York.
- 1986 Japan's War: The Great Pacific Conflict 1853-1952. McGraw-Hill Book Company, Inc., New York.
- 1987 The Carrier War. Avon Books, New York.
- Humble Richard
1982 Aircraft Carriers - The Illustrated History. Chartwell Books, Inc., Seacaucas.
- 1984 United States Fleet Carriers of World War II 'In Action'. Blanford Press, Poole, Dorset.
- Ibanez del Carmen, Aniceto, Fransico Resano et. al
1976 Chronicle of the Mariana Islands. Translated by Marjorie G. Driver. University of Guam, Micronesian Area Research Center, Agana.
- Ibanez y Garcia, Luis
1886 Historia de las Islas Marianas, Carolinas y Palaos. Granada. Paulino V. Sabatel.
- Imperial Japanese Navy
1952 Imperial Japanese Navy in World War II. Far East Command. History Section, Special Staff, Tokyo.
- 1952 Imperial Japanese Navy in World War II. Japanese Monogram No. 46. History Section, Special Staff, Tokyo.

- Ito, Masanori with Roger Pineau (translated by Andrew Y. Kuroda and Roger Pineau)
 1984 The End of the Imperial Japanese Navy. Jove Books, Inc., New York.
- Jenks, Carole
 1970 Nan Madol. Ponape District Development Office, Kolonia.
- Jentschura, Hansgeorg with Dieter Jung and Peter Mickel (translated by Antony Preston and J. D. Brown)
 1977 Warships of the Imperial Japanese Navy, 1869-1945. Naval Institute Press, Annapolis.
- Johnson, Frank D.
 1980 United States PT Boats of World War II in Action. Blanford Press, Poole, Dorset.
- Johnston, Stanley
 1979 Queen of the Flattops: The U.S.S. Lexington and the Coral Sea Battle. Bantam Books, New York.
- Joint Army-Navy Assessment Committee
 1947 Japanese Naval and Merchant Shipping Losses During World War II by All Causes. (Familiarly known as the Janac Report) U.S. Government Printing Office, Washington D.C.
- Karig, Captain Walter and Commander Eric Purdon
 1947 Battle Report - Pacific War: Middle Phase. Reinhart and Company, Inc., New York.
- Keate, George
 1788 An Account of the Pelew Islands. G. Nichol Pall Mall, London.
- Keith, Donald H.
 1987 The Molasses Reef Wreck. Ph.D. Dissertation, Department of Geography, Texas A & M University. University Microfilms, Ann Arbor.
- Kelly, Roger
 1988 Are Submerged Heritage Resources Protected in Pacific Rim Nations? Proceedings of the Society for Historical Archeology.
- Klingman, Lawrence and Gerald Green
 1950 His Majesty O'Keefe. Charles Scribner's Sons, New York.

- Knight, Martin P.
 1977 Britain, Germany and the Pacific, 1880-87. In Germany in the Pacific and Far East, 1870-1914, John A. Moses and Paul M. Kennedy, editors, pp. 61-88. University of Queensland Press, Queensland.
- Knott, Richard C.
 1981 Black Cat Raiders of World War II. The Nautical and Aviation Publishing Company of America, Baltimore.
- LaCroix, Louis
 1947 Les derniers baleiniers francais. Un demisiecle d'histoire de la grande peche baleiniere en France de 1817 a 1867. Nantes, Aux Portes du Large, 373 pp.
- Layton, Rear Admiral Edwin T.
 1980 "And I Was There". William Morrow and Company, Inc., New York.
- Lebedev, Dimitri M. and Vadim I. Grekov
 1967 Geographical Exploration by the Russians. In The Pacific Basin, A History of Its Geographical Exploration. Herman R. Friss, editor, pp. 170-200. American Geographical Society, New York.
- Lee, Robert Edward
 1981 Victory at Guadalcanal. Zebra Books, Kensington Publishing Corporation, New York.
- Lendemann, Klaus P.
 1982 Hailstorm Over Truk Lagoon. Maruzen Investment, Hong Kong.
- Lenihan, Daniel J.
 1988 Trip Report Covering Activities in the Republic of Palau, April 11 through June 27, 1988. Unpublished report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.
- Lenihan, Daniel J., Toni Carrell and Larry Murphy
 1981 The Utwa Harbor Wreck Site: A Shipwreck Evaluation and Management Report. Report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe, was published in its entirety in Of Wooden Ships and Iron Men: An Historical and Archaeological Survey of the Brig Leonora, see Russell 1982 entry in this bibliography.

- Lessa, William A.
 1975 Drake's Island of Thieves: Ethnological Sleuthing. The University of Hawaii Press, Honolulu.
- Lesson, Rene-Primevere
 1838 Voyage autour du monde entrepris par ordre du gouvernement sur las corvette la Coquille, Vol. 1. Pourrat, Paris.
- 1839 Voyage autour du monde entrepris par ordre du gouvernement sur las corvette la Coquille, Vol. 2. Pourrat, Paris.
- Lewin, Ronald
 1978 Ultra Goes to War. Pocket Books, Inc., New York.
- 1983 The American Magic. Penguin Books, Inc., New York.
- Leyland, John (editor)
 1900 The Naval Annual: 1900. J. Griffan and Company, Portsmouth.
- Lindemann, Klaus
 1988 Desecrate 1: The Shipwrecks of Palau. Pacific Press Publications, Belleville.
- Lockwood, Vice Admiral Charles A.
 1951 Sink 'Em All. Bantam Books, New York.
- Lodge, Major O.R.
 1954 The Recapture of Guam. U.S. Marine Corps, Washington, D.C.
- Longden, Charles E.
 1898 Diary. Spanish American War Survey, Archives of Carlisle Barracks, Carlisle.
- Lord, Walter
 1977 Lonely Vigil: Coastwatchers of the Solomons. The Viking Press, New York.
- Lotz, David T.
 1986 "The Silent Service." Islander Pacific Daily News, Agana, March 23, 1986.
- 1988 "Roaming the Skies." Islander, Pacific Daily News, Agana, June 19, 1988.

- Lowder, Hughston E. with Jack Scott
 1980 Batfish: The Champion "Submarine Killer" Submarine of World War II. Prentice-Hall, Inc., Englewood Cliffs.
- Lowder, Haughston E.
 1987 The Silent Service. Silent Service Books, Baltimore.
- Lundstrom, John B.
 1984 The First Team: Pacific Naval Air Combat From Pearl Harbor to Midway. Naval Institute Press, Annapolis.
- Lutke, Frederic
 1835 Voyage autour du monde, exectue par ordre de Sa Majeste l'empereur Nicolas Ier, sur la corvette le Seniavine, dans les annees 1826, 1827, et 1829. Part 2: Partie Historique, 2 vols. Firmin Didot, Paris. Reprinted 1971. Bibliotheca Australiana nos. 58, 59. Da Capo, New York.
- MaClay, Edgar Stanton
 1898 A History of the United States Navy from 1775 to 1898, 2 vols. D. Appleton and Company, New York.
- Manchester, William
 1978 American Caesar: Douglas MacArthur, 1880-1969. Dell Publishing Company, Inc., New York.
- Manibusan, Rose S.N. and James E. Miculka
 1983 Submerged Cultural Assessment: American Memorial Park II, December. Unpublished report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.
- Martin, Kenneth R. (editor)
 1980 Naked and a Prisoner: Captain Edward C. Barnard's Narrative of Shipwreck in Palau 1832-1833. The Kendall Whaling Museum, Sharon.
- McGuiness, John
 1882 Testimony regarding charges against O'Keefe and others trading in the Caroline Islands, August 5, 1882. WPHC Secretariat 1875-1914, 152/82. Central Archives of Fiji, Suva.
- Messimer, Dwight R.
 1983 Pawns of War: The Loss of the U.S.S. Langley and U.S.S. Pecos. Naval Institute Press, Annapolis.

- 1985 In the Hands of Fate: The Story of Patrol Wing 10, 8 December 1941 - 11 May 1942. Naval Institute Press, Annapolis.
- Miculka, James E.
1983 Submerged Cultural Resources Assessment: War In the Pacific National Historical Park. Unpublished report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.
- Miculka, James E. and Rose S.N. Manibusan
1983 Submerged Cultural Assessment: American Memorial Park I, October. Unpublished report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.
- Miculka, James E., Kevin J. Carter, Nobuo Ichihara, Jimmy Garrido and Suzanne Hendricks
1984 Submerged Cultural Resources Assessment: Saipan Lagoon, December 3-5, 1984. Unpublished report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.
- Miculka, James E., Edward Wood, William Cooper and Dennis Blackenbaker
1990 Submerged Cultural Resources Assessment: Saipan. Unpublished report on file, National Park Service, Submerged Cultural Resources Unit, Santa Fe.
- Miller, Nathan
1980 The Naval Air War 1939-1945. The Nautical and Aviation Publishing Company of America, Annapolis.
- Miller, Thomas G., Jr.
1981 The Cactus Air Force. Bantam Books, Inc., New York.
- Mitchell, Donald W.
1946 History of the Modern American Navy From 1883 Through Pearl Harbor. Alfred A. Knopf and Company, New York.
- Molina, Antonio
1984 Historia de Filipinas. 2 vols. Ediciones Cultura Hispanica del Instituto de Cooperacion Iberoamericana. Madrid.
- Mondey, David
1984 Concise Guide to Axis Aircraft of World War II. Temple Press, Middlesex England.

- Moore, Lewis J.
1872 Report of Proceedings of HMSW Barrosa, July 25, 1872. China Letter No. 2216, enclosure no. 1. Public Record Office, London.
- Morison, Samuel Eliot
1984 History of United States Naval Operations in World War II: Volume III - The Rising Sun in the Pacific, 1931 - April 1942. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume IV - Coral Sea, Midway and Submarine Action, May 1942 - August 1942. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume V - The Struggle for Guadalcanal, August 1942 - February 1943. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume VI - Breaking the Bismarcks Barrier, 22 July 1942 - 1 May 1944. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume VII - Aleutians, Gilberts and Marshalls, June 1942 - April 1944. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume VIII - New Guinea and the Marianas, March 1944 - August 1944. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume XII - Leyte, June 1944 - January 1945. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume XIII - Liberation of the Philippines: Luzon, Mindanao, the Visayas, 1944-1945. Little, Brown and Company, Boston.
- 1984 History of United States Naval Operations in World War II: Volume XIV - Victory in the Pacific, 1945. Little, Brown and Company, Boston.
- Morrison, Wilbur H.
1986 Above and Beyond: 1941-1945. Bantam Books, Inc., New York.

- Morton, Henry
1975 The Wind Commands, Sailors and Sailing Ships in the Pacific. Wesleyan University Press, Middletown and University of British Columbia Press; Vancouver.
- Motteler, Lee S.
1986 Pacific Island Names. Bishop Museum Press, Honolulu.
- Murillo Velarde, Pedro
1749 Historia de la provincia de Philipinas de la Compania de Jesus. Manila, Book 4.
- Naval History Division
1969, Dictionary of American Naval Ships. Vols. 2, 5,
1970 and 6. Navy Department, Washington, D.C.
1976
- Naval Institute Press
1987 Japanese Naval Vessels of WW II, As Seen by U.S. Naval Intelligence (A compendium of contemporary U.S. Naval Intelligence Manuals, with introduction by A. D. Baker, III). Naval Institute Press, Annapolis.
- Noone, Martin J.
1986 General History of the Philippines. Part 1, Vol. I. "The Discovery and Conquest of the Philippines: 1521-1581." Manila. Historical Conservation Society, XLIII.
- Nozikov, Nikolai N.
1946 Russian Voyages Round the World. Hutchinson, London.
- O'Kane, Rear Admiral Richard H.
1981 Clear the Bridge! The War Patrols of the U.S.S. Tang. Bantam Books, New York.
- 1987 Wahoo: The Patrols of America's Most Famous World War II Submarine. Presidio Press, Novato.
- Oliver, Douglas
1951 The Pacific Islands. University of Hawaii Press, Honolulu.
- Ortiz de la Tabla Ducasse, Javier
1974 El Marques de Ovando, Gobernador de Filipinas. Escuela de Estudios Hispano-Americanos, Sevilla.

- Osborne, Douglas
 1966 The Archaeology of the Palau Islands. Bernice P. Bishop Museum Bulletin 230, Honolulu.
- Paine, Ralph D.
 1927 The Ships and Sailors of Old Salem, C. H. Simonds Company, Boston.
- Parry, J. H.
 1963 The Age of Reconnaissance: Discovery, Exploration, and Settlement 1450 to 1650. University of California Press, Berkeley.
- 1974 The Discovery of the Sea. University of California Press, Berkeley.
- Pater, Alan F.
 1968 United States Battleships: The History of America's Greatest Fighting Fleet. Monitor Book Company, Beverly Hills.
- Pauwels, P. C.
 1936 The Japanese Mandate Islands. Van Dorp, Bandoeng.
- Peattie, Mark R.
 1988 Nanyo: The Rise and Fall of the Japanese in Micronesia, 1885-1945. University of Hawaii Press, Honolulu.
- Pelagos Corporation
 1986 A Seafloor Survey of Outer Apra Harbor, Guam, Mariana Islands, U.S. Territory. Unpublished report on file, War In the Pacific National Historical Park, Agana, Guam.
- Phillip, Arthur
 1789 The Voyage of Governor Phillip to Botany Bay ... to which are added the Journals of Lieuts. Shortland, Watts, Ball & Capt. Marshall, with an Account of Their New Discoveries. John Stockdale, London.
- Potter, John S., Jr
 1972 The Treasure Diver's Guide. Doubleday and Company, Garden City.
- Prange, Gordon W. with Donald M. Goldstein and Katherine V. Dillon
 1982 At Dawn We Slept: The Untold Story of Pearl Harbor. Penguin Books, Inc., New York.
- 1982 Miracle at Midway. McGraw-Hill Book Company, Inc., New York.

- 1984 Target Tokyo: The Story of the Sorge Spy Ring. McGraw-Hill Book Company, New York.
- 1986 Pearl Harbor: The Verdict of History. McGraw-Hill Book Company, Inc., New York.
- 1988 December 7, 1941: The Day the Japanese Attacked Pearl Harbor. McGraw-Hill Book Company, New York.
- Preston, Antony
1980 Cruisers. Prentice Hall, Englewood Cliffs.
- 1981 Battleships. Crescent Books, New York.
- Purcell, David C. Jr.
1967 Japanese Expansion in the South Pacific, 1890-1935. Unpublished dissertation. University of Pennsylvania, Philadelphia.
- Putnam, George Granville
1925 Salem Vessels and Their Voyages, 4 vols. Newcomb and Gauss, Salem.
- Reisenberg, Felix, Jr.
1956 Sea War: The Story of the U.S. Merchant Marine in World War II. Reinhart and Company, New York.
- Rock, Tim
1988 Aratama Maru in Islander September 18, 3-5 (Pacific Sunday News Magazine - Agana).
- 1991 Letter to Dan Lenihan. Ms. on file, Submerged Cultural Resources Unit, Santa Fe.
- Roscoe, Theodore
1949 United States Submarine Operations in World War II. Naval Institute Press, Annapolis.
- 1953 United States Destroyer Operations in World War II. Naval Institute Press, Annapolis.
- Rosenberg, Philip Alan
1981 Shipwrecks of Truk. Philip Alan Rosenberg, Truk.
- Rosenberg, Philip and Clark Graham
1978 Divers' Guide to the Truk Lagoon. Philip Rosenberg, Truk.
- Ruggles, Richard I.
1967 Geographical Exploration by the British. In The Pacific Basin, A History of Its Geographical

- Exploration. Herman R. Friss, editor, pp. 221-255. American Geographical Society, New York.
- Russell, Scott (editor)
1982 Of Wooden Ships and Iron Men: An Historical and Archaeological Survey of the Brig Leonora. Micronesian Archaeological Survey, Report Number 15. Office of the High Commissioner, Saipan.
- Sampson, Alonzo
1867 Three Times Around the World or Life and Adventures of Alonzo D. Sampson. Express Printing Company, Buffalo, 170.
- Schults, Duane
1985 The Last Battle Station: The Saga of the U.S.S. Houston. St. Martin's Press, New York.
- Schurz, William Lytle.
1939 The Manila Galleon. Dutton, New York.
- Seidel, H.
1903 Saipan, die Hauptinsel der Deutschen Marianen. Globus vol. 86. Translation by S. Wilkins, Micronesian Area Research Center (MARC) Working Paper No. 29, Micronesian Area Research Center, University of Guam.
- Shadwell, Charles
1873 Memorandum on the Wreck of the Coryphaeus on Ailu Island, one of the Marshall Islands, March 6, 1872. Parliamentary Papers of the South Sea Islands.
- Sherman, Admiral Frederick C.
1982 Combat Command. Bantam Books, New York.
- Smith, S. E. (editor)
1966 The United States Navy in World War II. Quinn Books - William Morrow and Company, Inc., New York.
- Sowinski, Larry
1981 Action in the Pacific. Naval Institute Press, Annapolis.
- Spector, Ronald H.
1985 Eagle Against the Sun. Vintage Books, Inc., New York.
- Stafford, Commander Edward P.
1974 The Big 'E'. Ballantine Books, New York.

- Stanley, Henry E. J. S., editor and translator
1874 The First Voyage Round the World by Magellan: Translated from the Accounts of Pigafetta, and other Contemporary Writers. Hakluyt Society, Series 1, Vol. 52. Hakluyt Society, London.
- Starbuck, Alexander
1878 History of the American Whale Fishery from Its Earliest Inception to the Year 1876. First published in Part 4 of the Report of the U.S. Commission on Fish and Fisheries, Washington, D.C. Reprinted 1964 by Argosy-Antiquarian Ltd., New York.
- Stern, Robert C.
1983 U.S. Subs in Action. Squadron/Signal Publications, Inc., Carrollton.
- Stevens, John
1808 The Oriental Navigator. Lauerie and Whittle, London.
- Tetens, Alfred
1958 Among the Savages of the South Seas: Memoirs of Micronesia 1862-1868. Translated and edited by Florence M. Spohr. Stanford University Press, Stanford.
- Thomas, Michael R. and Samuel T. Price
1980 Cultural Resources Reconnaissance Report for the Saipan Small Boat Study Area. Report submitted to the U.S. Army Corps of Engineers, Pacific Division. Unpublished report on file, War in the Pacific Historical Park, Guam.
- Thomas, William L.
1967 The Pacific Basin: An Introduction. In The Pacific Basin: A History of Its Geographical Exploration. Herman R. Friss, editor, pp. 1-17. American Geographical Society, New York.
- Toland, John
1971 The Rising Sun: The Decline and Fall of the Japanese Empire. Bantam Books, Inc., New York.
- Tuchman, Barbara W.
1972 Stillwell and the American Experience in China, 1911-1942. Bantam Books, Inc., New York.
- Villiers, Alan
1949 The Coral Sea. McGraw-Hill, New York.

- Von Doenhoff, Richard A.
n.d. SMS Cormoran: Cruise of a German Raider.
- Ward, Herbert T.
1970 Flight of the Cormoran. Vantage Press, New York,
175 pp.
- Ward, R. Gerard (editor)
1966-67 American Activities in the Central Pacific,
1790-1870: A History, Geography, and Ethnography
Pertaining to American Involvement and Americans in
the Pacific Taken from Contemporary Newspapers,
etc. with introduction by Ernest S. Dodge, 8 vols.
Gregg Press, Ridgewood.
- Wawn, W. T.
1870-74 Amongst the Pacific Islands, 1870-1874.
M1971/294. Alexander Turnbull Library, Wellington,
New Zealand.
- Wheeler, Joseph
1900 Report on the Island of Guam. U.S. Adjutant
General's Office, Military Information Division,
Washington. U.S. Government Printing Office,
Washington, D.C.
- Wheeler, Richard
1983 A Special Valor: The U.S. Marines and the Pacific
War. Harper and Row, New York.
- Wood, Junius B.
1931 "Yap and Other Pacific Islands Under Japanese
Mandate" in National Geographic, Vol. XL:590-627.
Official Journal of the National Geographic
Society, Washington, D.C.
- Yatlilman, Andrew and Albert L. Williams
1986 Preliminary Guide to Micronesian References in the
Pacific Manuscripts Bureau (PAMBU) New England
Microfilming Project. Manuscript on file. On file
Micronesian Area Research Center, University of
Guam, Mangilao.
- Y'Blood, William T.
1981 Red Sun Setting: The Battle of the Philippine
Sea. Naval Institute Press, Annapolis.
- 1987 The Little Giants: U.S. Escort Carriers Against
Japan. Naval Institute Press, Annapolis.

Zaben, John P.
1987 "The Sage of the ARATAMA MARU." Guam Shinbun,
April 23, 1987.

Unpublished Manuscripts

(AGI) Archivo General de Indias, Sevilla. Filipinas 11; 12; 13; 16; 19; 82; 99; 331; 395; 415; 919. Ultramar 561; 562. (MARC, SDC, typescript) Micronesian Area Research Center, Spanish Documents Collection.

(AGN) Archivo General de la Nacion, Mexico. Filipinas 1; 2; 395; Selecciones. Inquisicion Tomo 6; 1138; Varios Tomos. Marina 19. Varios Ramos, Selecciones 1.

(AHN) Archivo Historico Nacional, Mexico. Ultramar 6853; 5854.

(AHPA) Archivo Historico de la Provincia de Aragon, San Cugat del Valles, Barcelona. E-1-a-18; E-1-c-6.

(ARSI) Archivum Romanum Societatis Iesu, Rome. Philippinas 13; 14.

(LCM) Records of the Spanish Government in the Mariana Islands. Library of Congress, Washington D.C. LCM Item 1; 2; 11; 16; 28; 32; 97.

(MN) Museo Naval, Madrid. M/S 614.

(PNA) Philippine National Archives, Manila. PNA, Bundle 1(1):8; 1(2):13; 3:7; 3:8; 3:9; 3:11; 3:12; 3:13; 3:21; 10(1):2.

Adjutant General's Office

1890-1917 Letter from Brigadier Genral Thomas M. Anderson to General H.C. Corbin. National Archives Record Group 94, no. 144687.

Aguon, Joaquin C.

1987 Oral History Informant, Talofoto, Guam. May 1987.

Juan Pobre de Zamora

1968-71 Relacion sobre la perdida del galeon San Felipe [1598-1603], Philippines MSS II, Bloomington, Indiana University, Lilly Library. University of Guam, MARC Microfilm Collection.

Library of Congress
 1678-1899 The Records of the Spanish Government in the
 Mariana Islands. Item 1; 18. Washington, D.C.

Mantanona, Tito
 1987 Oral History Informant, Talofoyo, Guam. May 1987.

Nagata, Yasuai
 1987 Personal correspondence, Kobe, Japan.

Safford, W.E.
 1901 The Mariana Islands. Notes from documents in the
 Archives at Agaña.

Tolan, Jim
 1987 Personal discussion, Asan, Guam. May 1987.

U.S. Navy
 1944 CAPERTON, Action Report. June 25, 1944.

1944 Commander Task Group 58.3 Action Report of
 Operation Against Saipan, Tinian and Guam from
 Units Pat Task Group 58.3. Naval Historical
 Center. July 12, 1944.

1944 Commander Task Group 58.4 Operation in Marianas and
 Bonins, June 6, 1944. Action Report on Naval
 Historical Center, July 13, 1944.

1943 FLYING FISH, Fourth War Patrol, January 6, 1943 to
 February 28, 1943.

1944 GREENLING, Report of Special Mission, May 7, 1944.

1943 GUDGEON, Ninth War Patrol, September 1, 1943 to
 October 6, 1943.

1943 PERMIT, Eighth War Patrol, April 1943 to May 25,
 1943.

1944 SEAHORSE, Fourth War Patrol, March 28, 1944 to
 April 27, 1944.

1943 SNAPPER, Seventh War Patrol, July 29, 1943 to
 September 17, 1943.

Yamada, Sanae
 n.d. Personal correspondence, Ashiya City, Japan.

Magazines and Journals

Guam Recorder. Vol. 6, 1941.

Guam Recorder. Second Series. Vol. 7, 1977.

Guam Recorder 1940, Naval Government, Agana, Guam. February.

Guam Recorder. January 1926; December 1938; January, May, June 1939; June, July 1949.

Journal of Pacific History. Vol. 7, 1972.

Philippine Historical Bulletin. Vol. 15. 1971.

Philippines Historical Review. 1971; 1972.

Philippine Studies. 1965; 1972; 1978.

APPENDIX A

Micronesian Island Names*

Names in all capital letters are standard names, i.e., those officially approved and recommended for current use by this guide in accord with the most recent authoritative sources.

Abamama = ABEMAMA	ANATAHAN
Abone = EBON	Anatajan = ANATAHAN
Aelingnae = AILINGINAE	Anatans = ANATAHAN
Agaigan = AGUIJAN	Anataxam = ANATAHAN
Agan = PAGAN	Anataxan = ANATAHAN
Agiguano = AGUIJAN	Anatayan = ANATAHAN
Agiguan Insel = AGUIJAN	Anathahun = ANATAHAN
Agiguwan = AGUIJAN	Andema = ANT
Agiiigan To = AGUIJAN	Angaur = NGEAUR
A Grega = AGRIHAN	Angauru = NGEAUR
Agrigan = AGRIHAN	A Ngeaur = NGEAUR
Agrigan = AGUIJAN	Angegul = NGULU
Agrigarn = AGRIHAN	Angelul = NGULU
Agriguan = AGRIHAN	Angorur Island = NGEAUR
AGRIHAN	Angour = NGEAUR
Agrijan = AGRIHAN	Anguijan = AGUIJAN
Agrijon = AGRIHAN	Angyaur = NGEAUR
Aguigan = AGUIJAN	Aniama = NAMONUITO
Aguiguan = AGUIJAN	Aninima = NAMONUITO
AGUIJAN	Anonima = NAMONUITO
Aguijan = AGRIHAN	Antajan = ANATAHAN
Aguijon = AGUIJAN	Antiajan = ANATAHAN
Agujan = AGRIHAN	Anto = ANT
Agurigan = AGRIHAN	Apaiia = ABAIANG
Ahmo = ARNO	Apaiang = ABAIANG
Ailinglablab = AILINGLAPLAP	Apamama = ABEMAMA
Ailinglap = AILINGLAPLAP	Apemama = ABEMAMA
Ailinglapalap = AILINGLAPLAP	Arakabesan = NGEREKEBESANG
AILINGLAPLAP	Armagan = ALAMAGAN
Ailinlablab = AILINGLAPLAP	ARANUKA
Ailu = AILUK	Arao = KOSRAE
AILUK	Arecifos = UJELANG
Airinginae = AILINGINAE	Argigan Island = AGRIHAN
Airingurapurapu = AILINGLAPLAP	Arhno Atoll = ARNO
Airukku = AILUK	Armstrong = KOSRAE
ALAMAGAN	ARNO
Alamaguan = ALAMAGAN	Arora = ARORAE

*Based upon Motteler, 1986.

Alemagan = ALAMAGAN
 Alimagan Island = ALAMAGAN
 Almagam = ALAMAGAN
 Almaguan = ALAMAGAN
 Amalgam = ANATAHAN
 Ana = FARALLON DE PAJAROS
 Anangai = WOLEAI
 Anangii = WOLEAI
 Anatacan = ANATAHAN
 Artomagan = ALAMAGAN
 Aruna = ARNO
 Aruno = ARNO
 Arurai = ARORAE
 Ascension = POHNPEI
 Astrolab Island = FAIS
 Astrolabe = FAIS
 Aulong = ULONG
 Aurepik Inseln = EAURIPIK
 Auripik = EAURIPIK
 Aurupig = EAURIPIK
 Aurupik = EAURIPIK
 Autumn Island = FEFAN

 Baanopa = BANABA
 BABELDAOB
 Babeldzuap = BABELDAOB
 Babelhoup Island = BABELDAOB
 Babeltaob = BABELDAOB
 Babelthaob = BABELDAOB
 Babelthaub = BABELDAOB
 Babelthaup Island = BABELDAOB
 Babelthouap = BABELDAOB
 Babelthuab = BABELDAOB
 Babelthuap = BABELDAOB
 Babeltloab = BABELDAOB
 Babeltop = BABELDAOB
 Babeltuap = BABELDAOB
 Babelutaobu = BABELDAOB
 Babelzuap = BABELDAOB
 Baberudaobu To = BABELDAOB
 Baberutaobu Jima = BABELDAOB
 Babldaob = BABELDAOB
 Bablehoup Island = BABELDAOB
 Bablethouap Island = BABELDAOB
 Bacim = GUAM
 Bacin = GUAM
 Badelzuap = BABELDAOB
 Bado Shima = FARALLON DE MEDINILLA

ARORAE
 Arorai = ARORAE
 Arrecife = UJELANG
 Arrecifes = UJELANG
 Arrecifos = BELAU
 Arrecifos Islands = UJELANG
 Arricifes = YAP
 Arricifes = YAP ISLANDS
 Artemagan = ALAMAGAN
 Baubelthouap = BABELDAOB
 Baxotristo = OROLUK
 BELAU
 BELAU OUTLIERS
 Belid = GUAM
 BELILIOU
 Bertrand Island = TARAWAI
 Bigali = PIKELOT
 Bigini = BIKINI
 Bigini = RONGELAP
 Bigini = RONGRIK
 Bikaar = BIKAR
 Bikelot = PIKELOT
 Bird Island = FARALLON DE MEDINILLA
 Bishop = TABITUEA
 Bishop Junction = ERIKUB
 Blaney = NONOUTI
 BOKAAK
 Bonabe = BANABA
 Bonabi = POHNPEI
 Bonaki = POHNPEI
 Bona Vista = TINIAN
 Bonebay = POHNPEI
 Bonebey = POHNPEI
 Bonham = JALUIT
 Bordelaise, La = OROLUK
 Bornabi = POHNPEI
 Boston = EBON
 Bota = MAUG ISLANDS
 Bota = ROTA
 Botaha = ROTA
 Brown = ENEWETAK
 Brownsrange = ENEWETAK
 Buenavista = TINIAN
 Buluath = PULUWAT
 Bunker = NAMONUITO
 Bunkey = NAMONUITO
 Bur = PULO ANNA
 BUTARITARI

Bahan = GUAM
 Bahnam = JALUIT
 Bam = GUAM
 BANABA
 Baobeltaob = BABELDAOB
 Barbadas = MURILO
 Barbados = MURILO
 Baring = NAMORIK
 Bato = MAUG ISLANDS
 Calvert Islands = AUR
 Campbellriff = OROLUK
 Carolina = YAP
 Carolina = YAP ISLANDS
 Carolinas, Islas = CAROLINE ISLANDS
 CAROLINE ISLANDS
 Carolines, Iles = CAROLINE ISLANDS
 Carteret = HELEN
 Casbobas Islands = UJELANG
 Casobos Island = UJELANG
 Cata = PULUWAT
 Catharine = UJAE
 Catherine = KWAJALEIN
 Catherine = UJAE
 Chareguam = SARIGAN
 Charlotte = ABAIANG
 Chatham Islands = ERIKUB
 Chatham Islands = WOTJE
 Cherega = SARIGAN
 Cheregua = SARIGAN
 Cheroga = SARIGAN
 Cheruguan = SARIGAN
 Chiangel = NGCHEANGEL
 Chicagov = ERIKUB
 Chromtschenko = AILINGLAPLAP
 Chuk = TRUK ISLANDS
 Clerk = ONOTOA
 Codocopuey = TOBI
 Codopuei = TOBI
 Colapa = PULAP
 Colonia = POHNPEI
 Colony Koronia = POHNPEI
 Colony Town = POHNPEI
 Concepcion, La = ALAMAGAN
 Conception, Ile de la = ALAMAGAN
 Constantin Island = KAPINGAMARANGI
 Constantine = KAPINGAMARANGI
 Cook = TARAWA
 Cook-Inseln = HALL ISLANDS

Button = UTRIK
 Button Islands = TAKA
 Buvi = MAUG ISLANDS
 Bwokwaak = BOKAAK
 Bygar = BIKAR
 Byron = NIKUNAU

 Cadocapuee = TOBI
 Cadopuei = TOBI
 Costello Reef = MINTO REEF
 Courant, Ile du = PULO ANNA
 Covel = EBON
 Covell = EBON
 Current = PULO ANNA
 Daniel = ARNO
 Dawson = BIKAR
 De Cata = PULUWAT
 Desierta = FARALLON DE PAJAROS
 Djaluit = JALUIT
 Dog = NONOUTI
 Dove = KWAJALEIN
 Drummon Island = TABITEUEA
 Drummond = TABITEUEA
 Dschaluit = JALUIT
 Dundas = ABEMAMA
 Dunkin = NUKUORO
 Duperrey = LOSAP
 Duperrey = MWOKIL
 Duperry = MWOKIL
 D'Urville Islands = LOSAP

 Eap = YAP
 Eap = YAP ISLANDS
 East Faiu = FAYU
 East Fayu = FAYU
 EAURIPIK
 EBON
 Ebongruppe = EBON
 Eboon = EBON
 Egerup = ERIKUB
 Egeu = ULITHI
 Egoi = ULITHI
 Egoy = ULITHI
 Eilu Inseln = AILUK
 Elat = ELATO
 Elath = ELATO
 ELATO
 Elivi Group = ULITHI

Cook's Group = HALL ISLANDS
 Cook-Worth Inseln = HALL ISLANDS
 Coquille = JALUIT
 Coquille = PIKELOT
 Corer = ORFOR
 Cornwallis = BOKAAK
 Corral, EL = NOMWIN
 Corror = ORFOR
 Corrora = ORFOR
 Enderby = PULUWAT
 ENEWETAK
 Eniaidok = ENEWETAK
 Eniuetakku To = ENEWETAK
 Eniwetakku = ENEWETAK
 Eniwetok = ENEWETAK
 Enywetok = ENEWETAK
 EOT
 Eourypyg = EAURIPIK
 Epon = EBON
 Erato = ELATO
 Eregub = ERIKUB
 Eregup = ERIKUB
 Ergua = AGRIHAN
 ERIKUB
 Erikup = ERIKUB
 Erippu = LIB
 Erukuppu = ERIKUB
 Escacholtz Island = BIKINI
 Escholtz Atoll = BIKINI
 Eschocholtz Atoll = BIKINI
 Escholtz = BIKINI
 Eschscholtz = BIKINI
 Etaaru To = ETAL
 ETAL
 Etaru = ETAL
 Etat Islands = ETAL
 Eten = ETTEN
 ETTEN
 Eunas Island = MAUG ISLANDS
 Eurupig = EAURIPIK
 Evening = TOBI
 Experiment = KOSRAE

 Fagauerak = WEST FAYU
 Fagau-Pissila Island = FAYU
 Fagau-Pissilu = FAYU
 Fahieu = FAYU
 Fahieu = WEST FAYU

 Eliza = BERU
 Eliza = ONOTOA
 Elizabeth Island = JALUIT
 Elleb = LIB
 Elmore = AILINGLAPLAP
 Endaaabii-Shoto = PULUWAT
 Endaabii Shoto = PULUWAT
 Endabii-Shoto = PULUWAT
 Endabi Syoto = PULUWAT
 Fala-Beguets = FANAPANGES
 Falabenas = FANAPANGES
 Falang = FEFAN
 Falebanges = FANAPANGES
 Falebenges = FANAPANGES
 Faliao = PIKELOT
 Faliau = WEST FAYU
 Faloc = IFALIK
 Falope = POHNPEI
 Faloupet = POHNPEI
 Fanadik = PULAP
 Fanadyk = PULAP
 Fananou = NOMWIN
 Fananu = NOMWIN
 FANAPANGES
 Fanedjik = PULAP
 Farnog = BELAU X-1
 Fanope = POHNPEI
 Faounaoupei = POHNPEI
 Faraarappu = FARAULEP
 Farallon = FARALLON DE PAJAROS
 FARALLON DE MEDINILLA
 Farallon de Pajajos = FARALLON
 DE PAJAROS
 FARALLON DE PAJAROS
 Farallon Pazros = FARALLON DE
 MEDINILLA
 FARAULEP
 Faraulip Atoll = FARAULEP
 Faroilap = FARAULEP
 Faroulap = FARAULEP
 Farroilap = FARAULEP
 Farroilep = FARAULEP
 Farukku = IFALIK
 Fattoilap = FARAULEP
 Faunupei = POHNPEI
 Fayaew = GAFERUT
 FAYU
 FEFAN

Faieu = FAYU
Faieu = WEST FAYU
Faijo = GA FERUT
Faituk = TOL
Faiu = FAYU
Faiu = WEST FAYU
Faiyao = WEST FAYU
Faiyou To = WEST FAYU
Fajo = FAYU
Forroilep = FARAULEP
Foueu = FAYU
Fourteen Islands = EBON
Francis = BERU
Fraser = ANT
Front Island = EOT
Fuhaesu = FAIS
Furaarappu = FARAULEP
Furukku = IFALIK
Fuyu = UMAN

GA FERUT
Gagil = GAGIL TAMIL
GAGIL TAMIL
Gagil-Tomil = GAGIL TAMIL
Gagiru-Tomiru To = GAGIL TAMIL
Gajangeru To = NGCHEANGEL
Gamirisshu-Shoto = NGEMLIS
Gamudok Island = NGE BEDANGEL
Gamudoko = NGE BEDANGEL
Garakayo Island = NGERCHEU
Garakayo To = NGEMLIS
Garangoru To = NGERCHAOL
Garbanzos = ULITHI
Gardner = FARAULEP
Garuanguru To = NGERUANGEL
Garyo To = NGEMLIS
Gaspar Rico = BOKAAK
Getsuyo To = UDOT
Getuyo To = UDOT
Gijen = AGRIHAN
Gilbert Archipelago = GILBERT
ISLANDS
GILBERT ISLANDS
Girimesu = GA FERUT
Gnotoa = ONOTOA
Goam = GUAM
Goan = GUAM
Goan Aora = GUAM

Fefen = FEFAN
Fefen Ruk = FEFAN
Feis = FAIS
Feys FAIS
Flarik Inseln = IFALIK
Foeshavlap = FARAULEP
Fono Penges = FANAPANGES
Foraulep = FARAULEP
Foroilap = FARAULEP
Greje = AGRIHAN
Griga = AGRIHAN
Griga, Volcan de = AGRIHAN
Grigan Island = AGRIHAN
Grimes = GA FERUT
Guaban = FARALLON DE PAJAROS
Guadabusu = NGE DBUS
Guadobusu Island = NGE DBUS
Guahan = GUAM
Guahon = GUAM
Guajan = GUAM
Guajano Island = GUAM
Guajon Island = GUAM
GUAM
Guamu To = GUAM
Guan = GUAM
Guana = AGRIHAN
Guap = YAP
Guap = YAP ISLANDS
Guapatsu To = NGE BAD
Guayan = GUAM
Guban = GUAM
Guerga = AGRIHAN
Guguan = GUAM
Gujeham = GUAM
Guriinitchi To = KAPINGAMARANGI
Gurimesu To = GA FERUT
Gurinitti = KAPINGAMARANGI
Guxam = GUAM
Guy Rock = FARALLON DE PAJAROS
Gwadobusu To = NGE DBUS
Gwam = GUAM
Gwan = GUAM

Hall = MURILO
HALL ISLANDS
Harmanas, Los = NAMONUITO
Harper = POHNPEI
Haru-Shima = MOEN

Goferut = GAFERUT
 Good Lookout = NGERUANGEL
 Goreor = OREOR
 Goror = OREOR
 Graf Heyden = LIKIEP
 Greca = AGRIHAN
 Greenwich = KAPINGAMARANGI
 Gregua = AGRIHAN
 Greguna = AGRIHAN
 Henderville = ARANUKA
 Herene Sho = HELEN
 Heren-Sho = HELEN
 High = GAFERUT
 Hogoleu Islands = TRUK ISLANDS
 Hogolu Islands = TRUK ISLANDS
 Hope = KOSRAE
 Hope Island = ARORAE
 Hopper = ABEMAMA
 Horu-Shoto = HALL ISLANDS
 Hoten Rif = HELEN
 Houg = TRUK ISLANDS
 HuaJan = GUAM
 Huhaesu = FAIS
 Huiyao = WEST FAYU
 Hunepet = POHNPEI
 Huraarappu = PARAULEP
 Hurd Island = ARORAE
 Hurukku = IFALIK
 Huyu-Shima = UMAN

 Ifaelhuug = IFALIK
 IFALIK
 Ifalouk = IFALIK
 Ifaluk = IFALIK
 Ifelouk = IFALIK
 Ifeluc = IFALIK
 Ifelug = IFALIK
 Ifeluk = IFALIK
 Iguana = GUAM
 Ililo = WOLEAI
 Inatajan = ANATAHAN
 Inglesa, La = PARALLON DE PAJAROS
 Inissinifau-Pissila = FAYU
 Iros = MOEN
 Iuripik = EAURIPIK

 Jabatto To = JABWOT
 Jabwat = JABWOT

 Harvest = NAMOLUK
 Hashmy Islands = NAMOLUK
 Hashnys = NAMOLUK
 Haweis = ELATO
 Heap = YAP
 Heap = YAP ISLANDS
 Helato = ELATO
 Helen Reef = HELEN
 Helut = AILINGLAPLAP
 Jardines, Los = NAMONUTTO
 Jaurepik = EAURIPIK
 Jebat = JABWOT
 Jebuat = JABWOT
 JEMO
 Jemu = JEMO
 Jimo = JEMO
 Johnstone = TOBI
 Junction = ERIKUB
 Juripik = EAURIPIK
 Jurukku To = IFALIK

 Kabahaia Inseln = WOTHIO
 Kabeneylon = KAPINGAMARANGI
 Kabonoylon = KAPINGAMARANGI
 Kadjangel = NGCHEANGEL
 Kadjangle = NGCHEANGEL
 Kadogubi = TOBI
 Kacide Jima = PAREM
 Kaibakku = NGETEKLOU
 Kaide Jima = PAREM
 Kajamble = NGCHEANGEL
 Kajangle = NGCHEANGEL
 Kajanguru = NGCHEANGEL
 Kalap = MWOKIL
 Kama = EAURIPIK
 Kapen-Mailang = KAPINGAMARANGI
 KAPINGAMARANGI
 Kap-In-Mailang = KAPINGAMARANGI
 Karorin Shoto = POHNPEI ISLANDS
 Kata = PULUWAT
 Katharine = UJAE
 Katherine = UJAE
 Kaven = MALOELAP
 Kawen = MALOELAP
 Kayangel = NGCHEANGEL
 Kayangle = NGCHEANGEL
 Kayo = PANAPANGES
 Kazanguru To = NGCHEANGEL

JABWOT
 JALUIT
 Jalwij = JALUIT
 James = UJELANG
 Jamo = JEMO
 Jap = YAP ISLANDS
 Japan Fayu = FAYU
 Jap-Gruppe = YAP
 Jap-Inseln = YAP ISLANDS
 Kingsmill Group = SOUTHERN GILBERT ISLANDS
 Kingsmill Islands = GILBERT ISLANDS
 Kingsmill Islands = SOUTHERN GILBERT ISLANDS
 Kiri = KILI
 KIRIBATI
 Kirii To = KILI
 Kiri To = KILI
 Kleimrong = RONGRIK
 Kleine-Makin = MAKIN
 Klein-Namo = NAMORIK
 KNOX
 Knox = TARAWA
 Knoy Island = TARAWA
 Kodgubi = SONSOROL ISLANDS
 Kodgubi Island = TOBI
 Kodogubi = TOBI
 Kodokopuei = TOBI
 Kolonie = POHNPEI
 Koreor Island = OREOR
 Koror = OREOR
 Kororu = OREOR
 Korrer = OREOR
 Korrer = OREOR
 KOSRAE
 KOSRAE, STATE OF
 Kotusoff = UTRIK
 Kreiangel Inseln = NGCHEANGEL
 Krusenstern = AILUK
 Kuadelen = KWAJALEIN
 Kuejerin To = KWAJALEIN
 Kuejierin To = KWAJALEIN
 Kuezyerin = KWAJALEIN
 Kunto Shoto = NEOCH
 Kuop = NEOCH
 Kusae = KOSRAE
 Kusaie = KOSRAE
 Kuasi To = KOSRAE
 Kentschikow = KWAJALEIN
 Kewley = UJELANG
 Kianguel = NGCHEANGEL
 Kile = KILI
 KILI
 Kimishima-Shoto = NEOCH
 Kimisima Syoto = NEOCH
 Kimisisima Shoto = NEOCH
 Kingsmill Group = GILBERT ISLANDS
 Kutusow = UTRIK
 Kutuzon Smolenski = UTRIK
 Kutuzov Smolenski = TAKA
 Kwadhelin = KWAJALEIN
 Kwadjalin = KWAJALEIN
 Kwadjelin = KWAJALEIN
 Kwadjelinn Inseln = KWAJALEIN
 KWAJALEIN
 Kwajalin = KWAJALEIN
 Kwajalong = KWAJALEIN
 Kwajelin = KWAJALEIN
 Kwajelinn = KWAJALEIN
 Kwajleen = KWAJALEIN
 Kwatelene = KWAJALEIN
 Kwedhelin = KWAJALEIN
 Kweijierin To = KWAJALEIN
 Kyangle = NGCHEANGEL
 La Concepcion = ALAMAGAN
 Ladrone Islands = MARIANA ISLANDS
 Ladrone, Los = MARIANA ISLANDS
 Ladrone Islands = MARIANA ISLANDS
 Lagulus = TRUK ISLANDS
 Lai = LAE
 Lambert = AILINGLAPLAP
 Lambert = NAMU
 Lamliaur Ulu Islands = NGULU
 Lamoliaur Ulu Islands = NGULU
 Lamoliau Ulu = NGULU
 Lamoliau-Uru = NGULU
 Lamoliork = NGULU
 Lamorsu = LAMOTREK
 LAMOTREK
 Lamuliur = NGULU
 Lamululudi = ULITHI
 Lamululutup = ULITHI
 Lamuniur = NGULU
 Lamureck = LAMOTREK
 Lamurrec = LAMOTREK

Kuseie = KOSRAE
 Kussai = KOSRAE
 Kussiu = KOSRAE
 Kuthiu = KOSRAE
 Kutosow Inseln = UTRIK
 Kutusoff Islands = UTRIK
 Kutusoff Smolensky = UTRIK
 Kutuson Atoll = UTRIK
 Kutusov = UTRIK
 Ligiep = LIKIEP
 Likieb = LIKIEP
 LIKIEP
 Lileb = LIB
 Linnez = EBON
 LIP = LIB
 Little Makin = MAKIN
 Little Makiu = MAKIN
 Livingston = NAMONUITO
 Livingstone = NAMONUITO
 Lord Mulgave = MILLI
 Lord Mulgrave = MILLI
 Lord North = TOBI
 Los Ladrones = MARIANA ISLANDS
 Los Marianas = MARIANA ISLANDS
 Los Matires = PULAP
 Lossop = LOSAP
 Los Valientes = NGETIK
 Louasappe = LOSAP
 Loussappe = LOSAP
 Low Islands = FAURIPYK
 Luasap = LOSAP
 Luguen = PULUWAT
 Lugulos = LUKUNOR
 Lugulus = TRUK ISLANDS
 Lugunor = LUKUNOR
 Lukeisel = LOSAP
 LUKUNOR
 Lukunor-Gruppe = MORTLOCK ISLANDS
 Lumuliur = NGULU
 Lumululutu = ULITHI
 Luta = ROTA
 Lutke = LUKUNOR
 Lutke = NAMONUITO
 Lutke-Insel = FAYU
 Lutkem Faieu = FAYU
 Lydia = KWAJALEIN
 Lydia = PIKELOT
 Lydia Island = UJAE
 Lamutrik Inseln = IAMOTREK
 Lanomituk = TRUK ISLANDS
 Larkins = OROLUK
 Legiep Islands = LIKIEP
 Leguischel = PUJAWAT
 Lejeune = PAREM
 Lemarafat, Gruppe = HALL ISLANDS
 LIB
 Ligieb = LIKIEP
 MAIANA
 Maidi = MEJIT
 Mai Jima = EOT
 Mai-Shima = EOT
 Majej = MEJIT
 Majro = MAJUORO
 MAJUORO
 Majuruk = MAJUORO
 Makarama = KAPINGAMARANGI
 Maki Meang Island = MAKIN
 MAKIN
 Makin Atoll = BUTARITARI
 Makin Maian = MAKIN
 Makin Meang = MAKIN
 Malacal = NGEHELACHEL
 Malacan = NGEHELACHEL
 Malaccan = NGEHELACHEL
 Malackan = NGEHELACHEL
 Malagal = NGEHELACHEL
 Malakal = NGEHELACHEL
 Maloelab = MALOELAP
 MALOELAP
 Mama = PULUWAT
 Manao = MAUG ISLANDS
 Mang = MAUG ISLANDS
 Mangs = MAUG ISLANDS
 MANILA REEF
 Mao = MAUG ISLANDS
 Map = MAAP
 Mapen-Mailang = KAPINGAMARANGI
 Maple Tree Island = PAREM
 Mappu To = MAAP
 Marakaru To = NGEHELACHEL
 MARAKEI
 Maraki = MARAKEI
 Margaret = UJAE
 Margaret = KWAJALEIN
 Margaretta = KWAJALEIN
 Margaretta Islands = NAMU

Macaskill = PINGELAP
 Mackenzie = ULITHI
 Mackinzie = ULITHI
 Madinilla = FARALLON DE MEDINILLA
 Madjuro = MAJURO
 Madschero = MAJURO
 Mae-Shima = EOT
 Mahjeruv = MAJURO
 Mariannas Islands = MARIANA ISLANDS
 Marianne Islands = MARIANA ISLANDS
 Marianne Ladrone Islands = MARIANA ISLANDS
 Mariannes Islands = MARIANA ISLANDS
 Maritres, Los = PULAP
 Maroerappu = MALOELAP
 Marriere, Pulo = MERIR
 Marschall Islands = MARSHALL ISLANDS
 Marshall Archipelago = MARSHALL ISLANDS
 Marshall-Gruppe = MARSHALL ISLANDS
 MARSHALL ISLANDS
 Marshall's Archipel = MARSHALL ISLANDS
 Marshalls = MARSHALL ISLANDS
 Martires Island = PULAP
 Martyres = PULAP
 Masharu-Shoto = MARSHALL ISLANDS
 Matan = ANATAHAN
 Mateletos = NGULU
 Matelotas = NGULU
 Matelotos = NGULU
 Matthew Island = MARAKEI
 Matires = PULAP
 Matires, Los = PULAP
 Matlocks Islands = MORTLOCK ISLANDS
 Matorokku-Shoto = MORTLOCK ISLANDS
 Matthew = MARAKEI
 Matthews = ABAIANG
 MAUG ISLANDS
 Mauga = MAUG ISLANDS
 Maui - MAUG ISLANDS
 Mauo = MAUG ISLANDS
 Maye Jima = EOT
 Mayug = MAUG ISLANDS
 Mcaskill = PINGELAP
 Medeinizya = FARALLON DE MEDINILLA
 Mediniija To = FARALLON DE

Margarretta = NAMU
 Maria = BERU
 MARIANA ISLANDS
 Marianas = MARIANA ISLANDS
 Marianas, Islas = MARIANA ISLANDS
 Marianas, Los = MARIANA ISLANDS
 Mariana-Shoto = MARIANA ISLANDS
 Marianen = MARIANA ISLANDS
 Marianes, Les Iles = MARIANA ISLANDS
 Meduro Island = MAJURO
 Meid = MEJIT
 Mejdit = MEJIT
 Mejichi To = MEJIT
 MEJIT
 Mejuro To = MAJURO
 Meli = MILI
 Meliel = MERIR
 Menschikoff = KWAJALEIN
 Menschikov Atoll = KWAJALEIN
 Mentschikoff = KWAJALEIN
 Mentschikow Inseln = KWAJALEIN
 Mereyon = WOLEAI
 Meriel = MERIR
 Merier = MERIR
 Merieres = MERIR
 MERIR
 Meriru-Sho = MERIR
 Mesid = MEJIT
 Metalotus = NGULU
 Meziti = MEJIT
 Mezyuro = MAJURO
 Miadi = MEJIT
 Mile = MILI
 MILI
 Mille = MILI
 Milli = MILI
 MINTO REEF
 Minto Breakers = MINTO REEF
 Minto Riff = MINTO REEF
 Minto Sho = MINTO REEF
 Mire = MILI
 Miri = MILI
 Moenn = MOEN
 Mogal = MWOKIL
 Mogemog = ULITHI
 Mogmog = ULITHI
 Moguru = MAUG ISLANDS
 Mogu To = MAUG ISLANDS

MEDINILLA
 Medinilla = FARALLON DE MEDINILLA
 Medinizea Island = FARALLON DE
 MEDINILLA
 Medinizya To = FARALLON DE
 MEDINILLA
 Mediuro = MAJURO
 Medjit = MEJIT
 Medjuron = MAJURO
 Mortlock Island = ETAL
 MORTLOCK ISLANDS
 Mortlock Islands = SATAWAN
 Mortlock-Insel = LUKUNOR
 Mortlocks = MORTLOCK ISLANDS
 Mortolockgruppe = MORTLOCK ISLANDS
 Motorokku Shoto = MORTLOCK ISLANDS
 Mototokke Shoto = MORTLOCK ISLANDS
 Mototokko Shoto = MORTLOCK ISLANDS
 Moug = MAUG ISLANDS
 Mougou = MAUG ISLANDS
 Mourileu = MURILO
 Mourilou = MURILO
 Mugmug = ULITHI
 Mukil = MWOKIL
 Mulgrave = MILI
 Mulgrove = MILI
 Murila = MURILO
 Murileu = MURILO
 Murillo Islands = MURILO
 MURILO
 Muriro = MURILO
 Musgrave = PINGELAP
 Musquillo = NAMU
 Mwaloelab = MALOELAP
 Mwekil = MWOKIL
 MWOKIL

 Nachikku To = NGETIK
 Naftan Rock = AGUIJAN
 Nafutan = AGUIJAN
 Naiad = ETAL
 Naid Islands = ETAL
 NAMA
 Nama Atoll = NAMU
 Namaluk = NAMOLUK
 Namarik Island = NAMORIK
 Nama-Shima = NAMA
 Namchikku = LAMOTREK

Mokil = MWOKIL
 Mokiri = MWOKIL
 Mokiru To = MWOKIL
 Mokor = NAMOLUK
 Monday Island = UDOT
 Monjas = MAUG ISLANDS
 Monouti = NONOUTI
 Moore Island = NGCHEANGEL
 Morning Star = UJEIANG
 Namolot = ETAL
 Namoloto = ETAL
 Namolotou = ETAL
 NAMOLUK
 Namonemeir = ETAL
 Namonesoson = ETAL
 NAMONUITO
 NAMORIK
 Namorukku = NAMOLUK
 Namotikku = LAMOTREK
 Namouin-Atoll = NOMWIN
 Namouttek = LAMOTREK
 NAMU
 Namuluc = NAMOLUK
 Namurech Island = KILI
 Namureck = KILI
 Namuric = NAMORIK
 Namurik = NAMORIK
 Namurikku = NAMORIK
 Namurrek = LAMOTREK
 Namuuin Shoto = NOMWIN
 Namwdik = NAMORIK
 Namwo = NAMU
 Namwoachiig = LAMOTREK
 Nanalake = NGFMEELACIBEL
 Nanouki = ARANUKA
 Nanuti = NONOUTI
 Naracobersa Island = NGEREKEBESANG
 Natan = ANATAHAN
 Natikku = NGETIK
 Natsu Shima = DUBLON
 Natu Sima = DUBLON
 Naura = NAURU
 Nautilus = TABITEUEA
 Nau'uru = NAURU
 Navoda = NAURU
 Navodo = NAURU
 Nawodo = NAURU
 Nema = NAMA

Namo = NAMA
 Namo = NAMU
 Namochikku To = LAMOTREK
 Namoi-Inseln = MORTLOCK ISLANDS
 Namoin = NOMWIN
 Namoliaour = OLIMARAO
 Namolipiafan Islands = NOMWIN
 Namolipiafane = NOMWIN
 Namolipiafano = NOMWIN
 Ngaregeu = NGERCHEU
 Ngarekobasang = NGEREKEBESANG
 Ngarekobasanga = NGEREKEBESANG
 Ngargol = NGERCHAOL
 Ngaric = NGETIK
 Ngarik = NGETIK
 Ngaruangel = NGERUANGEL
 Ngaruangel Reef = NGERUANGEL
 Ngaruik = NGETIK
 Ngaryk Islands = NGETIK
 Ngatik = NGETIK
 Ngaur = NGEAUR
 NGCHEANGEL
 NGEAUR
 NGEBAD
 NGEBEDANGEL
 NGEDBUS
 Ngeiangl = NGCHEANGEL
 Ngelu = NGULU
 NGEMLACHEL
 Ngemelis Group = NGEMLIS
 Ngemelis Islands = NGEMLIS
 NGEMLIS
 Ngeour = NGEAUR
 NGERCHAOL
 NGERCHEU
 Ngerchong = NGERECHONG
 Ngerebesang = NGEREKEBESANG
 NGERECHONG
 Ngereregong = NGERECHONG
 Ngerhong = NGERECHONG
 NGEREKEBESANG
 Ngergoi = NGERCHEU
 NGERUANGEL
 NGERUKEUID
 NGERUKTABEL
 Ngerukuid = NGERUKEUID
 Ngerwangel Reef = NGERUANGEL
 Ngesebus = NGEDBUS

Nema Peace = NAMA
 Nemu = NAMU
 NEOCH
 Neujahrs-Insel = MEJIT
 Nevil = TOBI
 Neville = TOBI
 New Year = MEJIT
 Ngabad = NGEBAD
 Ngajangel = NGCHEANGEL
 Ngolog = NGULU
 Ngolu = NGULU
 Ngoly = NGULU
 NGULU
 Ngurukadaoel = NGERUKTABEL
 Ngurukdapel Island = NGERUKTABEL
 Niaur = NGEAUR
 Nishidate To = NGERUKEUID
 Nishitatsu To = NGERUKEUID
 Nomituck = TRUK ISLANDS
 Nomoi = MORTLOCK ISLANDS
 Nomuti = NONOUTI
 Nomutsch = NONOUTI
 Nomuwin = NOMWIN
 Nomuwin-Shoto = NOMWIN
 NOMWIN
 Nonouki = ARANUKA
 NONOUTI
 Nonuch = NONOUTI
 Nonut = NONOUTI
 Nonuti = NONOUTI
 Nonwin-Inseln = NOMWIN
 NORTHERN GILBERT ISLANDS
 Northern Gilberts = NORTHERN GILBERT
 ISLANDS
 NORTHERN MARIANA ISLANDS
 Novago Goda, Ostrov = MEJIT
 Nugoro To = NUKUORO
 Nugoru = NUKUORO
 Nuguor = NUKUORO
 Nukuor = NUKUORO
 Nukuwar = NUKUORO
 Nukuwor = NUKUORO
 Nuteck Islands = NGETIK
 N'Yaur = NGEAUR

 Ocean Island = BANABA
 Odia = AILINGLAPLAP
 Odia = WOTJE

NGETEKLOU
 NGETIK
 Nggeiangel = NGCHEANGEL
 Ngilu = NGULU
 Ngiul = NGULU
 Ngobasangel = NGEBEDANGEL
 Ngobosangl = NGEBEDANGEL
 Ngoli = NGULU
 Ngolii = NGULU
 Olimario = OLIMARAO
 Ollap = PULAP
 Olna = WOLEAI
 Olobetapel-Inseln = NCEMLIS
 Olol Gruppe = NAMONUITO
 Olotup = ULITHI
 Olutai = ELATO
 Olutel = ELATO
 Omia-Jima = GUAM
 Omi Jima = GUAM
 Onavero = NAURU
 Onawero = NAURU
 ONGAEL
 Onoatoa = ONO'FOA
 Onolu = NGULU
 Onomarai = OLIMARAO
 Onon = NAMONUITO
 ONO'FOA
 Onoun = NAMONUITO
 Onoune = NAMONUITO
 Onoutu = ONO'FOA
 O Puluot = PULUWAT
 Oraluk = OROLUK
 Ora-Magan = ALAMAGAN
 Orauru-Fels = MANILA REEF
 OREOR
 Orokuizu = NGERUKEUID
 Orolong = ULONG
 OROLUK
 ORONA
 Orono = ORONA
 Ororukku = OROLUK
 Ororu Shoto = NAMONUITO
 Orukuizu = NGERUKEUID
 Orulong = ULONG
 O Sauk = PULUWAT
 Ot = EOT
 Ota = MAUG ISLANDS
 Ota-Mao = MAUG ISLANDS
 Odjia = WOTJE
 Odtia = WOTJE
 Oja = ALLINGLAPIAP
 Ola = TRUK ISLANDS
 Oleai = WOLEAI
 Oleei = WOLEAI
 Olic = WOLEAI
 OLIMARAO
 Olimarau = OLIMARAO
 Paanopa = BANABA
 PACAN
 Pagaon = PACAN
 Pagara = PACAN
 Pagenema = PAKIN
 Pagon = PACAN
 Paguenema = PAKIN
 Painipete = POHNPEI
 Pais = FAIS
 Paiz = FAIS
 Pajaros = FARALLON DE PAJAROS
 Pakeen = PAKIN
 PAKIN
 Palaoa = BELAU
 Palao Inseln = BELAU
 Palaos Islands = BELAU
 Palau = BELAU
 Palau Group = BELAU
 Palau Island = BABELDAOB
 Palau Islands = BELAU
 Palaus, The = BELAU
 Paleu = BELAU
 Pallay, Le Groupe = BELAU
 Pallou Islands, The = BELAU
 Pally = BELAU
 Palo Anna Island = PULO ANNA
 Paloc = BELAU
 Palolo = PULO ANNA
 Palos, Les = BELAU
 Panipete = POHNPEI
 Panlog = BELAU
 Panlog = BABELDAOB
 Panlong Island = BABELDAOB
 Panloq = BABELDAOB
 Parnog = BELAU
 Panopea = BANABA
 Paolo = PULO ANNA
 Papan = PACAN
 Param = PAREM

Otdia Island = WOTJE
 Otirik = UTRIK
 Oualan = KOSRAE
 Ouap = YAP
 Ouap = YAP ISLANDS
 Ouleai = WOLEAI
 Oulevai = WOLEAI
 Ouluthy = ULITHI
 Paxaros Island = FARALLON DE
 MEDINILLA
 Paygan = PAGAN
 Peace = NAMA
 Peaked Hill = TOBI
 Pedder = ARNO
 Pedul = NGEREKEBESANG
 Peeloo Islands = BELAU
 Pegan = PAGAN
 Pegon = PAGAN
 Peguenema = PAKIN
 Pelau-Inseln = BELAU
 Pelelap = PINGELAP
 Pelelep = PINGELAP
 Pelelew = BELILIOU
 Pelelew Islands = BELAU
 Peleliou = BELILIOU
 Peleliu = BELILIOU
 Peleu = BELAU
 Pelew = BELAU
 Peliliou = BELILIOU
 Pelilu = BELILIOU
 Pellow, Iles de = BELAU
 Pelli = BELAU
 Pellow = BELAU
 Perem, Insel = PAREM
 Periadik = PAREM
 Periryu = BELILIOU
 Peroat = BERU
 Peru = BERU
 Pescadaro = RONGRIK
 Pescadore = RONGELAP
 Pescadore Islands = RONGRIK
 Pescadores = RONGRIK
 Pescadores = KAPINGAMARANGI
 Petrel-Insel = BOKAAK
 Philip = SOROL
 Phillip Islands = SOROL
 Piagelap = PINGELAP
 Pigailoe = WEST FAYU

Parao = BABELDAOB
 Parao = BELAU
 Parao-Jima = BELAU
 PAREM
 Pasion, Islas de la = NGETIK
 PATA
 Patterson Islands = NAMU
 Paulogue = BELAU
 Pikaaru To = BIKAR
 Pikala = PIKELOT
 Pikaru = BIKAR
 Pikela = PIKELOT
 PIKELOT
 Pikiini = BIKINI
 Pikinni To = BIKINI
 Pikiram = KAPINGAMARANGI
 Pililau = BELILIOU
 Pililer = BELILIOU
 Pililiu = BELILIOU
 Pililju = BELILIOU
 Pililu = BELILIOU
 Piliu Insel = BELILIOU
 Pillilew = BELILIOU
 Pingarappu To = PINGELAP
 PINGELAP
 Pingerappu = PINGELAP
 Pingoulap = PINGELAP
 Pitt = MAKIN
 Pitts = MAKIN
 Placeres = NOMWIN
 Pleasant = NAURU
 POHNPEI
 POHNPEI, STATE OF
 POHNPEI ISLANDS
 Pohnpey = POHNPEI
 Pokaakku = BOKAAK
 Pokak = BOKAAK
 Pokela = PIKELOT
 Pollap = PULAP
 POLLE
 Poloac = PULUWAT
 Poloat = PULUWAT
 Poloot = PULUWAT
 Polot = PULUWAT
 Polowat = PULUWAT
 Polut = PULUWAT
 Ponape = POHNPEI
 Ponape Islands = POHNPEI ISLANDS

Pigali = PIKELOT
 Pigelot = PIKELOT
 Pigerappu = PINGELAP
 Pigerotto = PIKELOT
 Pigoualao = PIKELOT
 Pigouelao = PIKELOT
 Pihg = PIKELOT
 Pij = PIKELOT
 Pourappu = PULAP
 Pouynipete = POHNPEI
 Pragan = PAGAN
 Praien = PAGAN
 Prajan = PAGAN
 Princessa Island = JABWOT
 Princessa Island = LIB
 Princesse = LIB
 Providence = UJELANG
 Puinipet = POHNPEI
 Pul = PULO ANNA
 Pul = PULUWAT
 PULAP
 Pullep = PULAP
 Pullop = PULAP
 Pulo = PULO ANNA
 Pulo Ann = PULO ANNA
 PULO ANNA
 Pulo Anne = PULO ANNA
 Pulo Merier = MERIR
 Pulosuk = PULUSUK
 Pulu Suge = PULUSUK
 Puluhot = PULUWAT
 Puluot = PULUWAT
 PULUSUK
 PULUWAT
 Punipiet = POHNPEI
 Punlac = BELAU
 Punlog = BELAU
 Pur = PULO ANNA
 Puru = PULO ANNA
 Puru Anna = PULO ANNA
 Puttep = PULAP
 Puynipet = POHNPEI
 Pwele = POLLE
 Pyghella = PIKELOT

 Quadelen = KWAJALEIN
 Qualan = KOSRAF
 Queangal = NGCHEANGEL

 Ponapei = POHNPEI
 Ponapi Island = POHNPEI
 Pone = POLLE
 Ponpei = POHNPEI
 Poraro = FARALLON DE PAJAROS
 Poulo = PULO ANNA
 Poulouote = PULUWAT
 Pouloupa = POHNPEI
 Ralick = RALIK CHAIN
 RALIK CHAIN
 Ralik-Kette = RALIK CHAIN
 Rarikku = RALIK CHAIN
 Rarikku Chen = RALIK CHAIN
 Ratack = RATAK CHAIN
 RATAK CHAIN
 Ratakku Chen = RATAK CHAIN
 Ratakku Retto = RATAK CHAIN
 Rattakadokoru Island = ULONG
 Raven = NGETIK
 Raven's Island = NGETIK
 Remp = NAMONUITO
 Remplie de Volcans = PAGAN
 Remski-Korsakoff = AILINGINAE
 Reyes, Los = MURILLO
 Reyes, Los = ULITHI
 Rikiappu = LIKIEP
 Rimski-Korsakoff = RONGELAP
 Rimski-Korsakoff Atoll = AILINGINAE
 Rimski-Korsakoff Island = RONGRIK
 Rimski Korsakov = RONGELAP
 Rimsky Korsacoff = RONGELAP
 Rocher = FARALLON DE MEDINILLA
 Rocher = TAMANA
 Rocher de Guy = FARALLON DE PAJAROS
 Rock Islands = CHELBACHEB
 Rocker = FARALLON DE MEDINILLA
 Roger Simpson Island = ABEMAMA
 Romanzoff = WOTJE
 Romanzov = WOTJE
 Romanzow = WOTJE
 Rongarappu = RONGELAP
 Rongdik = RONGRIK
 Rongelab = RONGELAP
 RONGELAP
 Rongerik = RONGRIK
 Rongirik = RONGRIK
 Rongirikku = RONGRIK
 Rongorappu To = RONGELAP

Quirosa = POHNPEI
 Quolan = KOSRAE
 Quollen Island = KOSRAE

 Radac = RATAK CHAIN
 Radack = RATAK CHAIN
 Radokala Islands = RONGRIK
 Ralic = RALIK CHAIN
 Royal Islands = NEOCH
 Royalist = NEOCH
 Royalist = LOSAP
 Ruc = TRUK ISLANDS
 Rug = TRUK ISLANDS
 Ruk = FEFAN
 Ruk = TRUK ISLANDS
 Rukgruppe = TRUK ISLANDS
 Ruku = TRUK ISLANDS
 Rukunoru = LUKUNOR
 Rukutee To = FAYU
 Rukute To = FAYU
 Rukuto = FAYU
 Rull = YAP
 Rummyantsov = WOTJE
 Runalin = PULAP
 Rvaen Group = NGETIK

 Saepan = SAIPAN
 Saespara = SAIPAN
 Saint Andre = SONSOROL
 Saint Andre = SONSOROL ISLANDS
 Saint Andrew = SONSOROL
 Saint Andrew = SONSOROL ISLANDS
 Saint Andrews Islands = SONSOROL
 ISLANDS
 Saint Ange, Ile de = AGUIJAN
 Saint Anne, Ile = ROTA
 Saint Charles, Ile de = SARIGAN
 Saint Ignace, Ile de = PAGAN
 Saint Joseph, Ile de = SAIPAN
 Sainte Jean = GUAM
 Sainte Laurent = MAUG ISLANDS
 Sainte Philippe, Ile de = GUGUAN
 SAIPAN
 San Agustino Island = OROLUK
 San Andreas = SONSOROL
 San Andreas = SONSOROL ISLANDS
 San Andres = SONSOROL ISLANDS
 San Bartolome = PULUSUK

 RONGRIK
 Ronlat = PULAP
 Rora = MOEN
 Rosappu = LOSAP
 Rosoppu Shoto = LOSAP
 Ross = NAMU
 Rotcher = TAMANA
 Roug = TRUK ISLANDS
 San Ignacio = PAGAN
 San Joachim, Ile de = ANATAHAN
 San Joaquin = ANATAHAN
 San Joaquine = ANATAHAN
 San Jose = SAIPAN
 San Juan = GUAM
 San Lorenzo = MAUG ISLANDS
 San Rafael = NAMA
 Sanserol = SONSOROL
 Sanserol = SONSOROL ISLANDS
 Sansoral = SONSOROL
 Sansoral Islands = SONSOROL ISLANDS
 Santa Ana = ROTA
 Santa Angel = AGUIJAN
 Santo Angel = AGUIJAN
 Sapan = ROTA
 Saraon = SOROL
 SARIGAN
 Sarignan = SARIGAN
 Sarigoan = SARIGAN
 Sariguan = SARIGAN
 Sariguwan = SARIGAN
 Sarigwan To = SARIGAN
 Saroan = SOROL
 Sarol = SOROL
 Sarpan = ROTA
 Sarpana O'Rota = ROTA
 Sarpanta = ROTA
 Sasaon = SATAWAL
 Saspan = SAIPAN
 Sataawal = SATAWAL
 Satahoal = SATAWAL
 Satahual = SATAWAL
 Sataoan = SATAWAN
 Sataual = SATAWAL
 Satauan-Insel = SATAWAN
 Satavan = SATAWAL
 SATAWAL
 SATAWAN
 Satawan = SATAWAL

San Bartolomeo = PULUSUK	Satoan = SATAWAL
San Bartolomeo = BOKAAK	Satoan = SATAWAN
San Bartomeo = PULUSUK	Satouwan = SATAWAN
San Carlos = SARIGAN	Satowal = SATAWAL
San Carlos = TOBI	Satowalairak = SATAWAL
San Carol = SARIGAN	Satual = SATAWAL
San Estevan = NOMWIN	Satuwal = SATAWAL
San Francisco Javier = AGRIHAN	Saypan = SAIPAN
Schank = NAURU	Sonsonrrol = SONSOROL
Schantz-Inseln = WOTHO	Sonsonrrol = SONSOROL ISLANDS
Schanz = WOTHO	Sonsoral = SONSOROL
Scheludsch = JALUIT	Sonsoral = SONSOROL ISLANDS
Schuk = TRUK ISLANDS	SONSOROL
Seben Islands = NGETIK	SONSOROL ISLANDS
Seipan = SAIPAN	Sonsoru = SONSOROL ISLANDS
Seniavin Islands = POHNPEI ISLANDS	Sonsoru To = SONSOROL
Seniavina = POHNPEI ISLANDS	Sontserol = SONSOROL
Seniavine Islands = POHNPEI ISLANDS	Sontserol = SONSOROL ISLANDS
Seniawina Inseln = POHNPEI ISLANDS	Sonzeral = SONSOROL
Senjawan-Inseln = POHNPEI ISLANDS	Sonzeral = SONSOROL ISLANDS
Senyavin Islands = POHNPEI ISLANDS	Sonzerol = SONSOROL
Sepam = SAIPAN	Soral = SOROL
Sequeira = NGULU	SOROL
Serpana = ROTA	Sororu = SOROL
Serpent = UJAF	Sorou To = SOROL
Sespan = SAIPAN	Sotoan Atolle = SATAWAN
Seteoel = SATAWAL	Souserol = SONSOROL
Setoan = SATAWAL	Souserol = SONSOROL ISLANDS
Setuahal = SATAWAL	SOUTHERN GILBERT ISLANDS
Seven Islands = NGETIK	Souworoff Island = TAKA
Seypan = SAIPAN	Spencerkeys = NGULU
Shank Island = NAURU	Spring Island = MOEN
Shanz Island = WOTHO	Stawan Islands = SATAWAN
Shiraau = KOSRAE	Strong = KOSRAE
Siebzig Inseln = NGERUKEUID	Stsiuck = TRUK ISLANDS
Simpson Island = ABFMAMA	Suiyo To = TOL
Six Isles = ABALANG	Summer Island = DUBLON
Skiddy = NAMOLUK	Sunrise = RATAK CHAIN
Smyth = BOKAAK	Sunset = RATAK CHAIN
Snonimus = NAMONUITO	Supan = SAIPAN
Soisol = SONSOROL	Survorov = TAKA
Soisol = SONSOROL ISLANDS	Susanne Bank = MANTIA REEF
Sonesor = SONSOROL	Susuki Jima = SIIS
Sonesor = SONSOROL ISLANDS	Suvarov = TAKA
Songosor = SONSOROL	Suwarow = TAKA
Songosor = SONSOROL ISLANDS	Suzuki Jima = SIIS
Sonisol = SONSOROL ISLANDS	Swede = LAMOTREK
Sonrol = SONSOROL	Sybilla-Inseln = BOKAAK

Sonrol = SONSOROL ISLANDS
 Sonserol = SONSOROL
 Sonserol = SONSOROL ISLANDS
 Sonseron = SONSOROL
 Sonseron = SONSOROL ISLANDS
 Sonsol = SONSOROL
 Sonsol = SONSOROL ISLANDS
 Sonsonorol = SONSOROL ISLANDS
 Takai = TAKA
 Take = ETTEN
 Takee = TAKA
 TAMANA
 Tamatam = PULAP
 Tamatan = PULAP
 Tamesa Reef = MANILA REEF
 Tametam = PULAP
 Tanian = TINIAN
 Taongi = BOKAAK
 Tapeteuea = TABITEUEA
 Tapetua = TABETEUEA
 Tapiteouea = TABITEUEA
 Tapiteuea = TABITEUEA
 Tapituwea = TABITEUEA
 Taputeuea Island = TABITEUEA
 Taputeuna = TABITEUEA
 Taputeuwea = TABITEUEA
 Taputoouea = TABITEUEA
 TARAWA
 Tarawa = TARAWAI
 TARAWAI
 Taritari = BUTARITARI
 Tarowa = TARAWA
 Tebat = JABWOT
 Tebot = JABWOT
 Tebut = JABWOT
 Tebut = LIB
 Tegi = TAKA
 Teke = TAKA
 Telut = JALUIT
 Temetem = PULAP
 Temo = JEMO
 Tendanie = TARAWAI
 Tendanje = TARAWAI
 Tendanye = TARAWAI
 Tenian = TINIAN
 Teyea = KOSRAE
 Teyoa = KOSRAE
 Thief Islands = NGULU

Sydeham Island = NONOUTI
 Sydenham = NONOUTI
 Tabiteual = TABITEUEA
 TABITEUEA
 Tabuteuea = TABITEUEA
 Tagai = TAKA
 TAKA
 TINIAN
 Tinianion = TINIAN
 Togobei = TOBI
 Toke = TAKA
 Tokobe = TOBI
 Tokobei Island = TOBI
 Tokobi = TOBI
 TOL
 TOL GROUP
 Toloas = DUBLON
 Tomil = GAGIL TAMIL
 Tomil-Gamil = GAGIL TAMIL
 Ton = TOL
 Tonoas = DUBLON
 Tonowas = DUBLON
 Torakku-Shoto = TRUK ISLANDS
 Torres = POHNPEI
 Torres = TRUK ISLANDS
 TOTIU
 Touching = BUTARITARI
 Traversey = AUR
 Tromelin = FAIS
 Tromlin Island = FAIS
 TRUK, STATE OF
 TRUK ISLANDS
 Tschitschagoff = ERIKUB
 Tsis = SIIS
 Tucker = SATAWAL
 Tuesday Island = FANAPANGES
 Tuna = MAUG ISLANDS
 Tunas = MAUG ISLANDS
 Tungaru = GILBERT ISLANDS
 Two Sisters = IFALIK
 Ualan = KOSRAE
 Ualang = KOSRAE
 Uap = YAP
 Uap = YAP ISLANDS
 Uauak = PULUWAT
 Udiric = UTRIK

Thief's Islands = MARIANA ISLANDS
 Thirteen Island = WOLEAI
 Thursday Island = PATA
 Tiemo = JEMO
 Timo = JEMO
 Tina = MAUG ISLANDS
 Tindal = AILUK
 Tindal and Watts Island = AILUK
 Uieto = NAMONUITO
 UJAE
 Ujamilai = UJAE
 Ujelan = UJELANG
 UJELANG
 Ujilang = UJELANG
 Ujilong Island = UJELANG
 Ujiran To = UJELANG
 Ujlang = UJELANG
 Uldi = ULITHI
 Ulea = WOLEAI
 Uleai = WOLEAI
 Uleay = WOLEAI
 Uler = BELLILOU
 Ulevy = ULITHI
 Ulewi = ULITHI
 Ulie = WOLEAI
 ULITHI
 Uliti = ULITHI
 Ulitigruppe = ULITHI
 Uilea = WOLEAI
 ULONG
 Ululssi Inseln = ULITHI
 Ulussi = ULITHI
 Uluta = ULITHI
 Uluthi = ULITHI
 Uluthy = ULITHI
 Uluti = ULITHI
 Ulutup = ULITHI
 UMAN
 Umol = UMAN
 Unawb = YAP
 Unawb = YAP ISLANDS
 Uncay = WOLEAI
 Unney = WOLEAI
 Uoeu Inseln = ULITHI
 Uojjie Atoll = WOTJE
 Uola Insel = MOEN
 Urac = FARALLON DE PAJAROS
 Urac = MAUG ISLANDS
 Udirick Islands = UTRIK
 Udjae = UJAE
 Udjelang = UJELANG
 Udjelong = UJELANG
 UDOT
 Ueito = NAMONUITO
 Ugeu Inseln = ULITHI
 Ugulut = TRUK ISLANDS
 Uramagan = ALAMAGAN
 Urckthapel = NGERUKTABEL
 Uricas = FARALLON DE PAJAROS
 Urracas = FARALLON DE PAJAROS
 Urracas Islands = MAUG ISLANDS
 Urracas y Farallon de Pajaros =
 FARALLON DE PAJAROS
 Urracus = MAUG ISLANDS
 Urucdzapel = NGERUKTABEL
 Uruckzapel = NGERUKTABEL
 Urukdzapel = NGERUKTABEL
 Urukdsapel = NGERUKTABEL
 Urukethaburu = NGERUKTABEL
 Uruksapel = NGERUKTABEL
 Uruktapel Island = NGERUKTABEL
 Uruktapi = NGERUKTABEL
 Urukthapel = NGERUKTABEL
 Urukthapel = NGERUKTABEL
 Urukutaaburu To = NGERUKTABEL
 Urukutaburu = NGERUKTABEL
 Urukutapuru = NGERUKTABEL
 Urushi = ULITHI
 Urusi To = ULITHI
 Usu Shima = SIIS
 Utet = UDOT
 Utorokku = UTRIK
 Utot = UDOT
 UTRIK
 Uyae = UJAE
 Uyap = YAP
 Uyap = YAP ISLANDS
 Uziran = UJELANG
 Uzyae = UJAE
 Valientes Islands = NGETIK
 Valientes, Los = NGETIK
 Velas Latinas, Islas de las =
 MARIANA ISLANDS
 Vogelinsel = FARALLON DE PAJAROS
 Volid = GUAM

Uracas = FARALLON DE PAJAROS
Uracas = FARALLON DE MEDINILLA
Uracas, Les Iles = MAUG ISLANDS
Uraccas Island = MAUG ISLANDS
Urakas = FARALLON DE MEDINILLA
Urakas = MAUG ISLANDS
Urakas = FARALLON DE PAJAROS
Urakasu = FARALLON DE PAJAROS
Warren Hastings = MERIR
Watehluhk = OROLUK
Watts = AILUK
Wednesday Island = TOL
Wela = MOEN
Wela-Tolos = DUBLON
Weleeya = WOLEAI
Welhimerahw = OLIMARAO
Wellington = MWOKIL
West Faiu = WEST FAYU
West Faju = WEST FAYU
WEST FAYU
Westervelts Islands = LOSAP
William IV-Insel = POHNPEI
William the Fourth = ANT
Wilson = IFALIK
Winter Island = UMAN
Wishard Reef = MINTO REEF
Woche = WOTJE
Woddo Inseln = WOTHO
Wojja = WOTJE
Wojje To = WOTJE
Wola = MOEN
Wola Haru = MOEN
Wolai Islands = WOLEAI
Wolea = WOLEAI
WOLEAI
Wona = MOEN
WONEI
Wono = MOEN
WOTHO
WOTJE
Wotsch = WOTJE
Wotshe = WOTJE
Wottho = WOTHO
Wotto = WOTHO
Wozzie = WOTJE
Wuap = YAP ISLANDS
Wuap, Insel = YAP
Wuidjlang = UJELANG

Volin = GUAM

Walan = KOSRAE
Walang = KOSRAE
Walau = BELAU
Wap = YAP
Wap = YAP ISLANDS
Waqab = YAP ISLANDS
YAP ISLANDS
Yapa = YAP
Yapa = YAP ISLANDS
Yappu = YAP ISLANDS
Yappu To = YAP
Yaruto = JALUIT
Yaurwpiig = EAURIPK
Ylatu = ELATO
Yoropie = EAURIPK
Yorupikku = EAURIPK
Yroupikku To = EAURIPK
Young-William = LUKUNOR
Young William Islands = SATAWAN
Young William's Group = SATAWAN
Yuripik = EAURIPK

Zaraol = SOROL
Zarol = SOROL
Zarpana = ROTA
Zarpane = ROTA
Zarpano = ROTA
Zeipan = SAIPAN
Zerpan = SAIPAN
Zinian = TINIAN
Zwadjelinn = KWAJALEIN
Zyabatto = JABWOT

Wul = PULO ANNA
Wull = PULO ANNA

Yaeluth = ELATO
Yaluit = JALUIT
Yaluto = ELATO
YAP
YAP, STATE OF

With permission of Bishop Museum
Press, all copyright laws still apply.

APPENDIX B

WORLD WAR II IN THE CENTRAL PACIFIC--A CHRONOLOGY

By Don Boyer

<u>DATE</u>	<u>EVENTS</u>
1914-1941	Japan gains control over the Central Pacific Islands as a result of her participation in WWI. The League of Nations gives Japan a mandate over the Marshalls, Carolines and Marianas (with the exception of Guam). During the interwar years Japan develops areas of these islands as air and naval bases.
1931-1941	Japan's involvement in China and Manchuria, spurred by the controlling radical elements of the Japanese Army and their political supporters, creates increasing political conflict with the United States.
12/3/41	The coded signal "Niiitakayama nobore" is sent to the Japanese fast carrier task force approaching Pearl Harbor, committing the Japanese to the attack on Pearl Harbor.
12/7/41	Pearl Harbor attacked, initiating WWII in the Pacific. Japan simultaneously attacks Malaysia and the Dutch East Indies.
12/8/41	Japanese aircraft attack the Philippines, catching most of Gen. Douglas MacArthur's air forces on the ground, in preparation for the upcoming amphibious invasion. Guam, Midway and Wake are also attacked by air, surface and submarine forces.
12/10/41	Guam surrenders to Japanese assault forces, after resistance by local defense forces.
12/10/41	Aircraft from U.S.S. ENTERPRISE sink a Japanese submarine north of Hawaii, first warship victim for the U.S. Navy.

- 12/11/41 Japanese forces staging from the Central Pacific attempt the first assault on Wake Island. U.S. Marines repulse this attack. Three old Japanese destroyers are sunk and light cruiser YUBARI and several transports damaged.
- 12/21/41 Japanese invasion forces land in the northern Philippines.
- 12/23/41 Wake island falls to a second Japanese assault. The U.S. now has no territory between Hawaii and the Philippines.
- 1/26/42 Rabaul, on the island of New Britain falls to Japanese forces along with Kavieng on the island of New Ireland. These two well-harbored island bases become major naval and air bases for the Japanese, forming the southern leg of the Palau-Truk-Rabaul triangle which the Japanese intended to use as the jumping-off point for further expansion in the south Pacific.
- 2/1/42 U.S. aircraft carriers ENTERPRISE and YORKTOWN with accompanying cruisers stage the first attacks against Japanese positions in the Central Pacific, raiding Jaluit, Mili, Wotje, Maloelap, Kwajalein, Roi and Makin.
- 2/20/42 A U.S. carrier task force en route to raid Rabaul is detected and intercepted by Japanese land-based aircraft and forced to turn back without loss. Japanese aircraft losses were heavy, and the threat of carrier attack sets the Japanese timetable for the invasion of New Guinea back.
- 3/3/42 Two Japanese "Emily" seaplanes staging from the Marshall Islands attack Pearl Harbor at night after refueling from a submarine at French Frigate Shoals west of Hawaii. No damage was caused.
- 4/18/42 Carrier HORNET launches Lt. Col. "Jimmy" Doolittle's B-25s against Tokyo and other targets in Japan. Damage was light, but the attack caused considerable "loss of face" for the Japanese high command, who, among other things, delayed further expansion into the Pacific and firmed up plans for the Midway operation. U.S. forces gain considerable

radio intelligence from following Japanese transmissions regarding the Tokyo raid.

- 5/3/42 Japanese forces occupy Tulagi Island in the Solomons and later begin construction of an airfield on nearby Guadalcanal. These bases were needed by the Japanese for their planned southward expansion to cut the U.S.-Australia supply lines; they were the last territorial gains by the Japanese in the Pacific.
- 5/4-8/42 Battle of the Coral Sea. First naval battle between aircraft carriers. U.S. forces lose carrier LEXINGTON, oiler NEOSHO and destroyer SIMS; fleet carrier YORKTOWN is damaged. Japanese forces lose small carrier SHOHO and destroyer KIKUZUKI, with major damage to fleet carrier SHOKAKU. A tactical Japanese victory, strategically, the U.S. thwarted the New Guinea invasion, delaying Japanese plans once again. Damage to SHOKAKU and the decimation of ZUIKAKU'S air groups kept these two ships out of the Midway operation.
- 5/6/42 Corregidor in the Philippines surrenders, last U.S. territory in the Pacific. A bitter and tragic defeat for the U.S., the defense of the Philippines had, in fact, occupied so many Japanese troops and so much equipment for so long that other operations in the Pacific, particularly the Solomons/New Guinea operations, were set back and lacked full military support.
- 5/20/42 Adm. Chester Nimitz, Commander in Chief of the Pacific Fleet, begins deploying his forces for the Battle of Midway. Tipped off by intelligence decryptations of Japanese naval radio traffic, Nimitz is not fooled by Japanese plans for a diversionary attack in the Aleutians.
- 6/3-4/42 The Battle of Midway commences when aircraft from small Japanese carriers RYUJO and JUNYO attack Dutch Harbor, inflicting minimal damage and confirming U.S. intelligence estimates of the upcoming battle for Midway.
- 6/4-6/42 The Battle of Midway. Carriers ENTERPRISE, YORKTOWN and HORNET under command of Admirals Fletcher and Spruance pull off the greatest ambush in naval history. On June 4,

dive-bombers from ENTERPRISE sink carriers AKAGI and KAGA while YORKTOWN'S aircraft get SORYU. Later the same day HIRYU is sunk by ENTERPRISE and YORKTOWN aircraft. Japanese heavy cruiser MIKUMA is lost the next day while U.S. forces lose YORKTOWN to air and submarine attack as well as destroyer HAMMANN. The American victory at Midway had enormous strategic consequences, as it deprived the Japanese Navy of its primary carrier arm, making their entire Pacific empire far more vulnerable to attack and far less likely to withstand attack.

8/7/42

The 1st Marine Division reinforced of some 11,000 men lands on Guadalcanal and Tulagi, securing these islands and the incomplete airfield on Guadalcanal by August 8, initiating the longest battle in American history, the six-month and two-day fight for Guadalcanal. The attrition warfare that ensued was exactly the type of battle the Japanese could not successfully engage in, particularly as the Guadalcanal area was at the extreme limit of Japanese land-based air coverage from Rabaul.

8/17/42

U.S. Marine Raiders under Lt. Col. Evans F. Carlson stage a raid on Makin Island in the Gilberts as a test of the defenses in the Central Pacific. The Japanese garrison was destroyed and the Marines lost about 30 men. In a sense, the raid was detrimental to the U.S. war effort in that it tipped the Japanese to their weak defenses in the Central Pacific and they began reinforcing bases in the area--particularly Tarawa.

8/24-25/42

Battle of the Eastern Solomons. Japanese carrier forces staging from Truk attempt to support the Japanese effort to recapture Guadalcanal but are turned back by U.S. carriers. Small carrier RYUJO is lost and SHOKAKU takes another pounding while American carrier ENTERPRISE is severely damaged. This battle demonstrates that the Japanese cannot really cover the Solomons from their existing bases in Rabaul and the Central Pacific; lack of aircraft carriers contributes to this problem.

- 10/26/42 Battle of the Santa Cruz Islands. Japanese carrier forces, again staging through Truk, attempt to support the reinforcement of Guadalcanal and destroy American carrier forces in the area. SHOKAKU suffers severe damage again; U.S. carrier HORNET is sunk and ENTERPRISE damaged. The Japanese again fail to recapture the initiative in the Solomons.
- 11/12-15/42 Two major night engagements between Japanese and American surface forces in two days result in severe losses for both sides. Japan loses two battleships (HIEI and KIRISHIMA) as well as 3 destroyers and 11 transports, failing in yet another attempt to reinforce Guadalcanal. U.S. forces lose 2 light cruisers and 7 destroyers, but turn a stalemate into a victory.
- 12/12/42 The Imperial Japanese Navy makes the formal recommendation to evacuate Guadalcanal because of the enormous losses of ships, aircraft and men. On 12/31/42, the Japanese Army agrees to withdraw and form a new defense line centered on northern New Guinea.
- 2/9/43 Organized Japanese resistance on Guadalcanal ends following the successful evacuation of over 10,000 Japanese troops. The U.S. Navy and Marine Corps, in cooperation with the Army are in a position to commence operations up the Solomons chain, aiming at Rabaul.
- 4/18/43 Adm. Isoroku Yamamoto, Commander in Chief of the Combined Fleet is ambushed and killed just prior to landing at Bougainville for an inspection tour. An intelligence decryption of a Japanese radio message tipped the Americans off to Yamamoto's itinerary. Admiral Yamamoto's death was a severe blow to the Imperial Navy, as he was its guiding light for the early war years. Ironically, Yamamoto became Commander in Chief primarily because he so vehemently opposed war with the United States that he was under constant threat of assassination while he was serving ashore in the Navy Ministry before the war.
- 6/30/43 U.S. forces commence operations to capture the upper Solomons, operations aimed at the eventual capture of Rabaul.

7/1/43 U.S. Marines capture Viru Harbor on New Georgia.

7/2/43 U.S. Army forces land at Munda, New Georgia.

7/5-6/43 Naval Battle of Kula Gulf.

7/28/43 Japanese evacuate Kiska in the Aleutians.

8/16/43 Army and Marine units land on Vella Lavella, bypassing Kolombangara.

9/1/43 U.S. fast carrier task force attacks Marcus Island, the combat debut of the F6F Hellcat fighter.

9/19/43 U.S. Navy and Army aircraft commence attacking Tarawa in the Gilbert islands, prelude to the upcoming invasion.

10/4/43 Fast carriers and surface ships attack Wake.

11/1/43 U.S. Marines invade Bougainville.

11/12/43 Japanese withdraw major units of naval and Army aircraft from Rabaul. Rabaul is by this time effectively neutralized and is stricken from the American invasion planning schedule.

11/20/43 Marines of the 2nd Division land on Tarawa, first step in the capture of the Central Pacific islands. The violent and sustained opposition of the Japanese to this landing despite the heavy pre-landing air and naval bombardment gave an indication of what was to come in future amphibious assaults. Makin is also invaded, and all islands were secured by 11/28/43.

11/24/43 American escort carrier LISCOME BAY is sunk by a Japanese submarine with heavy loss of life while covering the Tarawa operations. This loss, and damage to carrier INDEPENDENCE, leads to changes in how aircraft carriers were used to cover invasions.

1/29/44 U.S. carrier task forces commence heavy attacks on the Marshall islands group, preparatory to invasion. The intent of these raids was to eliminate Japanese airpower and shipping in the area as well as damaging shore

defense installations, a pattern that would be repeated in all Central Pacific amphibious assaults.

- 1/31/44 U.S. forces invade Kwajalein in the Marshall islands.
- 2/4/44 Kwajalein is declared secured. Japanese losses in the fighting were almost 5,000 men. U.S. forces rapidly build airfields and advanced naval facilities throughout the Gilberts and Marshalls which serve as staging areas for future assaults in the Pacific.
- 2/10/44 The Imperial Japanese Navy decides to abandon Truk as a major forward fleet base, as the capture of the Gilberts and Marshalls by U.S. forces makes Truk extremely vulnerable to attack. Truk maintains the large land-based air units in the area, but all major Japanese warships retreated to Palau.
- 2/16-18/44 U.S. naval forces headed by 9 fleet carriers and 6 new battleships strike Truk in the first step of Operation Hailstone, a sweep of the Central Pacific islands aimed at destroying as much of the facilities, shipping and airpower in the area as possible in preparation for possible future invasion. Over 200,000 tons of Japanese merchant and naval shipping were lost at Truk in this attack.
- 2/17/44 U.S. forces occupy Eniwetok Atoll with stiff resistance.
- 2/19/44 Army and Marine units capture Engebi Island, Eniwetok, overcoming fierce resistance.
- 2/21/44 Eniwetok is secured and work begins immediately on building an advanced naval base. Eniwetok served throughout the remainder of the war as a forward base for naval and air forces.
- 2/22/44 Japanese aircraft attack Task Force 58 (the fast carrier force) en route to the Marianas. No American ships were damaged and Japanese plane losses were heavy.
- 2/23/44 TF-58 commences heavy air strikes on Saipan, Tinian, Rota and Guam in the Marianas.

3/30-4/2/44 TF-58 commences heavy airstrikes on the western Carolines, concentrating on Palau, Yap, and Ulithi. Over 100,000 tons of Japanese naval and merchant shipping were destroyed, along with well over 150 aircraft. The major units of the Japanese Navy had already retreated to Borneo and Lingga Roads, near Singapore.

3/31/44 Adm. Mineichi Koga, Commander in Chief of the Combined Fleet, is killed when his plane disappears in a violent storm between Palau and the Philippines. Adm. Soemu Toyoda assumes command.

4/29-30/44 TF-58 hits Truk again, this time aiming at doing as much damage to base facilities as possible. Truk was so effectively neutralized by this and previous attacks that invasion and capture became unnecessary and Truk was by-passed by American forces, finally surrendering at the end of the war.

5/1/44 TF-58 battleships bombard Ponape island in conjunction with carrier air strikes.

5/20/44 Naval aircraft strike Marcus Island.

5/24/44 Naval aircraft strike Wake Island.

6/10/44 U.S. naval forces commence pre-invasion attacks on the Marianas, bombarding Saipan, Guam and Tinian, destroying most of the remaining land-based airpower and damaging facilities and defenses on all three islands.

6/15/44 U.S. 2nd and 4th Marine Division troops land on Saipan, securing a five-mile wide beachhead against some 17,000 defenders. On the same day, part of TF-58 strikes Iwo Jima and the Bonins to prevent Japanese reinforcements from reaching the Marianas.

6/19-20/44 Battle of the Philippine Sea. TF-58 engages the nine remaining Japanese aircraft carriers. In two days the Japanese lose over 470 aircraft and 3 aircraft carriers (2 to submarines). Japanese naval airpower in the traditional sense is eliminated for the remainder of the war and the Marianas remained secure from attack.

6/30/44 Vice Adm. Chuichi Nagumo, once commander of the Pearl Harbor attack force, commits suicide on Saipan. Admiral Nagumo had been relieved of sea command after the Battle of Midway and the Solomons battles. Before his death he saw several of the battleships he had sunk at Pearl Harbor firing at positions on Saipan.

7/2/44 Iwo Jima and the Bonin Islands are again attacked by naval forces.

7/8/44 Guam bombarded by U.S. naval warships in the first installment of day and night bombardment until the island was invaded on the 21st.

7/9/44 Saipan is declared secure. The Japanese garrison of some 27,000 troops was decimated and many thousands of civilians were killed or committed suicide.

7/18/44 The announcement of the capture of Saipan in Japan causes the fall of the government. Lt. Gen. Hideki Tojo, Premier, War Minister and Army Chief of Staff, resigns in disgrace. The new government publically vows to continue the fight--primarily because to do otherwise risked assassination by the Army--while privately seeking a way out of the war.

7/21/44 3rd Marine Division, 1st Marine Brigade and 77th Army Division troops land on Guam against stiff resistance.

7/24/44 Two Marine Divisions land on Tinian from Saipan. the island was secured in about 9 days with over 5,000 Japanese killed.

8/10/44 Japanese resistance on Guam ends after at least 10,000 defenders are killed.

9/3/44 Wake Island again attacked by U.S. naval units.

9/6/44 The U.S. fast carrier task force, now comprising some 16 heavy and light carriers commences strikes against Palau, Yap and Ulithi, first of a series of strikes preparatory to invasion.

9/15/44 U.S. Marines land on Peliliu Island in the Palau group following a three-day bombardment by ships and aircraft. The fight for Peleliu

was as tough as any in the Pacific war because of terrain, climate and the well dug in defenders most ably led by Col. Nakagawa Gen Murai.

9/20/44

Angaur Island in the Palaus is invaded by troops of the 88th Army Division and secured by U.S. troops after a bloody fight.

10/14/44

Peliliu is declared secure, although this was probably more bravado than fact, as the Japanese were still fighting into November. With the collapse of the defense of Palau, the war in the Central Pacific came to a close, and the Pacific Ocean area was completely under American control. The American bases in the Central Pacific continue to serve as support bases for the rest of the wartime operations in the Philippines, Iwo Jima, Okinawa and the Japanese home islands. Bypassed Japanese island bases in the Pacific all surrendered to American forces at the end of the war.

ABOUT THE AUTHORS AND CONTRIBUTORS

DENNIS BLANKENBACKER: Dennis is the newest member of the War in the Pacific National Historical Park's (WAPA's) Submerged Research Team. He has worked on projects in Guam and Saipan. He is a commercial pilot with a major airline and an aircraft mechanic.

DON BOYER: Don has been an avid student of U.S. Naval history for more than 30 years, with a particular interest in World War II in the Pacific. As a military dependent, college student, and gunner's mate in the U.S. Navy during the Vietnam War, Don lived in the Pacific Ocean area for 14 years, living in and visiting many of the areas which were critical battle areas during the war including Hawaii, Guam, Saipan, Tinian, Palau, Kwajalein and Japan. Don currently works for the Bureau of Land Management as a printing specialist and editor and lives in Santa Fe, New Mexico, with his wife and son.

TONI L. CARRELL: Toni has worked on projects ranging from a study of the effects of submergence on terrestrial archeological sites in reservoirs to inventories of shipwrecks throughout the U.S. and the former Trust Territories. She has authored or contributed to five of the eight Submerged Cultural Resources Unit (SCRU) publications. In February 1990, Toni left the National Park Service (NPS) and accepted a position with Ships of Discovery in Dallas, Texas. She is presently pursuing a Ph.D. in Maritime Archeology at the University of St. Andrews, Scotland.

WILLIAM COOPER: A diver for more than 15 years, Bill has been the chief volunteer diver with the WAPA's Submerged Research Team for 3 years. His research work includes sites on Guam and Saipan. He has also contributed the graphic illustrations for the Saipan section of this report. His diving interests include the surveying and preservation of underwater sites. Bill is a commercial pilot with a major airline.

RICHARD DAVIS: He has served as the Territorial Archaeologist for Guam since 1983, and the Deputy Guam Historic Preservation Officer since 1987. His cultural resource management experience includes work with federal agencies and in nonprofit archeological research organizations.

MARJORIE G. DRIVER: By now Marjorie is one of Guam's longtime residents, having settled there in the 1950s. Her early years were spent in a sister territory, Puerto Rico, where she learned Spanish as a young child. After graduation from Russell Sage and Middlebury Colleges, and before going to Guam, she was a high school teacher of Spanish and history in Connecticut and New York states. In 1967 she was appointed to the University of Guam as one of the founding members of the Micronesian Area Research Center (MARC) faculty, where she has been since. During her many years at MARC, she has served in administrative and research positions. For the past 10 years, she has been in charge of Spanish documents collection and has published several booklets and numerous articles pertaining to the history of Guam and the Marianas, several of which have focused on maritime activities in the islands.

KEVIN FOSTER: Kevin is a former historian with the National Maritime Initiative. In 1988 he participated in Project SeaMark field operations in Palau. He has contributed to the discussions of World War II sites on Pelileu and Malakal Harbor.

SUZANNE HENDRICKS: Suzanne has been a volunteer with the WAPA team since 1983. She assisted the SCRUI team on documentation of the USS ARIZONA in Pearl Harbor and as such was the first female to dive at this site. She served as a volunteer in the 1984 Saipan assessment. In 1985, she participated in the techniques of underwater archeology. As a diver for over 20 years, she has assisted WAPA in all major projects relating to submerged cultural resources inventory and surveys. She is an avid supporter in the preservation of our natural and cultural resources.

DANIEL J. LENIHAN: Chief of SCRUI since its inception in 1980, Dan has supervised most of the on-site operations of the unit in Micronesia. Before 1980, Dan ran the 5-year National Reservoir Inundation Study for NPS. He is also an avid sport diver having been certified as an instructor for the National Association of Underwater Instructors in 1972 and a cave diving instructor in 1973 while completing his master's degree in anthropology at Florida State University.

DAVID T. LOTZ: Dave is a twenty-one year resident of Guam who has contributed to numerous preservation and park projects in Guam including researching archival records on World War II shipwrecks on Guam, assisting in the creation of the WAPA, and establishing the Guam historic preservation program. A WAPA historian, Dave has visited and researched many battle remnants in Guam and the Mariana Islands. Since 1984, he has been the Parks Administrator for the Guam

Department of Parks and Recreation while for several years, along with his wife Beverly, they have been writing a hiking column "Making Tracks" in the Pacific Daily News.

THOMAS B. McGRATH: Thomas B. McGrath, S.J., is an associate professor of anthropology at the Micronesian Area Research Center of the University of Guam. His interests include the ethnohistory of Guam and Micronesia, the whalers in the Marianas, and the Capuchins in Guam. He is a member of the Naval Reserve and also sailed on the Micronesian canoe Tipiew within the Marianas in the spring of 1988.

ROSE S.N. MANIBUSAN: A diver since 1983, Rose has been involved with many projects in Micronesia. She served as Assistant Park Dive Officer for 6 years with WAPA. In January 1990, Rose accepted a fire management position in the Western Regional Office in San Francisco, California. She returned to WAPA in 1991 as Chief Ranger.

JAMES E. MICULKA: Jim has been Chief Ranger for the WAPA and Dive Officer for the park's Submerged Research Team since 1980. He has been diving for nearly 20 years. He has been involved with projects on the USS ARIZONA in Hawaii, research work in Scotland and various projects in Micronesia. In September 1990, James accepted a Chief Ranger position with Jean Lafitte National Historical Park in New Orleans, Louisiana. He holds an MSc in International Resource Management from the University of Edinburgh, Edinburgh, Scotland.

TIM ROCK: Tim has been living on Guam since 1981 and has been an active park service volunteer during those years. He has produced video and still productions for the WAPA and worked with SCRU. Tim is photojournalist specializing in the realm of the ocean and is also an experienced documentary photographer.

EDWARD WOOD: Ed has been the Ranger-in-Charge of American Memorial Park since January 1989. He has 17 years of experience with NPS and has worked in five areas. He has been involved with underwater research activities in Guam and Saipan. His hobbies include computers, ham radio, diving and music (piano and guitar).

**SUBMERGED CULTURAL RESOURCES UNIT
REPORT AND PUBLICATION SERIES**

The Submerged Cultural Resources Unit was established in 1980 to conduct research on submerged cultural resources throughout the National Park System with an emphasis on historic shipwrecks. One of the unit's primary responsibilities is to disseminate the results of research to National Park Service managers, as well as the professional community, in a form that meets resource management needs and adds to our understanding of the resource base. A report series has been initiated in order to fulfill this responsibility. The following are the categories of reports that comprise this series.

Submerged Cultural Resources Assessment

First line document that consists of a brief literature search, an overview of the maritime history and the known or potential underwater sites in the park, and preliminary recommendations for long-term management. It is designed to have application to GMP/DCP's and to become a source document for a park's Submerged Cultural Resources Management Plan.

Submerged Cultural Resources Survey

Comprehensive examination of blocks of park lands for the purpose of locating and indentifying as much of the submerged cultural resources base as possible. A comprehensive literature search would most likely be a part of the Phase I report but, in some cases, may be postponed until Phase II.

Phase I -- Reconnaissance of target areas with remote sensing and visual survey techniques to establish location of any archeological sites or anomalous features that may suggest the presence of archeological sites.

Phase II -- Evaluation of archeological sites or anomalous features derived from remote sensing instruments to confirm their nature, and if possible, their significance. This may involve exploratory removal of overburden.

Submerged Cultural Resources Study

A document that discusses, in detail, all known underwater archeological sites in a given park. This may involve test excavations. The intended audience is managerial and professional, not the general public.

Submerged Cultural Resources Site Report

Exhaustive documentation of one archeological site which may involve a partial or complete site excavation. The intended audience is primarily professional and incidentally managerial. Although the document may be useful to a park's interpretive specialists because of its information content, it would probably not be suitable for general distribution to park visitors.

Submerged Cultural Resources Special Report Series

These may be in published or photocopy format. Included are special commentaries, papers on methodological or technical issues pertinent to underwater archeology, or any miscellaneous report that does not appropriately fit into one of the other categories.

Daniel J. Lenihan

PUBLISHED REPORTS
OF THE
SOUTHWEST CULTURAL RESOURCES CENTER

1. Larry E. Murphy, Editor. Submerged Cultural Resources Survey: Portions of Point Reyes National Seashore and Point Reyes-Farallon Islands National Marine Sanctuary. Submerged Cultural Resources Unit, 1984.
2. Toni Carrell. Submerged Cultural Resources Inventory: Portions of Point Reyes National Seashore and Point Reyes-Farallon Islands National Marine Sanctuary. Submerged Cultural Resources Unit, 1984
3. Edwin C. Bearss. Resource Study: Lyndon B. Johnson and the Hill Country, 1937-1963. Division of Conservation, 1984.
4. Edwin C. Bearss. Historic Structures Report: Texas White House. Division of Conservation, 1986.
5. Barbara Holmes. Historic Resource Study of the Barataria Unit of Jean Lafitte National Historical Park. Division of History, 1986.
6. Steven M. Burke and Marlys Bush-Thurber. Southwest Region Headquarters Building, Santa Fe, New Mexico: A Historic Structure Report. Division of Conservation, 1985.
7. Toni Carrell. Submerged Cultural Resources Site Report: NOQUEBAY, Apostle Islands National Lakeshore. Submerged Cultural Resources Unit, 1985.
8. Daniel J. Lenihan, Editor. Submerged Cultural Resources Study: Isle Royale National Park. Submerged Cultural Resources Unit, 1987.
9. J. Richard Ambler. Archeological Assessment: Navajo National Monument. Division of Anthropology, 1985.
10. John S. Speaker, Joanna Chase, Carol Poplin, Herschel Franks, R. Christopher Goodwin. Archeological Assessment: Barataria Unit, Jean Lafitte National Historical Park. Division of Anthropology, 1986.

11. James E. Ivey, Marlys Bush-Thurber, James T. Escobedo Jr., Tom Ireland. The Missions of San Antonio: A Historic Structures Report and Administrative History. Divisions of Conservation and History, 1987.
12. Roger E. Coleman. The Arkansas Post Story. Division of History, 1987.
13. Toni Carrell, Editor. Submerged Cultural Resources Site Report: Charles H. Spencer Mining Operation and Paddle Wheel Steamboat, Glen Canyon National Recreation Area. Submerged Cultural Resources Unit, 1987.
14. Hal Rothman. The Bandelier National Monument: An Administrative History. Division of History, 1988.
15. James E. Ivey. In the Mist of A Loneliness. Division of History, 1988.
16. Richard W. Sellars and Melody Webb. An Interview with Robert M. Utley on The History of Historic Preservation in the National Park Service--1947-1980. Santa Fe, 1988.
17. Laura S. Harrison and Beverley Spears, Historic Structures Report, Chinle Trading Post, Thunderbird Ranch and Custodian's Residence. Division of History, 1988.
18. James P. Delgado and Stephen A. Haller. Submerged Cultural Resources Assessment: Golden Gate National Recreation Area, Gulf of the Farallones National Marine Sanctuary and Point Reyes National Seashore, 1989.
19. Judith K. Fabry. Guadalupe Mountains National Park: An Administrative History. Division of History, 1988.
20. Peter J. McKenna and Scott E. Travis. Archeological Investigations at Thunderbird Lodge. Division of Anthropology, 1989.
21. Peter J. McKenna and James E. Bradford. The T. J. Ruin, Gila Cliff Dwellings. Division of Anthropology, 1989.
22. C. Patrick Labadie. Submerged Cultural Resources Study: Pictured Rocks National Lakeshore. Submerged Cultural Resources Unit, 1989.
23. Daniel J. Lenihan, Editor. Submerged Cultural Resources Study: USS Arizona Memorial and Pearl Harbor National

- Historic Landmark. Submerged Cultural Resources Unit, 1989.
24. Robert H. and Florence P. Lister. Aztec Ruins National Monument: Administrative History of an Archeological Preserve, 1990.
 25. Jill-Karen Yakubik. Archeological Investigations of Six Spanish Colonial Period Sites: Barataria Unit, Jean Lafitte National Historical Park and Preserve. Division of Anthropology, 1989.
 26. Herschel A. Franks and Jill-Karen Yakubik. Archaeological Survey on 65 Acres of Land Adjacent to Bayou des Familles: Barataria Unit, Jean Lafitte National Historical Park and Preserve. Division of Anthropology, 1989.
 27. Walter K. Wait and Peter J. McKenna. Quarai Parking Lot Rehabilitation: Archeological Testing Program. Salinas National Monument, 1990.
 28. Diane Taylor, Lyndi Hubbel, Nancy Wood and Barbara Fielder. The 1977 La Mesa Fire Study: An Investigation of Fire and Fire Suppression Impact on Cultural Resources in Bandelier National Monument. Division of Anthropology, 1990.
 29. Wesley R. Hurt. The 1939-1940 Excavation Project at Quarai Pueblo and Mission Buildings. Salinas Pueblo Missions National Monument, Division of Anthropology, 1990.
 30. Roger E. Coleman. Archeological Investigation for Construction of a Pedestrian Trail and Identification of Laundress Row. Division of Anthropology, 1990.
 31. James E. Ivey. Presidos of the Big Bend Area. Bilingual publication, English and Spanish. Division of History, 1990.
 32. Neil C. Mangum. In the Land of Frozen Fires: A History of Occupation of El Malpais Country. Division of History, 1990.
 33. Jack B. Bertram. Archeological Investigations Along the Proposed Alibates Tour Road Improvement Construction Route Alibates Flint Quarries National Monument, Potter County, Texas. Division of Anthropology, 1990.
 34. Robert Wooster, Ph.D. History of Fort Davis, Texas. Division of History, 1990.

35. Bruce A. Anderson. The Wupatki Archeological Inventory Survey Project: Final Report. Division of Anthropology, 1990.
36. Toni L. Carrell. Submerged Cultural Resources Assessment of Micronesia. Submerged Cultural Resources Unit, 1991.
37. James P. Delgado, Daniel J. Lenihan and Larry Murphy. The Archeology of the Atomic Bomb: A Submerged Cultural Resources Assessment of the Sunken Fleet of Operation Crossroads at Bikini and Kwajalein Atoll Lagoons, Republic of the Marshall Islands. Submerged Cultural Resources Unit, 1991.
38. George Sabo III, Randall L. Guendling, W. Fredrick Limp, Margaret J. Guccione, Susan L. Scott, Gayle J. Fritz, Pamela A. Smith. Archeological Investigations at 3MR80-Area D in the Rush Development Area, Buffalo National River, Arkansas, Division of Anthropology, 1990.
39. Larry E. Murphy. 8SL17: Natural Site-Formation Processes of a Multiple-Component Underwater Site in Florida. Submerged Cultural Resources Unit, 1990.

Mission: As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally-owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration.

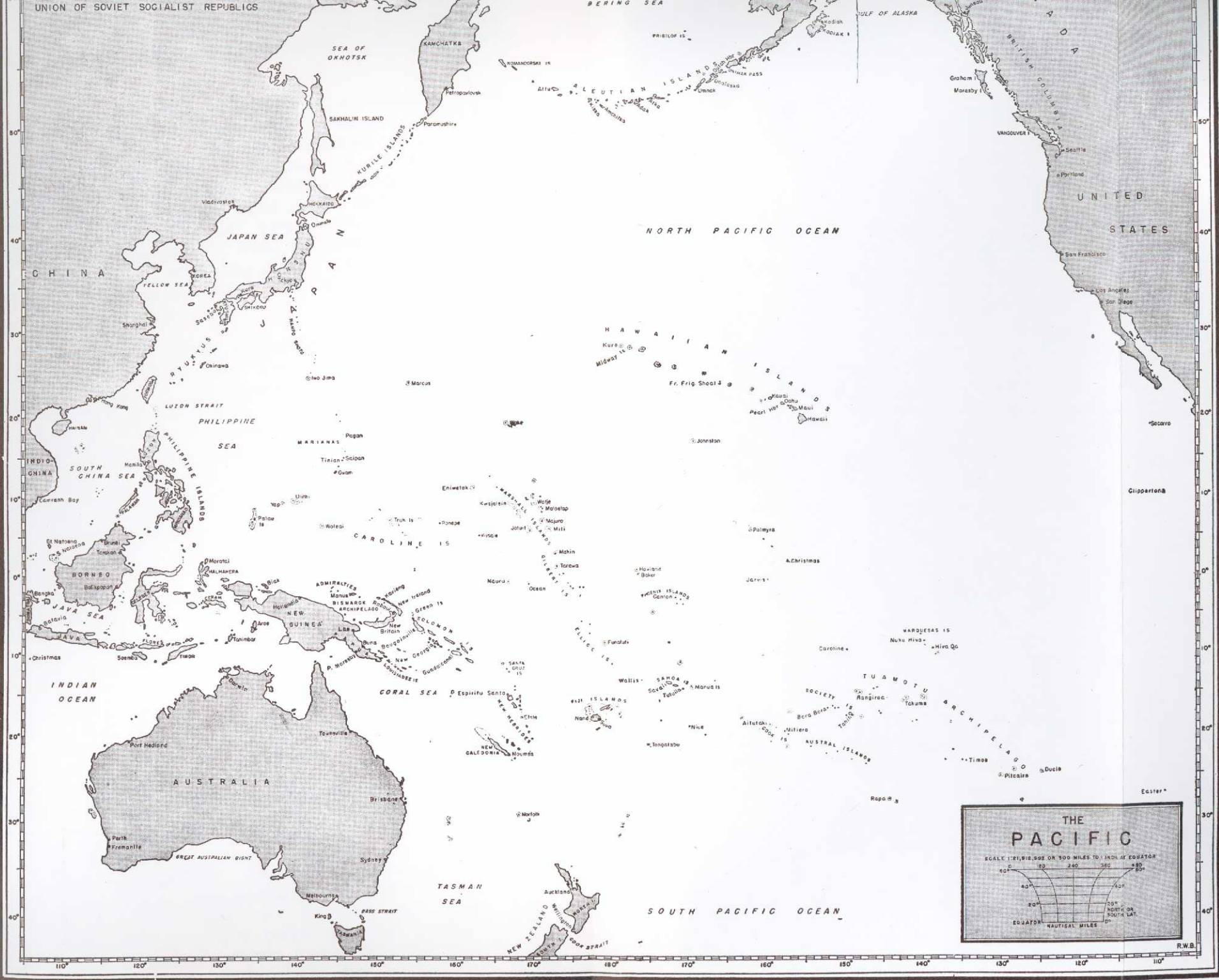


Fig. 2-1 Pacific Basin.